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The U.S. Tsunami Program Reauthorization in P.L. 115-25: Section-by-Section Comparison to P.L. 109-479, Title VIII

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Summary

The National Oceanic and Atmospheric Administration's (NOAA's) National Weather Service (NWS) manages two tsunami warning centers, which monitor, detect, and issue warnings for tsunamis. The NWS operates the Pacific Tsunami Warning Center (PTWC) at Ford Island, HI, and the National Tsunami Warning Center (NTWC) at Palmer, AK. The tsunami warning centers monitor and evaluate data from seismic networks and determine if a tsunami is likely based on the location, magnitude, and depth of an earthquake. The centers monitor relevant water-level data, typically with tide-level gauges, and data from NOAA's network of Deep-Ocean Assessment and Reporting of Tsunami (DART) detection buoys to confirm that a tsunami has been generated or to cancel any warnings if no tsunami is detected.

In the 114th Congress, the House passed legislation amending U.S. tsunami activities (H.R. 34) and the Senate passed similar legislation (Title V of H.R. 1561). However, the 114th Congress did not enact a final version of the legislation.

The 115th Congress passed the Tsunami Warning, Education, and Research Act of 2017 as Title V of P.L. 115-25 on April 4, 2017. The bill was signed into law on April 18, 2017. Title V of P.L. 115-25 amended P.L. 109-479, Title VIII, the Tsunami Warning and Education Act, which was enacted on January 12, 2007. The new law does not make fundamental changes to the federal government's tsunami activities, which include tsunami forecasting and warning, mitigation, and research, as well as other tsunami-related activities. However, it does broaden the purposes of the federal activities, increasing focus on tsunami research, promoting community resilience to tsunami hazards, and refining requirements for standards and guidelines to improve education and outreach activities as well as tsunami mapping and modeling. The new law authorizes appropriations of \$25.8 million per year from FY2016 through FY2021.

An ongoing question for the U.S. tsunami program and related activities is whether Congress will appropriate funds matching the amounts authorized in P.L. 115-25 for NOAA to carry out the tsunami program. Another challenge is how Congress should evaluate the effectiveness of the program. Because Title V of P.L. 115-25 adds an emphasis on research, a future question is how well research results are incorporated into tsunami resilience, education, warning, and other activities. More generally, if a large and damaging tsunami were to strike the United States, an additional challenge for Congress would be to sort out how effective the program was at reducing the amount of damage and the number of injuries and fatalities.

This report compares the enacted legislation text with P.L. 109-479, Title VIII, section by section, with brief comments on selected comparisons about how changes in P.L. 115-25, Title V, affect P.L. 109-479, Title VIII, and the authorized tsunami activities.

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Introduction

Congress has expressed interest in federal programs and activities addressing tsunami detection, warning, research, education, and outreach because of the tsunami hazard to the United States, particularly to Pacific Northwest, Northern California, Alaska, and Hawaii, as well as regions of the Caribbean and Atlantic coastline. The Japanese tsunami of March 11, 2011, illustrated the potential for damage and loss of life posed by a potential tsunami in the Pacific. A fault system off the northwestern United States, called the Cascadia Subduction Zone, is similar to the fault system responsible for the 2011 Japanese tsunami disaster. Oregon, Washington, Northern California, Hawaii, and Alaska all face some risk if the Cascadia fault ruptures.

Congress passed the Tsunami Warning, Education, and Research Act of 2017 as Title V of P.L. 115-25, on April 4, 2017; President Trump signed the bill into law as P.L. 115-25 on April 18, 2017. Title V of P.L. 115-25 amends P.L. 109-479, Title VIII, the Tsunami Warning and Education Act, which was enacted on January 12, 2007. The new law does not make fundamental changes to the federal government's tsunami activities, which include tsunami forecasting and warning, mitigation, and research, as well as other tsunami-related activities. However, it does broaden the purposes of the federal activities, increasing focus on tsunami research, promoting community resilience to tsunami hazards, and refining requirements for standards and guidelines to improve education and outreach activities and tsunami mapping and modeling. The new law authorizes appropriations of \$25.8 million per year for FY2016 through FY2021.

An ongoing question for the U.S. tsunami program and related activities is whether Congress will appropriate funds matching the amounts authorized in P.L. 115-25 to carry out the existing program as well as the new activities and priorities in the law. Another challenge is how Congress should evaluate the effectiveness of the program. A perennial issue for NOAA is keeping its constellation of Deep-Ocean Assessment and Reporting of Tsunami (DART) buoys operational, and the new law specifies a goal of keeping at least 80% of the buoy system operational at all times. More generally, because Title V of P.L. 115-25 adds an emphasis on research throughout the program, a future question is how well research results are incorporated into tsunami resilience, education, warning, and other activities. Also, damaging tsunami events are relatively rare for the United States, so it is difficult to assess the overall effect of tsunami program activities on an annual basis. If a large and damaging tsunami were to strike the United States, an additional challenge for Congress would be to sort out how effective the program was at reducing the amount of damage and the number of injuries and fatalities.

In addition, the bill repeals P.L. 109-424, the Tsunami Warning and Education Act, also passed by the 109th Congress. P.L. 109-424 was signed into law by President George W. Bush on December 20, 2006, and is nearly identical to P.L. 109-479. P.L. 115-25 removes any potential for ambiguity by repealing one of the existing laws.

This report provides a section-by-section comparison of text quoted from P.L. 115-25 and P.L. 109-479, shown in **Table 1**, with some brief comments from the Congressional Research Service (CRS) pointing out selected changes and how those changes affect P.L. 109-479 and the tsunami activities it authorized (far right column of **Table 1**). The table is organized so that the same or most similar sections, and parts of sections, are in the same row or rows. The CRS comments generally address the sections or parts of sections in the same row of the table.

Table I. Comparison of P.L. 109-479, Title VIII, the Tsunami Warning and Education Act, with P.L. 115-25, Title V

(with selected comments by CRS)

Section	P.L. 109-479, Title VIII	Section	P.L. 115-25, Title V	CRS Comments (effect of P.L. 115-25 on P.L. 109-479 and activities it authorized)
801	SHORT TITLE. Tsunami Warning and Education Act	501	SHORT TITLE. Tsunami Warning, Education, and Research Act of 2017	Adds emphasis on research to the tsunami program.
		502	REFERENCES TO THE TSUNAMI WARNING AND EDUCATION ACT. Except as otherwise expressly provided, whenever in this title an amendment or repeal is expressed in terms of an amendment to, or repeal of, a section or other provision, the reference shall be considered to be made to a section or other provision of the Tsunami Warning and Education Act enacted as title VIII of the Magnuson-Stevens Fishery Conservation and Management Reauthorization Act of 2006 (Public Law 109-479; 33 U.S.C. 3201 et seq.).	Clarifies that P.L. 115-25 amends P.L. 109-479, Title VIII, and does not amend P.L. 109-424, which the 109 th Congress also passed. The 109 th Congress passed two separate and nearly identical bills addressing the tsunami program. Section 512 of P.L. 115-25 repeals P.L. 109-424.
802	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.			Does not amend definitions.
803	PURPOSES. The purposes of this title are— (1) to improve tsunami detection, forecasting, warnings, notification, outreach, and mitigation to protect life and property in the United States;	503	EXPANSION OF PURPOSES OF TSUNAMI WARNING AND EDUCATION ACT. Section 803 (33 U.S.C. 3202) is amended— (1) in paragraph (1), by inserting “research,” after “warnings,”;	Adds emphasis on research.
803 (con’t)	(2) to enhance and modernize the existing Pacific Tsunami Warning System to increase coverage, reduce false alarms, and increase the accuracy of forecasts and warnings, and to expand detection and warning systems to include other	503 (con’t)	(2) by amending paragraph (2) to read as follows: “(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	Refers to the United States more broadly, rather than the Pacific Tsunami Warning System specifically, and adds the purpose of reducing false alarms.

Section	P.L. 109-479, Title VIII	Section	P.L. 115-25, Title V	CRS Comments (effect of P.L. 115-25 on P.L. 109-479 and activities it authorized)
	vulnerable States and United States territories, including the Atlantic Ocean, Caribbean Sea, and Gulf of Mexico areas;		threats to the United States with a network of detection assets, and to reduce false alarms”;	
803 (con’t)	(3) to improve mapping, modeling, research, and assessment efforts to improve tsunami detection, forecasting, warnings, notification, outreach, mitigation, response, and recovery;	503 (con’t)	“(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”;	Broadens the purpose to include standards and guidelines for mapping and modeling. Adds the term <i>resiliency</i> as one aspect to improve among the others.
803 (con’t)		503 (con’t)	(4) by redesignating paragraphs (4), (5), and (6) as paragraphs (5), (6), and (8), respectively; (5) by inserting after paragraph (3) the following: “(4) to improve research efforts related to improving tsunami detection, forecasting, warnings, notification, mitigation, resiliency, response, outreach, and recovery”;	Adds a new subparagraph to emphasize research efforts to improve all the cited aspects of dealing with tsunamis.
803 (con’t)	(4) to improve and increase 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;	503 (con’t)	(6) in paragraph (5), as redesignated— (A) by striking “and increase” and inserting “, increase, and develop uniform standards and guidelines for”; and (B) by inserting “, including the warning signs of locally generated tsunami” after “approaching”;	Adds language on developing uniform standards and guidelines for education and outreach activities. Adds language that includes making the public aware of warning signs of locally generated tsunami.
803 (con’t)	(5) to provide technical and other assistance to speed international efforts to establish regional tsunami warning systems in vulnerable areas worldwide, including the Indian Ocean; and	503 (con’t)	(7) in paragraph (6), as redesignated, by striking “, including the Indian Ocean; and” and inserting a semicolon; and	Excludes the Indian Ocean.
803 (con’t)	(6) to improve Federal, State, and international coordination for detection, warnings, and outreach for tsunami and other coastal impacts.	503 (con’t)	(8) by inserting after paragraph (6), as redesignated, the following: “(7) to foster resilient communities in the face of tsunami and other similar coastal hazards.”	Adds language to foster resilient communities for tsunamis and other coastal hazards, in addition to improving federal, state, and international coordination.
804	TSUNAMI FORECASTING AND WARNING PROGRAM. (a) In General—The Administrator, through the National Weather Service and in consultation with other relevant	504	MODIFICATION OF TSUNAMI FORECASTING AND WARNING PROGRAM.	

Section	P.L. 109-479, Title VIII	Section	P.L. 115-25, Title V	CRS Comments (effect of P.L. 115-25 on P.L. 109-479 and activities it authorized)
	<p>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, Caribbean Sea, and Gulf of Mexico region.</p> <p>(b) Components—The program under this section shall— (1) include the tsunami warning centers established under subsection (d);</p>		<p>(a) In General—Subsection (a) of section 804 (33 U.S.C. 3203(a)) is amended by striking “Atlantic Ocean, Caribbean Sea, and Gulf of Mexico region” and inserting “Atlantic Ocean region, including the Caribbean Sea and the Gulf of Mexico.”</p> <p>(b) Components—Subsection (b) of section 804 (33 U.S.C. 3203(b)) is amended— (1) in paragraph (1), by striking “established” and inserting “supported or maintained”; (2) by redesignating paragraphs (7) through (9) as paragraphs (8) through (10), respectively; (3) by redesignating paragraphs (2) through (6) as paragraphs (3) through (7), respectively;</p>	
804 (con’t)		504 (con’t)	(4) by inserting after paragraph (1) the following: “(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”;	Puts a specific threshold—80%—as the operational capacity requirement for DART buoys.
804 (con’t)	(2) utilize and maintain an array of robust tsunami detection technologies; (3) maintain detection equipment in operational condition to fulfill the detection, forecasting, and warning requirements of this title;	504 (con’t)		
804 (con’t)	(4) provide tsunami forecasting capability based on models and measurements, including tsunami inundation models and maps for use in increasing the preparedness of communities, including through the TsunamiReady program;	504 (con’t)	(5) by amending paragraph (5), as redesignated by paragraph (3), to read as follows: “(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;	Expands the requirements for tsunami forecasting and warning and lists seven specific systems, networks, and data sources in subparagraphs A through G, the inputs from which should be incorporated into providing tsunami forecasting capability.

Section	P.L. 109-479, Title VIII	Section	P.L. 115-25, Title V	CRS Comments (effect of P.L. 115-25 on P.L. 109-479 and activities it authorized)
			“(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”;	
804 (con’t)	(5) maintain data quality and management systems to support the requirements of the program;	504 (con’t)		
804 (con’t)	(6) include a cooperative effort among the Administration, the United States Geological Survey, and the National Science Foundation under which the Geological Survey and the National Science Foundation shall provide rapid and reliable seismic information to the Administration from international and domestic seismic networks;	504 (con’t)	(6) by amending paragraph (7), as redesignated by paragraph (3), to read as follows: “(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”;	Adds language requiring that the cooperative effort between the USGS, NSF, and the Administration shall support seismic stations operating prior to enactment of P.L. 115-25 to supplement tsunami warning coverage.
804 (con’t)	(7) provide a capability for the dissemination of warnings to at-risk States 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;	504 (con’t)	(7) in paragraph (8), as redesignated by paragraph (2) (A) by inserting “, including graphical warning products,” after “warnings”; (B) by inserting “, territories,” after “States”; and (C) by inserting “and Wireless Emergency Alerts” after “Hazards Program”; and	Expands requirements for warnings to include graphical warning products; U.S. territories as well as states; and wireless emergency alerts in addition to NOAA Weather Radio alerts.

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804 (con't)	(8) allow, as practicable, for integration of tsunami detection technologies with other environmental observing technologies; and (9) include any technology the Administrator considers appropriate to fulfill the objectives of the program under this section.	504 (con't)	(8) in paragraph (9), as redesignated by paragraph (2) (A) by inserting “provide and” before “allow”; and (B) by inserting “and commercial and Federal undersea communications cables” after “observing technologies.”	Includes commercial undersea communication cables and federal government undersea communication cables as part of environmental observing technologies.
804 (con't)	(c) System Areas—The program under this section shall operate— (1) a Pacific tsunami warning system capable of forecasting tsunami anywhere in the Pacific and Arctic Ocean regions and providing adequate warnings; and (2) an Atlantic Ocean, Caribbean Sea, and Gulf of Mexico tsunami warning system capable of forecasting tsunami and providing adequate warnings in areas of the Atlantic Ocean, 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.	504 (con't)	(c) Tsunami Warning System—Subsection (c) of section 804 (33 U.S.C. 3203(c)) is amended to read as follows: “(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.”	Adds language to support international tsunami forecasting and warning efforts.
804 (con't)	(d) Tsunami Warning Centers— (1) In general—The Administrator, through the National Weather Service, shall maintain or establish— (A) a Pacific Tsunami Warning Center in Hawaii;	504 (con't)	(d) Tsunami Warning Centers—Subsection (d) of section 804 (33 U.S.C. 3203(d)) is amended to read as follows: “(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—	Renames the West Coast and Alaska Tsunami Warning Center the National Tsunami Warning Center and establishes that it is primarily responsible for Alaska and the continental United States.

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	<p>(B) a West Coast and Alaska Tsunami Warning Center in Alaska; and</p> <p>(C) any additional forecast and warning centers determined by the National Weather Service to be necessary.</p>		<p>“(A) the National Tsunami Warning Center, located in Alaska, which is primarily responsible for Alaska and the continental United States;</p> <p>“(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</p> <p>“(C) any additional forecast and warning centers determined by the National Weather Service to be necessary.</p>	<p>Clarifies that the Pacific Warning Center is responsible for Hawaii, the Caribbean, and other areas of the Pacific not covered by the National Center based in Alaska.</p>
804 (con’t)	<p>(2) Responsibilities—The responsibilities of each tsunami warning center shall include—</p> <p>(A) continuously monitoring data from seismological, deep ocean, and tidal monitoring stations;</p> <p>(B) evaluating earthquakes that have the potential to generate tsunami;</p> <p>(C) evaluating deep ocean buoy data and tidal monitoring stations for indications of tsunami resulting from earthquakes and other sources;</p> <p>(D) disseminating forecasts and tsunami warning bulletins to Federal, State, and local government officials and the public;</p> <p>(E) coordinating with the tsunami hazard mitigation program described in section 805 to ensure ongoing sharing of information between forecasters and emergency management officials; and</p> <p>(F) making data gathered under this title and post-warning analyses conducted by the National Weather Service or other relevant Administration offices available to researchers.</p>	504 (con’t)	<p>“(2) RESPONSIBILITIES—The responsibilities of the centers supported or maintained under paragraph (1) shall include the following:</p> <p>“(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.</p> <p>“(B) Evaluating earthquakes, landslides, and volcanic eruptions that have the potential to generate tsunami.</p> <p>“(C) Evaluating deep ocean buoy data and tidal monitoring stations for indications of tsunami resulting from earthquakes and other sources.</p> <p>“(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.</p> <p>“(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.</p> <p>“(F) Disseminating forecasts and tsunami warning bulletins to Federal, State, tribal, and local government officials and the public.</p> <p>“(G) Coordinating with the tsunami hazard mitigation program conducted under section 805 to ensure ongoing</p>	<p>Expands the responsibilities from 6 (A through F) to 10 (A through J).</p> <p>Expands the types of monitoring stations that should be continuously monitored.</p> <p>Adds landslides and volcanic eruptions to earthquakes as potential tsunami-causing events.</p> <p>Adds new responsibility (D) to use models to help predict tsunami and their effects.</p> <p>Adds new responsibility (E) to use data from the IOOS to calculate new tsunami inundation estimates.</p> <p>Adds new responsibility (H) to evaluate and recommend procedures for ports and harbors at risk from tsunami—in coordination with the Coast Guard and FEMA.</p> <p>Broadens the audience for data gathered by the program activities and post-warning analyses</p>

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			<p>sharing of information between forecasters and emergency management officials.</p> <p>“(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.</p> <p>“(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.</p> <p>“(J) Integrating and modernizing the program operated under this section with advances in tsunami science to improve performance without compromising service.</p>	<p>conducted by NWS to the public in addition to researchers (H).</p> <p>Adds new responsibility (J) to integrate the program with advances in tsunami science.</p>
804 (con’t)		504 (con’t)	<p>“(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.</p> <p>“(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—</p> <p>“(A) have the technical knowledge and capability to disseminate tsunami warnings for the communities they serve;</p> <p>“(B) leverage connections with local emergency management officials for optimally disseminating tsunami warnings and forecasts; and</p> <p>“(C) implement mass communication tools in effect on the day before the date of the enactment of the Tsunami</p>	<p>Requires tsunami warning centers to maintain a “fail-safe” capability and back each other up.</p> <p>Requires NOAA to coordinate with NWS and the tsunami warning centers so that NWS forecast offices improve the warnings and forecasts issued by those offices.</p> <p>Establishes uniform practices and procedures for the tsunami warning centers and the warning system generally; ensures that changes are made uniformly and consistently for the whole warning system; establishes a systematic method for information technology development; and disseminates</p>

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			<p>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.</p> <p>“(5) UNIFORM OPERATING PROCEDURES—The Administrator shall—</p> <p>“(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;</p> <p>“(B) ensure that processes and products of the warning system operated under subsection (c)—</p> <p>“(i) reflect industry best practices when practicable;</p> <p>“(ii) conform to the maximum extent practicable with internationally recognized standards for information technology; and</p> <p>“(iii) conform to the maximum extent practicable with other warning products and practices of the National Weather Service;</p> <p>“(C) ensure that future adjustments to operational protocols, processes, and warning products—</p> <p>“(i) are made consistently across the warning system operated under subsection (c); and</p> <p>“(ii) are applied in a uniform manner across such warning system;</p> <p>“(D) establish a systematic method for information technology product development to improve long-term technology planning efforts; and</p>	<p>guidelines and metrics for assessing tsunami forecast models.</p> <p>Requires that NWS make the resources available to implement the requirements of P.L. 115-25.</p>

Section	P.L. 109-479, Title VIII	Section	P.L. 115-25, Title V	CRS Comments (effect of P.L. 115-25 on P.L. 109-479 and activities it authorized)
			<p>“(E) disseminate guidelines and metrics for evaluating and improving tsunami forecast models.</p> <p>“(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).”</p>	
804 (con’t)	<p>(e) Transfer of Technology; Maintenance and Upgrades—</p> <p>(1) In general—In carrying out this section, the National Weather Service, in consultation with other relevant Administration offices, shall—</p> <p>(A) develop requirements for the equipment used to forecast tsunami, which shall include provisions for multipurpose detection platforms, reliability and performance metrics, and to the maximum extent practicable how the equipment will be integrated with other United States and global ocean and coastal observation systems, the global earth observing system of systems, global seismic networks, and the Advanced National Seismic System;</p> <p>(B) develop and execute a plan for the transfer of technology from ongoing research described in section 806 into the program under this section; and</p> <p>(C) ensure that maintaining operational tsunami detection equipment is the highest priority within the program carried out under this title.</p>	504 (con’t)	<p>(e) Transfer of Technology; Maintenance and Upgrades— Subsection (e) of section 804 (33 U.S.C. 3203(e)) is amended to read as follows:</p> <p>“(e) Transfer of Technology; Maintenance and Upgrades—In carrying out this section, the Administrator shall—</p> <p>“(1) develop requirements for the equipment used to forecast tsunami, including—</p> <p>“(A) provisions for multipurpose detection platforms;</p> <p>“(B) reliability and performance metrics; and</p> <p>“(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;</p> <p>“(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</p> <p>“(3) ensure that the Administration’s operational tsunami detection equipment is properly maintained.”</p>	
804 (con’t)	<p>(2) Report to congress—</p> <p>(A) Not later than 1 year after the date of enactment of this Act, the National Weather Service, in consultation with other relevant Administration offices, shall transmit to</p>	504 (con’t)		Omits requirement for report to Congress on how the tsunami warning system would integrate with other observations systems.

Section	P.L. 109-479, Title VIII	Section	P.L. 115-25, Title V	CRS Comments (effect of P.L. 115-25 on P.L. 109-479 and activities it authorized)
	<p>Congress a report on how the tsunami forecast system under this section will be integrated with other United States and global ocean and coastal observation systems, the global earth observing system of systems, global seismic networks, and the Advanced National Seismic System.</p> <p>(B) Not later than 3 years after the date of enactment of this Act, the National Weather Service, in consultation with other relevant Administration offices, shall transmit a report to Congress on how technology developed under section 806 is being transferred into the program under this section.</p>			<p>Omits requirement for report to Congress on how technology developed under the tsunami research program is transferred into operations.</p>
804 (con't)	<p>(f) Federal Cooperation—When deploying and maintaining tsunami detection technologies, the Administrator shall seek the assistance and assets of other appropriate Federal agencies.</p>	504 (con't)	<p>(f) Federal Cooperation—Subsection (f) of section 804 (33 U.S.C. 3203(f)) is amended to read as follows:</p> <p>“(f) Federal Cooperation—When deploying and maintaining tsunami detection technologies under the program under this section, the Administrator shall—</p> <p>“(1) identify which assets of other Federal agencies are necessary to support such program; and</p> <p>“(2) work with each agency identified under paragraph (1)—</p> <p>“(A) to acquire the agency’s assistance; and</p> <p>“(B) to prioritize the necessary assets in support of the tsunami forecast and warning program.”</p>	<p>Provides more explicit direction to NOAA for cooperating and working with other federal agencies in support of the program.</p>
804 (con't)	<p>(g) Annual Equipment Certification—At the same time Congress receives the budget justification documents in support of the President’s annual budget request for each fiscal year, the Administrator shall transmit to the Committee on Commerce, Science, and Transportation of the Senate and the Committee on Science of the House of Representatives a certification that—</p> <p>(1) identifies the tsunami detection equipment deployed pursuant to this title, as of December 31 of the preceding calendar year;</p>	504 (con't)	<p>(g) Unnecessary Provisions—Section 804 (33 U.S.C. 3203) is further amended—</p> <p>(1) by striking subsection (g);</p> <p>(2) by striking subsections (i) through (k); and</p>	<p>Omits the requirement for an annual equipment certification.</p>

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	<p>(2) certifies which equipment is operational as of December 31 of the preceding calendar year;</p> <p>(3) in the case of any piece of such equipment that is not operational as of such date, identifies that equipment and describes the mitigation strategy that is in place—(A) to repair or replace that piece of equipment within a reasonable period of time; or (B) to otherwise ensure adequate tsunami detection coverage;</p> <p>(4) identifies any equipment that is being developed or constructed to carry out this title but which has not yet been deployed, if the Administration has entered into a contract for that equipment prior to December 31 of the preceding calendar year, and provides a schedule for the deployment of that equipment; and</p> <p>(5) certifies that the Administrator expects the equipment described in paragraph (4) to meet the requirements, cost, and schedule provided in that contract.</p>			
804 (con't)	<p>(h) Congressional Notifications—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—</p> <p>(1) impaired regional forecasting capabilities due to equipment or system failures; and</p> <p>(2) significant contractor failures or delays in completing work associated with the tsunami forecasting and warning system.</p>	504 (con't)	<p>(3) by redesignating subsection (h) as subsection (g).</p> <p>(h) Congressional Notifications—Subsection (g) of section 804 (33 U.S.C. 3203(g)), as redesignated by subsection (g)(3), is amended—</p> <p>(1) by redesignating paragraphs (1) and (2) as subparagraphs (A) and (B), respectively, and moving such subparagraphs 2 ems to the right;</p> <p>(2) in the matter before subparagraph (A), as redesignated by paragraph (2), by striking “The Administrator” and inserting the following: “(1) IN GENERAL—The Administrator”;</p> <p>(3) in paragraph (1), as redesignated by paragraph (3)—</p> <p>(A) in subparagraph (A), as redesignated by paragraph (2), by striking “and” at the end;</p> <p>(B) in subparagraph (B), as redesignated by paragraph (2), by striking the period at the end and inserting “; and”; and</p>	Expands the congressional notification requirements, in the event of equipment or system failures or after the issuance of a significant tsunami warning, to include information and analysis about the accuracy of the tsunami model used, the equipment that detected the tsunami or did not detect it due to a malfunction or other reasons, the effectiveness of the tsunami warning, and any other findings.

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			<p>(C) by adding at the end the following: “(C) the occurrence of a significant tsunami warning.”; and</p> <p>(4) by adding at the end the following: “(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—</p> <p>“(A) the accuracy of the tsunami model used;</p> <p>“(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;</p> <p>“(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</p> <p>“(D) such other findings as the Administrator considers appropriate.”</p>	
804 (con’t)	<p>(i) Report—Not later than January 31, 2010, the Comptroller General of the United States shall transmit a report to the Committee on Commerce, Science, and Transportation of the Senate and the Committee on Science of the House of Representatives that—</p> <p>(1) evaluates the current status of the tsunami detection, forecasting, and warning system and the tsunami hazard mitigation program established under this title, including progress toward tsunami inundation mapping of all coastal areas vulnerable to tsunami and whether there has been any degradation of services as a result of the expansion of the program;</p> <p>(2) evaluates the National Weather Service’s ability to achieve continued improvements in the delivery of tsunami</p>	504 (con’t)		<p>Omits requirement for a GAO report on the tsunami detection, forecasting, and warning system and tsunami hazard mitigation program.</p> <p>Omits requirement for an external review of the program by the National Academy of Sciences.</p> <p>Omits requirement for NOAA to establish a process for monitoring and certifying contractor</p>

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	<p>detection, forecasting, and warning services by assessing policies and plans for the evolution of modernization systems, models, and computational abilities (including the adoption of new technologies); and</p> <p>(3) lists the contributions of funding or other resources to the program by other Federal agencies, particularly agencies participating in the program.</p> <p>(j) External Review—The Administrator shall enter into an arrangement with the National Academy of Sciences to review the tsunami detection, forecast, and warning program established under this title to assess further modernization and coverage needs, as well as long-term operational reliability issues, taking into account measures implemented under this title. The review shall also include an assessment of how well the forecast equipment has been integrated into other United States and global ocean and coastal observation systems and the global earth observing system of systems. Not later than 2 years after the date of enactment of this Act, the Administrator shall transmit a report containing the National Academy of Sciences' recommendations, the Administrator's responses to the recommendations, including those where the Administrator disagrees with the Academy, a timetable to implement the accepted recommendations, and the cost of implementing all the Academy's recommendations, to the Committee on Commerce, Science, and Transportation of the Senate and the Committee on Science of the House of Representatives.</p> <p>(k) Report—Not later than 3 months after the date of enactment of this Act, the Administrator shall establish a process for monitoring and certifying contractor performance in carrying out the requirements of any contract to construct or deploy tsunami detection equipment, including procedures and penalties to be</p>			<p>performance in constructing or deploying equipment.</p>

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	imposed in cases of significant contractor failure or negligence.			
805	<p>SEC. 805. NATIONAL TSUNAMI HAZARD MITIGATION PROGRAM.</p> <p>(a) In General—The Administrator, through the National Weather Service and in consultation with other relevant Administration offices, shall conduct a community-based tsunami hazard mitigation program to improve tsunami preparedness of at-risk areas in the United States and its territories.</p> <p>(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—</p> <p>(1) recommend how funds appropriated for carrying out the program under this section will be allocated;</p> <p>(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;</p> <p>(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</p> <p>(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.</p>	505	<p>SEC. 505. MODIFICATION OF NATIONAL TSUNAMI HAZARD MITIGATION PROGRAM.</p> <p>(a) In General—Section 805(a) (33 U.S.C. 3204(a)) is amended to read as follows:</p> <p>“(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.”</p>	<p>Requires NOAA to coordinate with FEMA, rather than NWS, to conduct a tsunami mitigation program. Broadens mandate to include improving community resilience as well as tsunami preparedness.</p> <p>Language authorizing the coordinating committee for the program is unamended.</p>

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805 (con't)	<p>(c) Program Components—The program under this section shall—</p> <p>(1) use inundation models that meet a standard of accuracy defined by the Administration to improve the quality and extent of inundation mapping, including assessment of vulnerable inner coastal and nearshore areas, in a coordinated and standardized fashion to maximize resources and the utility of data collected;</p> <p>(2) promote and improve community outreach and education networks and programs to ensure community readiness, including the development of comprehensive coastal risk and vulnerability assessment training and decision support tools, implementation of technical training and public education programs, and providing for certification of prepared communities;</p> <p>(3) integrate tsunami preparedness and mitigation programs into 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;</p> <p>(4) promote the adoption of tsunami warning and mitigation measures by Federal, State, tribal, and local governments and nongovernmental entities, including educational programs to discourage development in high-risk areas; and</p> <p>(5) provide for periodic external review of the program.</p> <p>(d) Savings Clause—Nothing in this section shall be construed to require a change in the chair of any existing tsunami hazard mitigation program subcommittee.</p>	505 (con't)	<p>(b) National Tsunami Hazard Mitigation Program—Section 805 (33 U.S.C. 3204) is amended by striking subsections (c) and (d) and inserting the following:</p> <p>“(c) Program Components—The Program conducted under subsection (a) shall include the following:</p> <p>“(1) Technical and financial assistance to coastal States, territories, tribes, and local governments to develop and implement activities under this section.</p> <p>“(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.</p> <p>“(3) Coordination with other Federal preparedness and mitigation programs to leverage Federal investment, avoid duplication, and maximize effort.</p> <p>“(4) Activities to promote the adoption of tsunami resilience, preparedness, warning, and mitigation measures by Federal, State, territorial, tribal, and local governments and nongovernmental entities, including educational and risk communication programs to discourage development in high-risk areas.</p> <p>“(5) Activities to support the development of regional tsunami hazard and risk assessments. Such regional risk assessments may include the following:</p> <p>“(A) The sources, sizes, and other relevant historical data of tsunami in the region, including paleotsunami data.</p> <p>“(B) Inundation models and maps of critical infrastructure and socioeconomic vulnerability in areas subject to tsunami inundation.</p>	<p>Increases the number of program components from five to eight. Greatly expands the detail of requirements and activities under the program components, particularly component (5), supporting the development of regional tsunami hazard and risk assessments; component (6), promoting preparedness in at-risk ports and harbors; component (7), supporting the development of community-based outreach and education programs; and component (8), disseminating guidelines and standards for community planning, education, and training.</p> <p>Adds, in component (1), a requirement to provide technical and financial assistance to coastal states, territories, tribes, and local governments to implement activities required under this section.</p> <p>Places emphasis, in component (4), on resilience, preparedness, warning, and mitigation measures at all levels of government and includes educational and risk communication programs to discourage development in high-risk areas.</p>

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			<p>“(C) Maps of evacuation areas and evacuation routes, including, when appropriate, traffic studies that evaluate the viability of evacuation routes.</p> <p>“(D) Evaluations of the size of populations that will require evacuation, including populations with special evacuation needs.</p> <p>“(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.</p> <p>“(F) Evaluation of at-risk ports and harbors.</p> <p>“(G) Evaluation of the effect of tsunami currents on the foundations of closely-spaced, coastal high-rise structures.</p> <p>“(6) Activities to promote preparedness in at-risk ports and harbors, including the following:</p> <p>“(A) Evaluation and recommendation of procedures for ports and harbors in the event of a distant or near-field tsunami.</p> <p>“(B) A review of readiness, response, and communication strategies to ensure coordination and data sharing with the Coast Guard.</p> <p>“(7) Activities to support the development of community-based outreach and education programs to ensure community readiness and resilience, including the following:</p> <p>“(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.</p> <p>“(B) The development of decision support tools.</p> <p>“(C) The incorporation of social science research into community readiness and resilience efforts.</p> <p>“(D) The development of evidence-based education guidelines.</p>	

Section	P.L. 109-479, Title VIII	Section	P.L. 115-25, Title V	CRS Comments (effect of P.L. 115-25 on P.L. 109-479 and activities it authorized)
			<p>“(8) Dissemination of guidelines and standards for community planning, education, and training products, programs, and tools, including—</p> <p>“(A) standards for—</p> <p>“(i) mapping products;</p> <p>“(ii) inundation models; and</p> <p>“(iii) effective emergency exercises; and</p> <p>“(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.</p>	
805 (con’t)		505 (con’t)	<p>“(d) Authorized Activities—In addition to activities conducted under subsection (c), the program conducted under subsection (a) may include the following:</p> <p>“(1) Multidisciplinary vulnerability assessment research, education, and training to help integrate risk management and resilience objectives with community development planning and policies.</p> <p>“(2) Risk management training for local officials and community organizations to enhance understanding and preparedness.</p> <p>“(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.</p> <p>“(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.</p> <p>“(5) Risk management, risk assessment, and resilience data and information services, including—</p>	<p>Adds a list of authorized activities, in subsection (d), in addition to the program components listed under subsection (c), which may be included in the program. These six activities are as follows: (1) vulnerability assessment research, education, and training; (2) risk management training for local officials and communities; (3) tsunami response exercise planning and implementation; (4) development of applications using existing or emerging technologies; (5) risk management, assessment, and resilience data and information services; and (6) risk notification systems.</p>

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			<p>“(A) access to data and products derived from observing and detection systems; and</p> <p>“(B) development and maintenance of new integrated data products to support risk management, risk assessment, and resilience programs.</p> <p>“(6) Risk notification systems that coordinate with and build upon existing systems and actively engage decisionmakers, State, local, tribal, and territorial governments and agencies, business communities, nongovernmental organizations, and the media.</p>	
805 (con’t)		505 (con’t)	“(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.	Adds a preemption subsection (e), which states that the establishment of national standards for tsunami inundation models does not prevent other levels of government from designating additional at-risk areas.
805 (con’t)		505 (con’t)	“(f) No New Regulatory Authority—Nothing in this Act may be construed as establishing new regulatory authority for any Federal agency.”	Adds subsection (f), which states that no new regulatory authority is created by the legislation.
805 (con’t)		505 (con’t)	(c) Report on Accreditation of TsunamiReady Program—Not later than 180 days after the date of enactment of this Act, the Administrator of the National Oceanic and Atmospheric Administration 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 which authorities and activities would be needed to have the TsunamiReady program of the National Weather Service accredited by the Emergency Management Accreditation Program.	Requires a report that specifies which authorities and activities would be needed to obtain accreditation of the TsunamiReady program by the Emergency Management Accreditation Program (EMAP). ^a
806	SEC. 806. TSUNAMI RESEARCH PROGRAM.	506	SEC. 506. MODIFICATION OF TSUNAMI RESEARCH PROGRAM.	In a new subsection (a), broadens groups NOAA is to consult with to

Section	P.L. 109-479, Title VIII	Section	P.L. 115-25, Title V	CRS Comments (effect of P.L. 115-25 on P.L. 109-479 and activities it authorized)
	<p>The Administrator shall, in consultation with other agencies and academic institutions, and with the coordinating committee established under section 805(b), establish 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, and assessment for tsunami tracking and numerical forecast modeling. Such research program shall—</p> <p>(1) consider other appropriate research to mitigate the impact of tsunami;</p> <p>(2) coordinate with the National Weather Service on technology to be transferred to operations;</p> <p>(3) include social science research to develop and assess community warning, education, and evacuation materials; and</p> <p>(4) ensure that research and findings are available to the scientific community.</p>		<p>Section 806 (33 U.S.C. 3205) is amended—</p> <p>(1) in the matter before paragraph (1), by striking “The Administrator shall” and all that follows through “establish or maintain” and inserting the following:</p> <p>“(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”;</p> <p>(2) in subsection (a), as designated by paragraph (1), by striking “and assessment for tsunami tracking and numerical forecast modeling. Such research program shall—” and inserting the following: “assessment for tsunami tracking and numerical forecast modeling, and standards development.</p> <p>“(b) Responsibilities—The research program supported or maintained under subsection (a) shall—”; and</p> <p>(3) in subsection (b), as designated by paragraph (2)—</p> <p>(A) by amending paragraph (1) to read as follows:</p> <p>“(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”;</p> <p>(B) in paragraph (3)—</p> <p>(i) by striking “include” and inserting “conduct”; and</p> <p>(ii) by striking “and” at the end;</p> <p>(C) by redesignating paragraph (4) as paragraph (5);</p>	<p>include state, tribal, and territorial governments.</p> <p>Adds the term <i>standards development</i> to research on tsunami tracking and numerical forecast modeling.</p> <p>In a new subsection (b), broadens the research mandate to include appropriate and cost-effective solutions to tsunami impact mitigation. Specifies that the program may use new DART arrays, integration of sensors into telecommunication cables, and other real-time tsunami monitoring systems, as well as the supercomputing capacity of the federal government.</p> <p>Adds new subparagraph (4) to require development of a technical basis for validating tsunami maps, tsunami models, digital elevation models, and tsunami forecasts.</p> <p>Requires that research and findings are available to the public as well as the scientific community.</p>

Section	P.L. 109-479, Title VIII	Section	P.L. 115-25, Title V	CRS Comments (effect of P.L. 115-25 on P.L. 109-479 and activities it authorized)
			<p>(D) by inserting after paragraph (3) the following: “(4) develop the technical basis for validation of tsunami maps, numerical tsunami models, digital elevation models, and forecasts; and”; and</p> <p>(E) in paragraph (5), as redesignated by subparagraph (C), by striking “to the scientific community” and inserting “to the public and the scientific community.”</p>	
807	<p>SEC. 807. GLOBAL TSUNAMI WARNING AND MITIGATION NETWORK.</p> <p>(a) International Tsunami Warning System—The Administrator, through the National Weather Service and in consultation with other relevant Administration offices, in coordination with other members of the United States Interagency Committee of the National Tsunami Hazard Mitigation Program, shall provide technical assistance and training to the Intergovernmental Oceanographic Commission, the World Meteorological Organization, and other international entities, as part of international efforts to develop a fully functional global tsunami forecast and warning system comprising regional tsunami warning networks, modeled on the International Tsunami Warning System of the Pacific.</p> <p>(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, shall 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</p>	507	<p>SEC. 507. GLOBAL TSUNAMI WARNING AND MITIGATION NETWORK.</p> <p>Section 807 (33 U.S.C. 3206) is amended—</p> <p>(1) by amending subsection (a) to read as follows: “(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.”;</p> <p>(2) in subsection (b), by striking “shall” each place it appears and inserting “may”; and</p> <p>(3) in subsection (c)—</p> <p>(A) in paragraph (1), by striking “establishing” and inserting “supporting”; and</p> <p>(B) in paragraph (2)—</p> <p>(i) by striking “establish” and inserting “support”; and</p>	<p>Requires NOAA to coordinate with the State Department in providing support to the Intergovernmental Oceanographic Commission.</p> <p>Removes the obligation, and allows agency discretion, for NOAA to operate an International Tsunami Information Center, by striking the word <i>shall</i> and replacing it with the word <i>may</i> throughout subsection (b).</p>

Section	P.L. 109-479, Title VIII	Section	P.L. 115-25, Title V	CRS Comments (effect of P.L. 115-25 on P.L. 109-479 and activities it authorized)
	<p>Intergovernmental Oceanographic Commission. As part of its responsibilities around the world, the Center shall—</p> <p>(1) monitor international tsunami warning activities around the world;</p> <p>(2) assist member states in establishing national warning systems, and make information available on current technologies for tsunami warning systems;</p> <p>(3) maintain a library of materials to promulgate knowledge about tsunami in general and for use by the scientific community; and</p> <p>(4) disseminate information, including educational materials and research reports.</p> <p>(c) Detection Equipment; Technical Advice and Training— In carrying out this section, the National Weather Service—</p> <p>(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 establishing communication and warning networks and contact points in each vulnerable nation;</p> <p>(2) may establish a process for transfer of detection and communication technology to affected nations for the purposes of establishing the international tsunami warning system; and</p> <p>(3) shall provide technical and other assistance to support international tsunami programs.</p> <p>(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.</p>		(ii) by striking “establishing” and inserting “supporting.”	

Section	P.L. 109-479, Title VIII	Section	P.L. 115-25, Title V	CRS Comments (effect of P.L. 115-25 on P.L. 109-479 and activities it authorized)
		508	<p>SEC. 508. TSUNAMI SCIENCE AND TECHNOLOGY ADVISORY PANEL.</p> <p>(a) In General—The Act is further amended—</p> <p>(1) by redesignating section 808 (33 U.S.C. 3207) as section 809; and</p> <p>(2) by inserting after section 807 (33 U.S.C. 3206) the following:</p> <p>“SEC. 808. TSUNAMI SCIENCE AND TECHNOLOGY ADVISORY PANEL.</p> <p>“(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.</p> <p>“(b) Membership-</p> <p>“(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.</p> <p>“(2) FEDERAL EMPLOYMENT—No member of the Panel may be a Federal employee.</p> <p>“(c) Responsibilities—Not less frequently than once every 4 years, the Panel shall—</p> <p>“(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</p> <p>“(2) submit to the Administrator and such others as the Administrator considers appropriate—</p>	<p>Redesignates Section 808 of P.L. 109-479 as Section 809. Adds a new Section 808, which establishes a tsunami science and technology advisory panel, comprised of at least seven nonfederal members, to provide advice to NOAA about its tsunami program activities. The panel is required to meet at least once every four years and is required to review the tsunami program and submit a report to Congress at least every four years on its findings and recommendations.</p>

Section	P.L. 109-479, Title VIII	Section	P.L. 115-25, Title V	CRS Comments (effect of P.L. 115-25 on P.L. 109-479 and activities it authorized)
			<p>“(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.</p> <p>“(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).”</p> <p>(b) Table of Contents Amendment—The table of contents in section 1(b) of the Magnuson-Stevens Fishery Conservation and Management Reauthorization Act of 2006 (Public Law 109-479; 120 Stat. 3575) is amended by striking the item relating to section 808 and inserting the following: “Sec. 808. Tsunami Science and Technology Advisory Panel. “Sec. 809. Authorization of appropriations.”</p>	
		509	<p>SEC. 509. REPORTS.</p> <p>(a) Report on Implementation of Tsunami Warning and Education Act-</p> <p>(1) IN GENERAL—Not later than 1 year after the date of the enactment of this Act, the Administrator of the National Oceanic and Atmospheric Administration shall submit to Congress a report on the implementation of the Tsunami Warning and Education Act enacted as title VIII of the Magnuson-Stevens Fishery Conservation and Management Reauthorization Act of 2006 (Public Law 109-479; 33 U.S.C. 3201 et seq.), as amended by this Act.</p> <p>(2) ELEMENTS—The report required by paragraph (1) shall include the following:</p>	<p>Adds a new requirement that NOAA submit reports to Congress within one year of enactment (i.e., by April 18, 2018) on the implementation of this legislation.</p> <p>Requires NOAA, in one report, to include a detailed description of progress implementing (1) Section 804(d)(6), ensuring that resources are available from NWS to implement this legislation; (2) Section 805(b), ensuring that the coordinating committee is carrying</p>

Section	P.L. 109-479, Title VIII	Section	P.L. 115-25, Title V	CRS Comments (effect of P.L. 115-25 on P.L. 109-479 and activities it authorized)
			<p>(A) A detailed description of the progress made in implementing sections 804(d)(6), 805(b), and 806(b)(4) of the Tsunami Warning and Education Act the Magnuson-Stevens Fishery Conservation and Management Reauthorization Act of 2006 (Public Law 109-479; 33 U.S.C. 3201 et seq.).</p> <p>(B) A description of the ways that tsunami warnings and warning products issued by the Tsunami Forecasting and Warning Program established under section 804 of the Tsunami Warning and Education Act (33 U.S.C. 3203), as amended by this Act, may be standardized and streamlined with warnings and warning products for hurricanes, coastal storms, and other coastal flooding events.</p> <p>(b) Report on National Efforts That Support Rapid Response Following Near-shore Tsunami Events-</p> <p>(1) IN GENERAL—Not later than 1 year after the date of the enactment of this Act, the Administrator and the Secretary of Homeland Security shall jointly, in coordination with the Director of the United States Geological Survey, Administrator of the Federal Emergency Management Agency, the Chief of the National Guard Bureau, and the heads of such other Federal agencies as the Administrator considers appropriate, submit to the appropriate committees of Congress a report on the national efforts in effect on the day before the date of the enactment of this Act that support and facilitate rapid emergency response following a domestic near-shore tsunami event to better understand domestic effects of earthquake derived tsunami on people, infrastructure, and communities in the United States.</p> <p>(2) ELEMENTS—The report required by paragraph (1) shall include the following:</p> <p>(A) A description of scientific or other measurements collected on the day before the date of the enactment of this Act to quickly identify and quantify lost or degraded infrastructure or terrestrial formations.</p>	<p>out its responsibilities for implementing this legislation; and (3) Section 806(b)(4), ensuring that NOAA develops the technical basis for validation of tsunami maps, numerical tsunami models, digital elevation models, and forecasts.</p> <p>Requires NOAA to describe how tsunami warnings and products are integrated with warnings and products for other natural hazards.</p> <p>Requires NOAA—in another report issued jointly with DHS, USGS, FEMA, the National Guard, and other agencies, as appropriate—to describe activities under way prior to enactment of P.L. 115-25 on national efforts that support and facilitate rapid emergency response following a tsunami.</p>

Section	P.L. 109-479, Title VIII	Section	P.L. 115-25, Title V	CRS Comments (effect of P.L. 115-25 on P.L. 109-479 and activities it authorized)
			<p>(B) A description of scientific or other measurements that would be necessary to collect to quickly identify and quantify lost or degraded infrastructure or terrestrial formations.</p> <p>(C) Identification and evaluation of Federal, State, local, tribal, territorial, and military first responder and search and rescue operation centers, bases, and other facilities as well as other critical response assets and infrastructure, including search and rescue aircraft, located within near-shore and distant tsunami inundation areas on the day before the date of the enactment of this Act.</p> <p>(D) An evaluation of near-shore tsunami response plans in areas described in subparagraph (C) in effect on the day before the date of the enactment of this Act, and how those response plans would be affected by the loss of search and rescue and first responder infrastructure described in such subparagraph.</p> <p>(E) A description of redevelopment plans and reports in effect on the day before the date of the enactment of this Act for communities in areas that are at high-risk for near-shore tsunami, as well identification of States or communities that do not have redevelopment plans.</p> <p>(F) Recommendations to enhance near-shore tsunami preparedness and response plans, including recommended responder exercises, predisaster planning, and mitigation needs.</p> <p>(G) Such other data and analysis information as the Administrator and the Secretary of Homeland Security consider appropriate.</p> <p>(3) APPROPRIATE COMMITTEES OF CONGRESS—In this subsection, the term “appropriate committees of Congress” means—</p> <p>(A) the Committee on Commerce, Science, and Transportation and the Committee on Homeland Security and Governmental Affairs of the Senate; and</p>	

Section	P.L. 109-479, Title VIII	Section	P.L. 115-25, Title V	CRS Comments (effect of P.L. 115-25 on P.L. 109-479 and activities it authorized)
			(B) the Committee on Science, Space, and Technology, the Committee on Homeland Security, and the Committee on Transportation and Infrastructure of the House of Representatives.	
808	<p>SEC. 808. AUTHORIZATION OF APPROPRIATIONS.</p> <p>There are authorized to be appropriated to the Administrator to carry out this title—</p> <p>(1) \$25,000,000 for fiscal year 2008, of which—</p> <p>(A) not less than 27 percent of the amount appropriated shall be for the tsunami hazard mitigation program under section 805; and</p> <p>(B) not less than 8 percent of the amount appropriated shall be for the tsunami research program under section 806;</p> <p>(2) \$26,000,000 for fiscal year 2009, of which—</p> <p>(A) not less than 27 percent of the amount appropriated shall be for the tsunami hazard mitigation program under section 805; and</p> <p>(B) not less than 8 percent of the amount appropriated shall be for the tsunami research program under section 806;</p> <p>(3) \$27,000,000 for fiscal year 2010, of which—</p> <p>(A) not less than 27 percent of the amount appropriated shall be for the tsunami hazard mitigation program under section 805; and</p> <p>(B) not less than 8 percent of the amount appropriated shall be for the tsunami research program under section 806;</p> <p>(4) \$28,000,000 for fiscal year 2011, of which—</p> <p>(A) not less than 27 percent of the amount appropriated shall be for the tsunami hazard mitigation program under section 805; and</p>	510	<p>SEC. 510. AUTHORIZATION OF APPROPRIATIONS.</p> <p>Section 809 of the Act, as redesignated by section X08(a)(1) of this Act, is amended—</p> <p>(1) in paragraph (4)(B), by striking “and” at the end;</p> <p>(2) in paragraph (5)(B), by striking the period at the end and inserting “; and”; and</p> <p>(3) by adding at the end the following:</p> <p>“(6) \$25,800,000 for each of fiscal years 2016 through 2021, of which—</p> <p>“(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</p> <p>“(B) not less than 8 percent of the amount appropriated shall be for the tsunami research program under section 806.”</p>	<p>Authorizes appropriations of \$25.8 million per year from FY2016 through FY2021 for the program, of which 27% would be for state-level activities authorized under Section 805 and at least 8% would be for tsunami research under Section 806.</p> <p>The amount authorized would be less, by \$3.2 million per year (nominal dollars), than the amount authorized for FY2012, the last year in which appropriations were authorized under P.L. 109-479.</p>

Section	P.L. 109-479, Title VIII	Section	P.L. 115-25, Title V	CRS Comments (effect of P.L. 115-25 on P.L. 109-479 and activities it authorized)
	<p>(B) not less than 8 percent of the amount appropriated shall be for the tsunami research program under section 806; and</p> <p>(5) \$29,000,000 for fiscal year 2012, of which—</p> <p>(A) not less than 27 percent of the amount appropriated shall be for the tsunami hazard mitigation program under section 805; and</p> <p>(B) not less than 8 percent of the amount appropriated shall be for the tsunami research program under section 806.</p>			
		511	<p>SEC. 511. OUTREACH RESPONSIBILITIES.</p> <p>The Administrator of the National Oceanic and Atmospheric Administration, in coordination with State and local emergency managers, shall develop and carry out formal outreach activities to improve tsunami education and awareness and foster the development of resilient communities. Outreach activities may include—</p> <p>(1) the development of outreach plans to ensure the close integration of tsunami warning centers supported or maintained under section 804(d) of the Tsunami Warning and Education Act (33 U.S.C. 3203(d)), as amended by this Act, with local Weather Forecast Offices of the National Weather Service and emergency managers;</p> <p>(2) working with appropriate local Weather Forecast Offices to ensure they have the technical knowledge and capability to disseminate tsunami warnings to the communities they serve; and</p> <p>(3) evaluating the effectiveness of warnings and of coordination with local Weather Forecast Offices after significant tsunami events.</p>	<p>Adds a new requirement for NOAA to coordinate with state and local emergency managers to carry out outreach activities to improve tsunami awareness and help improve community resilience to tsunami.</p>

Section	P.L. 109-479, Title VIII	Section	P.L. 115-25, Title V	CRS Comments (effect of P.L. 115-25 on P.L. 109-479 and activities it authorized)
		512	<p>SEC. 512. REPEAL OF DUPLICATE PROVISIONS OF LAW.</p> <p>(a) Repeal—The Tsunami Warning and Education Act enacted by Public Law 109-424 (120 Stat. 2902) is repealed.</p> <p>(b) Construction—Nothing in this section may be construed to repeal, or affect in any way, the Tsunami Warning and Education Act enacted as title VIII of the Magnuson-Stevens Fishery Conservation and Management Reauthorization Act of 2006 (Public Law 109-479; 33 U.S.C. 3201 et seq.).</p>	Repeals P.L. 109-424, passed by the 109 th Congress, which enacted similar provisions as P.L. 109-479.

Source: Congressional Research Service. Text in the first two columns quoted from P.L. 109-479, Title VIII, and P.L. 115-25, Title V, respectively.

Notes: DART = Deep-Ocean Assessment and Reporting of Tsunami buoy; DHS = Department of Homeland Security; EMAP = Emergency Management Accreditation Program; FEMA = Federal Emergency Management Agency; GAO = Government Accountability Office; IOOS = Integrated Ocean Observing System; NOAA = National Oceanic and Atmospheric Administration; NSF = National Science Foundation; NWS = National Weather Service; USGS = U.S. Geological Survey.

- a. EMAP is an independent, nonprofit organization that establishes standards and a process for accrediting government emergency management agencies. See www.emap.org.

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