

115TH CONGRESS  
1ST SESSION

# S. 53

To authorize and strengthen the tsunami detection, forecast, warning, research, and mitigation program of the National Oceanic and Atmospheric Administration, and for other purposes.

---

## IN THE SENATE OF THE UNITED STATES

JANUARY 5, 2017

Ms. CANTWELL (for herself, Mr. SULLIVAN, and Mr. SCHATZ) introduced the following bill; which was read twice and referred to the Committee on Commerce, Science, and Transportation

---

## A BILL

To authorize and strengthen the tsunami detection, forecast, warning, research, and mitigation program of the National Oceanic and Atmospheric Administration, and for other purposes.

1 *Be it enacted by the Senate and House of Representa-*  
2 *tives of the United States of America in Congress assembled,*

3 **SECTION 1. SHORT TITLE.**

4 This Act may be cited as the “Tsunami Warning,  
5 Education, and Research Act of 2017”.

1 **SEC. 2. REFERENCES TO THE TSUNAMI WARNING AND EDU-**  
2 **CATION ACT.**

3 Except as otherwise expressly provided, whenever in  
4 this Act an amendment or repeal is expressed in terms  
5 of an amendment to, or repeal of, a section or other provi-  
6 sion, the reference shall be considered to be made to a  
7 section or other provision of the Tsunami Warning and  
8 Education Act enacted as title VIII of Public Law 109–  
9 479 (33 U.S.C. 3201 et seq.).

10 **SEC. 3. EXPANSION OF PURPOSES OF TSUNAMI WARNING**  
11 **AND EDUCATION ACT.**

12 Section 803 (33 U.S.C. 3202) is amended—

13 (1) in paragraph (1), by inserting “research,”  
14 after “warnings,”;

15 (2) by amending paragraph (2) to read as fol-  
16 lows:

17 “(2) to enhance and modernize the existing tsu-  
18 nami warning system in the United States to in-  
19 crease the accuracy of forecasts and warnings, to en-  
20 sure full coverage of tsunami threats to the United  
21 States with a network of detection assets, and to re-  
22 duce false alarms;”;

23 (3) by amending paragraph (3) to read as fol-  
24 lows:

25 “(3) to improve and develop standards and  
26 guidelines for mapping, modeling, and assessment

1 efforts to improve tsunami detection, forecasting,  
2 warnings, notification, mitigation, resiliency, re-  
3 sponse, outreach, and recovery;”;

4 (4) by redesignating paragraphs (4), (5), and  
5 (6) as paragraphs (5), (6), and (8), respectively;

6 (5) by inserting after paragraph (3) the fol-  
7 lowing:

8 “(4) to improve research efforts related to im-  
9 proving tsunami detection, forecasting, warnings, no-  
10 tification, evacuation, mitigation, resiliency, re-  
11 sponse, outreach, and recovery;”;

12 (6) in paragraph (5), as redesignated—

13 (A) by striking “and increase” and insert-  
14 ing “, increase, and develop uniform standards  
15 and guidelines for”; and

16 (B) by inserting “, including the warning  
17 signs of locally generated tsunami” after “ap-  
18 proaching”;

19 (7) in paragraph (6), as redesignated, by strik-  
20 ing “, including the Indian Ocean; and” and insert-  
21 ing a semicolon; and

22 (8) by inserting after paragraph (6), as redesi-  
23 gnated, the following:

24 “(7) to foster resilient communities in the face  
25 of tsunami and other similar coastal hazards; and”.

1 **SEC. 4. MODIFICATION OF TSUNAMI FORECASTING AND**  
2 **WARNING PROGRAM.**

3 (a) IN GENERAL.—Subsection (a) of section 804 (33  
4 U.S.C. 3203(a)) is amended by striking “Atlantic Ocean,  
5 Caribbean Sea, and Gulf of Mexico region.” and inserting  
6 “Atlantic Ocean region, including the Caribbean Sea and  
7 the Gulf of Mexico.”.

8 (b) COMPONENTS.—Subsection (b) of section 804 (33  
9 U.S.C. 3203(b)) is amended—

10 (1) in paragraph (1), by striking “established”  
11 and inserting “supported or maintained”;

12 (2) by redesignating paragraphs (2) through  
13 (9) as paragraphs (3) through (10), respectively;

14 (3) by inserting after paragraph (1) the fol-  
15 lowing:

16 “(2) to the degree practicable, maintain not less  
17 than 80 percent of the Deep-Ocean Assessment and  
18 Reporting of Tsunamis buoy array at operational ca-  
19 pacity to optimize data reliability;”;

20 (4) by amending paragraph (5), as redesignated  
21 by paragraph (2), to read as follows:

22 “(5) provide tsunami forecasting capability  
23 based on models and measurements, including tsu-  
24 nami inundation models and maps for use in in-  
25 creasing the preparedness of communities and safe-

1 guarding port and harbor operations, that incor-  
2 porate inputs, including—

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

5 “(B) the global Earth observing system;

6 “(C) the global seismic network;

7 “(D) the Advanced National Seismic sys-  
8 tem;

9 “(E) tsunami model validation using his-  
10 torical and paleotsunami data;

11 “(F) digital elevation models and bathym-  
12 etry; and

13 “(G) newly developing tsunami detection  
14 methodologies using satellites and airborne re-  
15 mote sensing;”;

16 (5) by amending paragraph (7), as redesignated  
17 by paragraph (2), to read as follows:

18 “(7) include a cooperative effort among the Ad-  
19 ministration, the United States Geological Survey,  
20 and the National Science Foundation under which  
21 the Director of the United States Geological Survey,  
22 in coordination with the Administrator, and the Di-  
23 rector of the National Science Foundation shall—

1           “(A) provide rapid and reliable seismic in-  
2           formation to the Administrator from inter-  
3           national and domestic seismic networks; and

4           “(B) support seismic stations installed be-  
5           fore the date of the enactment of the Tsunami  
6           Warning, Education, and Research Act of 2017  
7           to supplement coverage in areas of sparse in-  
8           strumentation;”;

9           (6) in paragraph (8), as redesignated by para-  
10          graph (2)—

11           (A) by inserting “, including graphical  
12           warning products,” after “warnings”;

13           (B) by inserting “, territories,” after  
14           “States”; and

15           (C) by inserting “and Wireless Emergency  
16           Alerts” after “Hazards Program”; and

17           (7) in paragraph (9), as redesignated by para-  
18          graph (2)—

19           (A) by inserting “provide and” before  
20           “allow”; and

21           (B) by inserting “and commercial and  
22           Federal undersea communications cables” after  
23           “observing technologies”.

1           (c) TSUNAMI WARNING SYSTEM.—Subsection (c) of  
2 section 804 (33 U.S.C. 3203(c)) is amended to read as  
3 follows:

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

7                   “(1) is capable of forecasting tsunami, includ-  
8 ing forecasting tsunami arrival time and inundation  
9 estimates, anywhere in the Pacific and Arctic Ocean  
10 regions and providing adequate warnings;

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

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

18                           “(B) to pose significant risks of tsunami  
19 for States along the coastal areas of the Atlan-  
20 tic Ocean, Caribbean Sea, or Gulf of Mexico;  
21 and

22                   “(3) supports other international tsunami fore-  
23 casting and warning efforts.”.

1 (d) TSUNAMI WARNING CENTERS.—Subsection (d)  
2 of section 804 (33 U.S.C. 3203(d)) is amended to read  
3 as follows:

4 “(d) TSUNAMI WARNING CENTERS.—

5 “(1) IN GENERAL.—The Administrator shall  
6 support or maintain centers to support the tsunami  
7 warning system required by subsection (e). Such  
8 centers shall include—

9 “(A) the National Tsunami Warning Cen-  
10 ter, located in Alaska, which is primarily re-  
11 sponsible for Alaska and the continental United  
12 States;

13 “(B) the Pacific Tsunami Warning Center,  
14 located in Hawaii, which is primarily respon-  
15 sible for Hawaii, the Caribbean, and other  
16 areas of the Pacific not covered by the National  
17 Center; and

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

21 “(2) RESPONSIBILITIES.—The responsibilities  
22 of the centers supported or maintained under para-  
23 graph (1) shall include the following:

24 “(A) Continuously monitoring data from  
25 seismological, deep-ocean, coastal sea level, and



1 tidal monitoring stations and other data sources  
2 as may be developed and deployed.

3 “(B) In coordination with the United  
4 States Geological Survey and State geological  
5 surveys, evaluating earthquakes, landslides, and  
6 volcanic activity that have the potential to gen-  
7 erate tsunami.

8 “(C) Evaluating deep-ocean buoy data and  
9 tidal monitoring stations for indications of tsu-  
10 nami resulting from earthquakes and other  
11 sources.

12 “(D) To the extent practicable, utilizing a  
13 range of models, including ensemble models, to  
14 predict tsunami, including arrival times, flood-  
15 ing estimates, coastal and harbor currents, and  
16 duration.

17 “(E) Using data from the Integrated  
18 Ocean Observing System of the Administration  
19 in coordination with regional associations to cal-  
20 culate new inundation estimates and periodi-  
21 cally update existing inundation estimates.

22 “(F) Disseminating forecasts and tsunami  
23 warning bulletins to Federal, State, tribal, and  
24 local government officials, critical infrastructure  
25 operators, and the public.

1           “(G) Coordinating with the national tsu-  
2           nami hazard mitigation program conducted  
3           under section 805 to ensure ongoing sharing of  
4           information between forecasters and Federal,  
5           State, tribal and local emergency management  
6           officials.

7           “(H) In coordination with the Coast  
8           Guard, evaluating and recommending proce-  
9           dures for ports and harbors at risk of tsunami  
10          inundation, including review of readiness, re-  
11          sponse, and communication strategies, and data  
12          sharing policies.

13          “(I) Making data gathered under this Act  
14          and post-warning analyses conducted by the  
15          National Weather Service or other relevant Ad-  
16          ministration offices available to the public.

17          “(J) Integrating and modernizing the pro-  
18          gram operated under this section with advances  
19          in tsunami science to improve performance  
20          without compromising service.

21          “(3) FAIL-SAFE WARNING CAPABILITY.—The  
22          tsunami warning centers supported or maintained  
23          under paragraph (1) shall maintain a fail-safe warn-  
24          ing capability and perform back-up duties for each  
25          other.

1           “(4) COORDINATION WITH NATIONAL WEATHER  
2 SERVICE.—The Administrator shall coordinate with  
3 the forecast offices of the National Weather Service,  
4 the Centers supported or maintained under para-  
5 graph (1), and such program offices of the Adminis-  
6 tration as the Administrator or the coordinating  
7 committee, as established in section 805(d), consider  
8 appropriate to ensure that regional and local fore-  
9 cast offices—

10                   “(A) have the technical knowledge and ca-  
11 pability to disseminate tsunami warnings for  
12 the communities they serve;

13                   “(B) leverage connections with local emer-  
14 gency management officials for optimally dis-  
15 seminating tsunami warnings and forecasts;  
16 and

17                   “(C) implement mass communication tools  
18 in effect on the day before the date of the en-  
19 actment of the Tsunami Warning, Education,  
20 and Research Act of 2017 used by the National  
21 Weather Service on such date and newer mass  
22 communication technologies as they are devel-  
23 oped as a part of the Weather-Ready Nation  
24 program of the Administration, or otherwise,

1 for the purpose of timely and effective delivery  
2 of tsunami warnings.

3 “(5) UNIFORM OPERATING PROCEDURES.—The  
4 Administrator shall—

5 “(A) develop uniform operational proce-  
6 dures for the centers supported or maintained  
7 under paragraph (1), including the use of soft-  
8 ware applications, checklists, decision support  
9 tools, and tsunami warning products that have  
10 been standardized across the program sup-  
11 ported under this section;

12 “(B) ensure that processes and products of  
13 the warning system operated under subsection  
14 (c)—

15 “(i) reflect industry best practices  
16 when practicable;

17 “(ii) conform to the maximum extent  
18 practicable with internationally recognized  
19 standards for information technology; and

20 “(iii) conform to the maximum extent  
21 practicable with other warning products  
22 and practices of the National Weather  
23 Service;

1           “(C) ensure that future adjustments to  
2           operational protocols, processes, and warning  
3           products—

4                   “(i) are made consistently across the  
5           warning system operated under subsection  
6           (c); and

7                   “(ii) are applied in a uniform manner  
8           across such warning system;

9           “(D) establish a systematic method for in-  
10          formation technology product development to  
11          improve long-term technology planning efforts;  
12          and

13           “(E) disseminate guidelines and metrics  
14          for evaluating and improving tsunami forecast  
15          models.

16          “(6) AVAILABLE RESOURCES.—The Adminis-  
17          trator, through the National Weather Service, shall  
18          ensure that resources are available to fulfill the obli-  
19          gations of this Act. This includes ensuring super-  
20          computing resources are available to run, as rapidly  
21          as possible, such computer models as are needed for  
22          purposes of the tsunami warning system operated  
23          under subsection (c).”.

1           (e) TRANSFER OF TECHNOLOGY; MAINTENANCE AND  
2 UPGRADES.—Subsection (e) of section 804 (33 U.S.C.  
3 3203(e)) is amended to read as follows:

4           “(e) TRANSFER OF TECHNOLOGY; MAINTENANCE  
5 AND UPGRADES.—In carrying out this section, the Admin-  
6 istrator shall—

7                   “(1) develop requirements for the equipment  
8 used to forecast tsunami, including—

9                           “(A) provisions for multipurpose detection  
10 platforms;

11                           “(B) reliability and performance metrics;  
12 and

13                           “(C) to the maximum extent practicable,  
14 requirements for the integration of equipment  
15 with other United States and global ocean and  
16 coastal observation systems, the Global Earth  
17 Observation System of Systems, the Global  
18 Seismic Networks, and the Advanced National  
19 Seismic System;

20                   “(2) develop and execute a plan for the transfer  
21 of technology from ongoing research conducted as  
22 part of the program supported or maintained under  
23 section 806 into the program under this section; and

1           “(3) ensure that the Administration’s oper-  
2           ational tsunami detection equipment is properly  
3           maintained.”.

4           (f) FEDERAL COOPERATION.—Subsection (f) of sec-  
5           tion 804 (33 U.S.C. 3203(f)) is amended to read as fol-  
6           lows:

7           “(f) FEDERAL COOPERATION.—When deploying and  
8           maintaining tsunami detection technologies under the pro-  
9           gram under this section, the Administrator shall—

10           “(1) identify which assets of other Federal  
11           agencies are necessary to support such program; and

12           “(2) work with each agency identified under  
13           paragraph (1)—

14           “(A) to acquire the agency’s assistance;  
15           and

16           “(B) to prioritize the necessary assets in  
17           support of the tsunami forecast and warning  
18           program.”.

19           (g) UNNECESSARY PROVISIONS.—Section 804 (33  
20           U.S.C. 3203) is further amended—

21           (1) by striking subsection (g);

22           (2) by striking subsections (i) through (k); and

23           (3) by redesignating subsection (h) as sub-  
24           section (g).

1 (h) CONGRESSIONAL NOTIFICATIONS.—Subsection  
2 (g) of section 804 (33 U.S.C. 3203(g)), as redesignated  
3 by subsection (g)(3), is amended—

4 (1) by redesignating paragraphs (1) and (2) as  
5 subparagraphs (A) and (B), respectively, and mov-  
6 ing such subparagraphs 2 ems to the right;

7 (2) in the matter before subparagraph (A), as  
8 redesignated by paragraph (1), by striking “The Ad-  
9 ministrator” and inserting the following:

10 “(1) IN GENERAL.—The Administrator”;

11 (3) in paragraph (1), as redesignated by para-  
12 graph (2)—

13 (A) in subparagraph (A), as redesignated  
14 by paragraph (1), by striking “and” at the end;

15 (B) in subparagraph (B), as redesignated  
16 by paragraph (2), by striking the period at the  
17 end and inserting “; and”; and

18 (C) by adding at the end the following:

19 “(C) the occurrence of a significant tsu-  
20 nami warning.”; and

21 (4) by adding at the end the following:

22 “(2) CONTENTS.—In a case in which notice is  
23 submitted under paragraph (1) within 30 days of a  
24 significant tsunami warning described in subpara-  
25 graph (C) of such paragraph, such notice shall in-



1       clude, as appropriate, brief information and analysis  
2       of—

3               “(A) the accuracy of the tsunami model  
4       used;

5               “(B) the specific deep-ocean or other moni-  
6       toring equipment that detected the incident, as  
7       well as the deep-ocean or other monitoring  
8       equipment that did not detect the incident due  
9       to malfunction or other reasons;

10              “(C) the effectiveness of the warning com-  
11       munication, including the dissemination of  
12       warnings with State, territory, local, and tribal  
13       partners in the affected area under the jurisdic-  
14       tion of the National Weather Service; and

15              “(D) such other findings as the Adminis-  
16       trator considers appropriate.”.

17 **SEC. 5. MODIFICATION OF NATIONAL TSUNAMI HAZARD**  
18 **MITIGATION PROGRAM.**

19       (a) **IN GENERAL.**—Subsection (a) of section 805 (33  
20 U.S.C. 3204(a)) is amended to read as follows:

21       “(a) **PROGRAM REQUIRED.**—The Administrator, in  
22 coordination with the Administrator of the Federal Emer-  
23 gency Management Agency and the heads of such other  
24 agencies as the Administrator considers relevant, shall  
25 conduct a community-based tsunami hazard mitigation

1 program to improve tsunami preparedness and resiliency  
2 of at-risk areas in the United States and the territories  
3 of the United States.”.

4 (b) NATIONAL TSUNAMI HAZARD MITIGATION PRO-  
5 GRAM.—Section 805 (33 U.S.C. 3204) is amended by  
6 striking subsections (c) and (d) and inserting the fol-  
7 lowing:

8 “(c) PROGRAM COMPONENTS.—The program under  
9 this section shall include the following:

10 “(1) Technical and financial assistance to  
11 coastal States, territories, tribes, and local govern-  
12 ments to develop and implement activities under this  
13 section.

14 “(2) Integration of tsunami preparedness and  
15 mitigation programs into ongoing State-based haz-  
16 ard warning, resilience planning, and risk manage-  
17 ment activities, including predisaster planning, emer-  
18 gency response, evacuation planning, disaster recov-  
19 ery, hazard mitigation including Natural Hazard  
20 Mitigation Plans, and community development and  
21 redevelopment planning programs in affected areas.

22 “(3) Activities to promote the adoption of tsu-  
23 nami resilience, preparedness, warning, and mitiga-  
24 tion measures by Federal, State, territorial, tribal,  
25 and local governments and nongovernmental entities,

1 including educational and risk communication pro-  
2 grams to discourage development in high-risk areas.

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

6 “(A) The sources, sizes, and other relevant  
7 historical data of tsunami in the region, includ-  
8 ing paleotsunami data.

9 “(B) Inundation models and maps of crit-  
10 ical infrastructure and socioeconomic vulner-  
11 ability in areas subject to tsunami inundation.

12 “(C) Maps of evacuation areas and evacu-  
13 ation routes, including, when appropriate, traf-  
14 fic studies that evaluate the viability of evacu-  
15 ation routes.

16 “(D) Evaluations of the size of populations  
17 that will require evacuation, including popu-  
18 lations with special evacuation needs.

19 “(E) Evaluations and technical assistance  
20 for vertical evacuation structure planning for  
21 communities where models indicate limited or  
22 no ability for timely evacuation, especially in  
23 areas at risk of near-field generated tsunami.

24 “(F) Evaluation of at-risk ports and har-  
25 bors.

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

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

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

9           “(B) A review of readiness, response, and  
10          communication strategies to ensure coordina-  
11          tion and data sharing with the Coast Guard.

12          “(6) Activities to support the development of  
13          community-based outreach and education programs  
14          to ensure community readiness and resilience, in-  
15          cluding the following:

16          “(A) The development, implementation,  
17          and assessment of technical training and public  
18          education programs, including education pro-  
19          grams that address unique characteristics of  
20          distant and near-field tsunami.

21          “(B) The development of decision support  
22          tools.

23          “(C) The incorporation of social science re-  
24          search into community readiness and resilience  
25          efforts.

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

3           “(7) Dissemination of guidelines and standards  
4 for community planning, education, and training  
5 products, programs, and tools, including—

6           “(A) standards for—

7           “(i) mapping products;

8           “(ii) inundation models; and

9           “(iii) effective emergency exercises;

10           and

11           “(B) recommended guidance for at-risk  
12 port and harbor tsunami warning, evacuation,  
13 and response procedures in coordination with  
14 the Coast Guard.

15           “(d) AUTHORIZED ACTIVITIES.—In addition to ac-  
16 tivities conducted under subsection (c), the program under  
17 this section may include the following:

18           “(1) Multidisciplinary vulnerability assessment  
19 research, education, and training to help integrate  
20 risk management and resilience objectives with com-  
21 munity development planning and policies.

22           “(2) Risk management training for local offi-  
23 cials and community organizations to enhance un-  
24 derstanding and preparedness.

1           “(3) Interagency, Federal, State, tribal, and  
2 territorial intergovernmental tsunami response exer-  
3 cise planning and implementation in high-risk areas.

4           “(4) Development of practical applications for  
5 existing or emerging technologies, such as modeling,  
6 remote sensing, geospatial technology, engineering,  
7 and observing systems, including the integration of  
8 tsunami sensors into Federal and commercial sub-  
9 marine telecommunication cables if practicable.

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

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

14                   “(B) development and maintenance of new  
15 integrated data products to support risk man-  
16 agement, risk assessment, and resilience pro-  
17 grams.

18           “(6) Risk notification systems that coordinate  
19 with and build upon existing systems and actively  
20 engage decisionmakers, State, local, tribal, and terri-  
21 torial governments and agencies, business commu-  
22 nities, nongovernmental organizations, and the  
23 media.

24           “(e) NO PREEMPTION WITH RESPECT TO DESIGNA-  
25 TION OF AT-RISK AREAS.—The establishment of national

1 standards for inundation models under this section shall  
2 not prevent States, territories, tribes, and local govern-  
3 ments from designating additional areas as being at risk  
4 based on knowledge of local conditions.

5 “(f) NO NEW REGULATORY AUTHORITY.—Nothing  
6 in this Act may be construed as establishing new regu-  
7 latory authority for any Federal agency.”.

8 (c) REPORT ON ACCREDITATION OF TSUNAMIREADY  
9 PROGRAM.—Not later than 180 days after the date of en-  
10 actment of this Act, the Administrator of the National  
11 Oceanic and Atmospheric Administration shall submit to  
12 the Committee on Commerce, Science, and Transportation  
13 of the Senate and the Committee on Science, Space, and  
14 Technology of the House of Representatives a report on  
15 which authorities and activities would be needed to have  
16 the TsunamiReady program of the National Weather  
17 Service accredited by the Emergency Management Accred-  
18 itation Program.

19 **SEC. 6. MODIFICATION OF TSUNAMI RESEARCH PROGRAM.**

20 Section 806 (33 U.S.C. 3205) is amended—

21 (1) in the matter before paragraph (1), by  
22 striking “The Administrator shall” and all that fol-  
23 lows through “establish or maintain” and inserting  
24 the following:

1       “(a) IN GENERAL.—The Administrator shall, in con-  
2 sultation with such other Federal agencies, State, tribal,  
3 and territorial governments, and academic institutions as  
4 the Administrator considers appropriate, the coordinating  
5 committee under section 805(d), and the panel under sec-  
6 tion 808(a), support or maintain”;

7           (2) in subsection (a), as designated by para-  
8 graph (1), by striking “and assessment for tsunami  
9 tracking and numerical forecast modeling. Such re-  
10 search program shall—” and inserting the following:  
11 “assessment for tsunami tracking and numerical  
12 forecast modeling, and standards development.

13       “(b) RESPONSIBILITIES.—The research program  
14 supported or maintained under subsection (a) shall—”;  
15 and

16           (3) in subsection (b), as designated by para-  
17 graph (2)—

18           (A) by amending paragraph (1) to read as  
19 follows:

20           “(1) consider other appropriate and cost effec-  
21 tive solutions to mitigate the impact of tsunami, in-  
22 cluding the improvement of near-field and distant  
23 tsunami detection and forecasting capabilities, which  
24 may include use of a new generation of the Deep-  
25 Ocean Assessment and Reporting of Tsunamis



1 array, integration of tsunami sensors into commer-  
2 cial and Federal telecommunications cables, and  
3 other real-time tsunami monitoring systems and  
4 supercomputer capacity of the Administration to de-  
5 velop a rapid tsunami forecast for all United States  
6 coastlines;”;

7 (B) in paragraph (3)—

8 (i) by striking “include” and inserting  
9 “conduct”; and

10 (ii) by striking “and” at the end;

11 (C) by redesignating paragraph (4) as  
12 paragraph (5);

13 (D) by inserting after paragraph (3) the  
14 following:

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

18 (E) in paragraph (5), as redesignated by  
19 subparagraph (C), by striking “to the scientific  
20 community,” and inserting “to the public and  
21 the scientific community.”.

22 **SEC. 7. GLOBAL TSUNAMI WARNING AND MITIGATION NET-**  
23 **WORK.**

24 Section 807 (33 U.S.C. 3206) is amended—

1           (1) by amending subsection (a) to read as fol-  
2           lows:

3           “(a) SUPPORT FOR DEVELOPMENT OF AN INTER-  
4 NATIONAL TSUNAMI WARNING SYSTEM.—The Adminis-  
5 trator shall, in coordination with the Secretary of State  
6 and in consultation with such other agencies as the Ad-  
7 ministrator considers relevant, provide technical assist-  
8 ance, operational support, and training to the Intergovern-  
9 mental Oceanographic Commission of the United Nations  
10 Educational, Scientific, and Cultural Organization, the  
11 World Meteorological Organization of the United Nations,  
12 and such other international entities as the Administrator  
13 considers appropriate, as part of the international efforts  
14 to develop a fully functional global tsunami forecast and  
15 warning system comprised of regional tsunami warning  
16 networks.”;

17           (2) in subsection (b), by striking “shall” both  
18           places that term appears and inserting “may”; and

19           (3) in subsection (c)—

20                   (A) in paragraph (1), by striking “estab-  
21                   lishing” and inserting “supporting”; and

22                   (B) in paragraph (2)—

23                           (i) by striking “establish” and insert-  
24                           ing “support”; and

1 (ii) by striking “establishing” and in-  
2 serting “supporting”.

3 **SEC. 8. TSUNAMI SCIENCE AND TECHNOLOGY ADVISORY**

4 **PANEL.**

5 The Act is further amended—

6 (1) by redesignating section 808 (33 U.S.C.  
7 3207) as section 809; and

8 (2) by inserting after section 807 (33 U.S.C.  
9 3206) the following:

10 **“SEC. 808. TSUNAMI SCIENCE AND TECHNOLOGY ADVISORY**

11 **PANEL.**

12 “(a) DESIGNATION.—The Administrator shall des-  
13 ignate an existing working group within the Science Advi-  
14 sory Board of the Administration to serve as the Tsunami  
15 Science and Technology Advisory Panel to provide advice  
16 to the Administrator on matters regarding tsunami  
17 science, technology, and regional preparedness.

18 “(b) MEMBERSHIP.—

19 “(1) COMPOSITION.—The Panel shall be com-  
20 posed of no fewer than 7 members selected by the  
21 Administrator from among individuals from aca-  
22 demia or State agencies who have academic or prac-  
23 tical expertise in physical sciences, social sciences,  
24 information technology, coastal resilience, emergency

1 management, or such other disciplines as the Ad-  
2 ministrator considers appropriate.

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

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

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

11 “(2) submit to the Administrator and such oth-  
12 ers as the Administrator considers appropriate—

13 “(A) the findings of the Panel with respect  
14 to the most recent review conducted under  
15 paragraph (1); and

16 “(B) such recommendations for legislative  
17 or administrative action as the Panel considers  
18 appropriate to improve Federal tsunami re-  
19 search, detection, forecasting, warning, mitiga-  
20 tion, resiliency, and preparation.

21 “(d) REPORTS TO CONGRESS.—Not less frequently  
22 than once every 4 years, the Administrator shall submit  
23 to the Committee on Commerce, Science, and Transpor-  
24 tation of the Senate and the Committee on Science, Space,  
25 and Technology of the House of Representatives a report

1 on the findings and recommendations received by the Ad-  
2 ministrator under subsection (c)(2).”.

3 **SEC. 9. REPORTS.**

4 (a) REPORT ON IMPLEMENTATION OF TSUNAMI  
5 WARNING AND EDUCATION ACT.—

6 (1) IN GENERAL.—Not later than 1 year after  
7 the date of the enactment of this Act, the Adminis-  
8 trator of the National Oceanic and Atmospheric Ad-  
9 ministration shall submit to Congress a report on  
10 the implementation of the Tsunami Warning and  
11 Education Act, as enacted as title VIII of Public  
12 Law 109–479 (33 U.S.C. 3201 et seq.).

13 (2) ELEMENTS.—The report required by para-  
14 graph (1) shall include the following:

15 (A) A detailed description of the progress  
16 made in implementing sections 804(d)(6),  
17 805(b)(6), and 806(b)(4) of the Tsunami  
18 Warning and Education Act, as enacted as title  
19 VIII of Public Law 109–479 (33 U.S.C. 3201  
20 et seq.).

21 (B) A description of the ways that tsunami  
22 warnings and warning products issued by the  
23 program for tsunami forecasting and warning  
24 established under section 804 of such Tsunami  
25 Warning and Education Act (33 U.S.C. 3203)

1           may be standardized and streamlined with  
2           warnings and warning products for hurricanes,  
3           coastal storms, and other coastal flooding  
4           events.

5           (b) REPORT ON NATIONAL EFFORTS THAT SUPPORT  
6 RAPID EMERGENCY RESPONSE FOLLOWING NEAR-FIELD  
7 TSUNAMI EVENTS.—

8           (1) IN GENERAL.—Not later than 1 year after  
9           the date of the enactment of this Act, the Adminis-  
10          trator of the National Oceanic and Atmospheric Ad-  
11          ministration and the Secretary of Homeland Secu-  
12          rity shall jointly, in coordination with the Director of  
13          the United States Geological Survey, the Com-  
14          mandant of the Coast Guard, the Commander of the  
15          United States Northern Command, the Adminis-  
16          trator of the Federal Emergency Management Agen-  
17          cy, the Chief of the National Guard Bureau, and the  
18          heads of such other Federal agencies as the Admin-  
19          istrator considers appropriate, submit to the appro-  
20          priate committees of Congress a report on the na-  
21          tional efforts in effect on the day before the date of  
22          the enactment of this Act that support and facilitate  
23          rapid emergency response following a domestic near-  
24          shore near-field tsunami event to better understand  
25          domestic effects of earthquake derived tsunami on

1 people, infrastructure, communities, and coastal  
2 economies in the United States.

3 (2) ELEMENTS.—The report required by para-  
4 graph (1) shall include the following:

5 (A) A description of scientific or other  
6 measurements being collected on the day before  
7 the date of the enactment of this Act which  
8 allow for the quick identification and assess-  
9 ment of lost or degraded infrastructure and ter-  
10 restrial formations post disaster.

11 (B) A description of scientific or other  
12 measurements necessary to quickly identify and  
13 quantify lost or degraded infrastructure and  
14 terrestrial formations.

15 (C) Identification and evaluation of Fed-  
16 eral, State, local, tribal, territorial, and military  
17 first responder and search and rescue operation  
18 centers, bases, and other facilities as well as  
19 other critical response assets and infrastruc-  
20 ture, including search and rescue aircraft and  
21 vessels, located within, and adjacent to, near-  
22 field and distant tsunami inundation areas on  
23 the day before the date of the enactment of this  
24 Act.

1           (D) An evaluation of Federal, State, and  
2 local near-field tsunami response plans in areas  
3 described in subparagraph (C) in effect on the  
4 day before the date of the enactment of this  
5 Act, how those response plans would be affected  
6 by the loss of search and rescue and first re-  
7 sponder infrastructure described in such sub-  
8 paragraph.

9           (E) A description of redevelopment plans  
10 and reports in effect on the day before the date  
11 of the enactment of this Act for communities in  
12 areas that are at high risk for near-field tsu-  
13 nami, as well as identification of States or com-  
14 munities that do not have redevelopment plans.

15           (F) Recommendations to enhance near-  
16 field tsunami preparedness and response plans,  
17 including recommended responder exercises,  
18 predisaster planning, mitigation needs and rec-  
19 ommendations to enhance coordination between  
20 Federal, State, and local response agencies.

21           (G) Such other data and analysis informa-  
22 tion as the Administrator and the Secretary of  
23 Homeland Security consider appropriate.



1           (3) APPROPRIATE COMMITTEES OF CON-  
2           GRESS.—In this subsection, the term “appropriate  
3           committees of Congress” means—

4                   (A) the Committee on Commerce, Science,  
5                   and Transportation and the Committee on  
6                   Homeland Security and Governmental Affairs  
7                   of the Senate; and

8                   (B) the Committee on Science, Space, and  
9                   Technology and the Committee on Homeland  
10                  Security of the House of Representatives.

11 **SEC. 10. AUTHORIZATION OF APPROPRIATIONS.**

12           Section 809, as redesignated by section 8(1) of this  
13 Act, is amended—

14                   (1) in paragraph (4)(B), by striking “and” at  
15                   the end;

16                   (2) in paragraph (5)(B), by striking the period  
17                   at the end and inserting “; and”; and

18                   (3) by adding at the end the following:

19                   “(6) \$31,500,000 for each of fiscal years 2017  
20                   through 2021, of which—

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

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

4 **SEC. 11. OUTREACH RESPONSIBILITIES.**

5           The Administrator of the National Oceanic and At-  
6 mospheric Administration, in coordination with State and  
7 local emergency managers, shall develop and carry out for-  
8 mal outreach activities to improve tsunami education and  
9 awareness and foster the development of resilient commu-  
10 nities. Outreach activities may include—

11                   (1) the development of outreach plans to ensure  
12                   the close integration of tsunami warning centers  
13                   supported or maintained under section 804(d) of the  
14                   Tsunami Warning and Education Act enacted as  
15                   title VIII of Public Law 109–479 (33 U.S.C. 3201  
16                   et seq.), (33 U.S.C. 3203(d)) with local Weather  
17                   Forecast Offices of the National Weather Service  
18                   and emergency managers;

19                   (2) working with appropriate local Weather  
20                   Forecast Offices to ensure they have the technical  
21                   knowledge and capability to disseminate tsunami  
22                   warnings to the communities they serve; and

23                   (3) evaluating the effectiveness of warnings and  
24                   of coordination with local Weather Forecast Offices  
25                   after significant tsunami events.

1 **SEC. 12. MODIFICATION OF COASTAL OCEAN PROGRAM.**

2 Section 201(c) of the National Oceanic and Atmos-  
3 pheric Administration Authorization Act of 1992 (Public  
4 Law 102–567) is amended—

5 (1) by striking “Of the sums” and inserting the  
6 following:

7 “(1) IN GENERAL.—Of the sums”; and

8 (2) by adding at the end the following:

9 “(2) REGIONAL COASTAL RISK MANAGEMENT  
10 COALITIONS.—The Administrator of the National  
11 Oceanic and Atmospheric Administration may form  
12 regional coastal risk management coalitions com-  
13 prised of representatives of Federal, State, local, and  
14 tribal governments, community groups, academic in-  
15 stitutions, and nongovernmental groups to advance  
16 the goals of this section for communities facing com-  
17 mon coastal hazards and risks. Such coalitions may  
18 enter into an agreement with an organization de-  
19 scribed in section 501(c)(3) of the Internal Revenue  
20 Code of 1986 to establish a nonprofit foundation in  
21 order to accept gifts and donations to support the  
22 goals of this subsection.”.

23 **SEC. 13. REPEAL OF DUPLICATE PROVISIONS.**

24 The Tsunami Warning and Education Act enacted by  
25 Public Law 109–424 (120 Stat. 2902) is repealed.

