

115TH CONGRESS  
1ST SESSION

# H. R. 312

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

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## IN THE HOUSE OF REPRESENTATIVES

JANUARY 5, 2017

Ms. BONAMICI (for herself, Mr. ROHRABACHER, Ms. BEUTLER, Mr. YOUNG of Alaska, Mr. CRIST, Ms. EDDIE BERNICE JOHNSON of Texas, Mr. ISSA, Mr. DEFazio, and Ms. JAYAPAL) introduced the following bill; which was referred to the Committee on Science, Space, and Technology

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## 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 (Public Law 109–424; 33 U.S.C. 3201 et  
9 seq.).

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

12 Section 3 (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  
18 United States Tsunami Warning System to increase  
19 the accuracy of forecasts and warnings, to ensure  
20 full coverage of tsunami threats to the United States  
21 with a network of detection assets, and to reduce  
22 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, mitigation, resiliency, response, outreach,  
11 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 redesign-  
23 ated, 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 4 (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 4 (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 (7) through  
13 (9) as paragraphs (8) through (10), respectively;

14 (3) by redesignating paragraphs (2) through  
15 (6) as paragraphs (3) through (7), respectively;

16 (4) by inserting after paragraph (1) the fol-  
17 lowing:

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

22 (5) by amending paragraph (5), as redesignated  
23 by paragraph (3), to read as follows:

24 “(5) provide tsunami forecasting capability  
25 based on models and measurements, including tsu-  
26 nami inundation models and maps for use in in-

1       creasing the preparedness of communities and safe-  
2       guarding port and harbor operations, that incor-  
3       porate inputs, including—

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

6               “(B) the global Earth observing system;

7               “(C) the global seismic network;

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

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

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

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

17       (6) by amending paragraph (7), as redesignated  
18       by paragraph (3), to read as follows:

19              “(7) include a cooperative effort among the Ad-  
20              ministration, the United States Geological Survey,  
21              and the National Science Foundation under which  
22              the Director of the United States Geological Survey  
23              and the Director of the National Science Foundation  
24              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 (7) 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 (8) 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 4 (33 U.S.C. 3203(c)) is amended to read as fol-  
3 lows:

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 4 (33 U.S.C. 3203(d)) is amended to read as  
3 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 (c). The Cen-  
8 ters 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) Evaluating earthquakes, landslides,  
4 and volcanic eruptions that have the potential  
5 to generate tsunami.

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

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

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

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

23 “(G) Coordinating with the tsunami haz-  
24 ard mitigation program conducted under section  
25 5 to ensure ongoing sharing of information be-

1           between forecasters and emergency management  
2           officials.

3           “(H) In coordination with the Coast  
4           Guard, evaluating and recommending proce-  
5           dures for ports and harbors at risk of tsunami  
6           inundation, including review of readiness, re-  
7           sponse, and communication strategies, and data  
8           sharing policies, to the maximum extent prac-  
9           ticable.

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

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

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

23           “(4) COORDINATION WITH NATIONAL WEATHER  
24           SERVICE.—The Administrator shall coordinate with  
25           the forecast offices of the National Weather Service,

1 the centers supported or maintained under para-  
2 graph (1), and such program offices of the Adminis-  
3 tration as the Administrator or the coordinating  
4 committee, as established in section 5(d), consider  
5 appropriate to ensure that regional and local fore-  
6 cast offices—

7 “(A) have the technical knowledge and ca-  
8 pability to disseminate tsunami warnings for  
9 the communities they serve;

10 “(B) leverage connections with local emer-  
11 gency management officials for optimally dis-  
12 seminating tsunami warnings and forecasts;  
13 and

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

24 “(5) UNIFORM OPERATING PROCEDURES.—The  
25 Administrator shall—

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

8 “(B) ensure that processes and products of  
9 the warning system operated under subsection  
10 (c)—

11 “(i) reflect industry best practices  
12 when practicable;

13 “(ii) conform to the maximum extent  
14 practicable with internationally recognized  
15 standards for information technology; and

16 “(iii) conform to the maximum extent  
17 practicable with other warning products  
18 and practices of the National Weather  
19 Service;

20 “(C) ensure that future adjustments to  
21 operational protocols, processes, and warning  
22 products—

23 “(i) are made consistently across the  
24 warning system operated under subsection  
25 (c); and

1 “(ii) are applied in a uniform manner  
2 across such warning system;

3 “(D) establish a systematic method for in-  
4 formation technology product development to  
5 improve long-term technology planning efforts;  
6 and

7 “(E) disseminate guidelines and metrics  
8 for evaluating and improving tsunami forecast  
9 models.

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

18 (e) TRANSFER OF TECHNOLOGY; MAINTENANCE AND  
19 UPGRADES.—Subsection (e) of section 4 (33 U.S.C.  
20 3203(e)) is amended to read as follows:

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

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

1           “(A) provisions for multipurpose detection  
2           platforms;

3           “(B) reliability and performance metrics;  
4           and

5           “(C) to the maximum extent practicable,  
6           requirements for the integration of equipment  
7           with other United States and global ocean and  
8           coastal observation systems, the global Earth  
9           observing system of systems, the global seismic  
10          networks, and the Advanced National Seismic  
11          System;

12          “(2) develop and execute a plan for the transfer  
13          of technology from ongoing research conducted as  
14          part of the program supported or maintained under  
15          section 6 into the program under this section; and

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

19          (f) FEDERAL COOPERATION.—Subsection (f) of sec-  
20          tion 4 (33 U.S.C. 3203(f)) is amended to read as follows:

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

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

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

3           “(A) to acquire the agency’s assistance;  
4       and

5           “(B) to prioritize the necessary assets in  
6       support of the tsunami forecast and warning  
7       program.”.

8       (g) UNNECESSARY PROVISIONS.—Section 4 (33  
9 U.S.C. 3203) is further amended—

10           (1) by striking subsection (g);

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

12           (3) by redesignating subsection (h) as sub-  
13       section (g).

14       (h) CONGRESSIONAL NOTIFICATIONS.—Subsection  
15 (g) of section 4 (33 U.S.C. 3203(g)), as redesignated by  
16 subsection (g)(3), is amended—

17           (1) by redesignating paragraphs (1) and (2) as  
18       subparagraphs (A) and (B), respectively, and mov-  
19       ing such subparagraphs 2 ems to the right;

20           (2) in the matter before subparagraph (A), as  
21       redesignated by paragraph (2), by striking “The Ad-  
22       ministrator” and inserting the following:

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

24           (3) in paragraph (1), as redesignated by para-  
25       graph (3)—

1 (A) in subparagraph (A), as redesignated  
2 by paragraph (2), by striking “and” at the end;

3 (B) in subparagraph (B), as redesignated  
4 by paragraph (2), by striking the period at the  
5 end and inserting “; and”; and

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

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

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

10 “(2) CONTENTS.—In a case in which notice is  
11 submitted under paragraph (1) within 30 days of a  
12 significant tsunami warning described in subpara-  
13 graph (C) of such paragraph, such notice shall in-  
14 clude, as appropriate, brief information and analysis  
15 of—

16 “(A) the accuracy of the tsunami model  
17 used;

18 “(B) the specific deep ocean or other moni-  
19 toring equipment that detected the incident, as  
20 well as the deep ocean or other monitoring  
21 equipment that did not detect the incident due  
22 to malfunction or other reasons;

23 “(C) the effectiveness of the warning com-  
24 munication, including the dissemination of  
25 warnings with State, territory, local, and tribal



1           partners in the affected area under the jurisdic-  
2           tion of the National Weather Service; and

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

5   **SEC. 5. MODIFICATION OF NATIONAL TSUNAMI HAZARD**  
6                   **MITIGATION PROGRAM.**

7           (a) IN GENERAL.—Section 5(a) (33 U.S.C. 3204(a))  
8   is amended to read as follows:

9           “(a) PROGRAM REQUIRED.—The Administrator, in  
10   coordination with the Administrator of the Federal Emer-  
11   gency Management Agency and the heads of such other  
12   agencies as the Administrator considers relevant, shall  
13   conduct a community-based tsunami hazard mitigation  
14   program to improve tsunami preparedness and resiliency  
15   of at-risk areas in the United States and the territories  
16   of the United States.”.

17          (b) NATIONAL TSUNAMI HAZARD MITIGATION PRO-  
18   GRAM.—Section 5 (33 U.S.C. 3204) is amended by strik-  
19   ing subsections (c) and (d) and inserting the following:

20          “(c) PROGRAM COMPONENTS.—The Program con-  
21   ducted under subsection (a) shall include the following:

22               “(1) Technical and financial assistance to  
23           coastal States, territories, tribes, and local govern-  
24           ments to develop and implement activities under this  
25           section.

1           “(2) Integration of tsunami preparedness and  
2           mitigation programs into ongoing State-based haz-  
3           ard warning, resilience planning, and risk manage-  
4           ment activities, including predisaster planning, emer-  
5           gency response, evacuation planning, disaster recov-  
6           ery, hazard mitigation, and community development  
7           and redevelopment planning programs in affected  
8           areas.

9           “(3) Activities to promote the adoption of tsu-  
10          nami resilience, preparedness, warning, and mitiga-  
11          tion measures by Federal, State, territorial, tribal,  
12          and local governments and nongovernmental entities,  
13          including educational and risk communication pro-  
14          grams to discourage development in high-risk areas.

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

18               “(A) The sources, sizes, and other relevant  
19               historical data of tsunami in the region, includ-  
20               ing paleotsunami data.

21               “(B) Inundation models and maps of crit-  
22               ical infrastructure and socioeconomic vulner-  
23               ability in areas subject to tsunami inundation.

24               “(C) Maps of evacuation areas and evacu-  
25               ation routes, including, when appropriate, traf-

1           fic studies that evaluate the viability of evacu-  
2           ation routes.

3           “(D) Evaluations of the size of populations  
4           that will require evacuation, including popu-  
5           lations with special evacuation needs.

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

11          “(F) Evaluation of at-risk ports and har-  
12          bors.

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

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

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

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

24          “(6) Activities to support the development of  
25          community-based outreach and education programs

1 to ensure community readiness and resilience, in-  
2 cluding the following:

3 “(A) The development, implementation,  
4 and assessment of technical training and public  
5 education programs, including education pro-  
6 grams that address unique characteristics of  
7 distant and near-field tsunami.

8 “(B) The development of decision support  
9 tools.

10 “(C) The incorporation of social science re-  
11 search into community readiness and resilience  
12 efforts.

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

15 “(7) Dissemination of guidelines and standards  
16 for community planning, education, and training  
17 products, programs, and tools, including—

18 “(A) standards for—

19 “(i) mapping products;

20 “(ii) inundation models; and

21 “(iii) effective emergency exercises;

22 and

23 “(B) recommended guidance for at-risk  
24 port and harbor tsunami warning, evacuation,

1           and response procedures in coordination with  
2           the Coast Guard.

3           “(d) AUTHORIZED ACTIVITIES.—In addition to ac-  
4           tivities conducted under subsection (c), the program con-  
5           ducted under subsection (a) may include the following:

6                   “(1) Multidisciplinary vulnerability assessment  
7           research, education, and training to help integrate  
8           risk management and resilience objectives with com-  
9           munity development planning and policies.

10                   “(2) Risk management training for local offi-  
11           cials and community organizations to enhance un-  
12           derstanding and preparedness.

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

16                   “(4) Development of practical applications for  
17           existing or emerging technologies, such as modeling,  
18           remote sensing, geospatial technology, engineering,  
19           and observing systems, including the integration of  
20           tsunami sensors into Federal and commercial sub-  
21           marine telecommunication cables if practicable.

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

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

1           “(B) development and maintenance of new  
2           integrated data products to support risk man-  
3           agement, risk assessment, and resilience pro-  
4           grams.

5           “(6) Risk notification systems that coordinate  
6           with and build upon existing systems and actively  
7           engage decisionmakers, State, local, tribal, and terri-  
8           torial governments and agencies, business commu-  
9           nities, nongovernmental organizations, and the  
10          media.

11          “(e) NO PREEMPTION WITH RESPECT TO DESIGNA-  
12          TION OF AT-RISK AREAS.—The establishment of national  
13          standards for inundation models under this section shall  
14          not prevent States, territories, tribes, and local govern-  
15          ments from designating additional areas as being at risk  
16          based on knowledge of local conditions.

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

20          “(c) REPORT ON ACCREDITATION OF TSUNAMIREADY  
21          PROGRAM.—Not later than 180 days after the date of en-  
22          actment of this Act, the Administrator of the National  
23          Oceanic and Atmospheric Administration shall submit to  
24          the Committee on Commerce, Science, and Transportation  
25          of the Senate and the Committee on Science, Space, and

1 Technology of the House of Representatives a report on  
2 which authorities and activities would be needed to have  
3 the TsunamiReady program of the National Weather  
4 Service accredited by the Emergency Management Accred-  
5 itation Program.

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

7 Section 6 (33 U.S.C. 3205) is amended—

8 (1) in the matter before paragraph (1), by  
9 striking “The Administrator shall” and all that fol-  
10 lows through “establish or maintain” and inserting  
11 the following:

12 “(a) IN GENERAL.—The Administrator shall, in con-  
13 sultation with such other Federal agencies, State, tribal,  
14 and territorial governments, and academic institutions as  
15 the Administrator considers appropriate, the coordinating  
16 committee under section 5(d), and the panel under section  
17 8(a), support or maintain”;

18 (2) in subsection (a), as designated by para-  
19 graph (1), by striking “and assessment for tsunami  
20 tracking and numerical forecast modeling. Such re-  
21 search program shall—” and inserting the following:  
22 “assessment for tsunami tracking and numerical  
23 forecast modeling, and standards development.

1 “(b) RESPONSIBILITIES.—The research program  
2 supported or maintained under subsection (a) shall—”;  
3 and

4 (3) in subsection (b), as designated by para-  
5 graph (2)—

6 (A) by amending paragraph (1) to read as  
7 follows:

8 “(1) consider other appropriate and cost effec-  
9 tive solutions to mitigate the impact of tsunami, in-  
10 cluding the improvement of near-field and distant  
11 tsunami detection and forecasting capabilities, which  
12 may include use of a new generation of the Deep-  
13 ocean Assessment and Reporting of Tsunamis array,  
14 integration of tsunami sensors into commercial and  
15 Federal telecommunications cables, and other real-  
16 time tsunami monitoring systems and supercomputer  
17 capacity of the Administration to develop a rapid  
18 tsunami forecast for all United States coastlines;”;

19 (B) in paragraph (3)—

20 (i) by striking “include” and inserting  
21 “conduct”; and

22 (ii) by striking “and” at the end;

23 (C) by redesignating paragraph (4) as  
24 paragraph (5);



1 (D) by inserting after paragraph (3) the  
2 following:

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

6 (E) in paragraph (5), as redesignated by  
7 subparagraph (C), by striking “to the scientific  
8 community” and inserting “to the public and  
9 the scientific community”.

10 **SEC. 7. GLOBAL TSUNAMI WARNING AND MITIGATION NET-**  
11 **WORK.**

12 Section 7 (33 U.S.C. 3206) is amended—

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

15 “(a) SUPPORT FOR DEVELOPMENT OF AN INTER-  
16 NATIONAL TSUNAMI WARNING SYSTEM.—The Adminis-  
17 trator shall, in coordination with the Secretary of State  
18 and in consultation with such other agencies as the Ad-  
19 ministrator considers relevant, provide technical assist-  
20 ance, operational support, and training to the Intergovern-  
21 mental Oceanographic Commission of the United Nations  
22 Educational, Scientific, and Cultural Organization, the  
23 World Meteorological Organization of the United Nations,  
24 and such other international entities as the Administrator  
25 considers appropriate, as part of the international efforts

1 to develop a fully functional global tsunami forecast and  
 2 warning system comprised of regional tsunami warning  
 3 networks.”;

4 (2) in subsection (b), by striking “shall” each  
 5 place it appears and inserting “may”; and

6 (3) in subsection (c)—

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

9 (B) in paragraph (2)—

10 (i) by striking “establish” and insert-  
 11 ing “support”; and

12 (ii) by striking “establishing” and in-  
 13 serting “supporting”.

14 **SEC. 8. TSUNAMI SCIENCE AND TECHNOLOGY ADVISORY**  
 15 **PANEL.**

16 (a) IN GENERAL.—The Act is further amended—

17 (1) by redesignating section 8 (33 U.S.C. 3207)  
 18 as section 9; and

19 (2) by inserting after section 7 (33 U.S.C.  
 20 3206) the following:

21 **“SEC. 8. TSUNAMI SCIENCE AND TECHNOLOGY ADVISORY**  
 22 **PANEL.**

23 “(a) DESIGNATION.—The Administrator shall des-  
 24 ignate an existing working group within the Science Advi-  
 25 sory Board of the Administration to serve as the Tsunami

1 Science and Technology Advisory Panel to provide advice  
2 to the Administrator on matters regarding tsunami  
3 science, technology, and regional preparedness.

4 “(b) MEMBERSHIP.—

5 “(1) COMPOSITION.—The Panel shall be com-  
6 posed of no fewer than 7 members selected by the  
7 Administrator from among individuals from aca-  
8 demia or State agencies who have academic or prac-  
9 tical expertise in physical sciences, social sciences,  
10 information technology, coastal resilience, emergency  
11 management, or such other disciplines as the Ad-  
12 ministrator considers appropriate.

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

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

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

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

23 “(A) the findings of the working group  
24 with respect to the most recent review con-  
25 ducted under paragraph (1); and

1           “(B) such recommendations for legislative  
 2           or administrative action as the working group  
 3           considers appropriate to improve Federal tsu-  
 4           nami research, detection, forecasting, warning,  
 5           mitigation, resiliency, and preparation.

6           “(d) REPORTS TO CONGRESS.—Not less frequently  
 7           than once every 4 years, the Administrator shall submit  
 8           to the Committee on Commerce, Science, and Transpor-  
 9           tation of the Senate, and the Committee on Science,  
 10          Space, and Technology of the House of Representatives  
 11          a report on the findings and recommendations received by  
 12          the Administrator under subsection (c)(2).”.

13   **SEC. 9. REPORTS.**

14          (a) REPORT ON IMPLEMENTATION OF TSUNAMI  
 15          WARNING AND EDUCATION ACT.—

16               (1) IN GENERAL.—Not later than 1 year after  
 17          the date of the enactment of this Act, the Adminis-  
 18          trator of the National Oceanic and Atmospheric Ad-  
 19          ministration shall submit to Congress a report on  
 20          the implementation of the Tsunami Warning and  
 21          Education Act (33 U.S.C. 3201 et seq.).

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

24                       (A) A detailed description of the progress  
 25                       made in implementing sections 4(d)(6), 5(b)(6),

1 and 6(b)(4) of the Tsunami Warning and Edu-  
2 cation Act.

3 (B) A description of the ways that tsunami  
4 warnings and warning products issued by the  
5 Tsunami Forecasting and Warning Program es-  
6 tablished under section 4 of the Tsunami Warn-  
7 ing and Education Act (33 U.S.C. 3203) can be  
8 standardized and streamlined with warnings  
9 and warning products for hurricanes, coastal  
10 storms, and other coastal flooding events.

11 (b) REPORT ON NATIONAL EFFORTS THAT SUPPORT  
12 RAPID RESPONSE FOLLOWING NEAR-SHORE TSUNAMI  
13 EVENTS.—

14 (1) IN GENERAL.—Not later than 1 year after  
15 the date of the enactment of this Act, the Adminis-  
16 trator and the Secretary of Homeland Security shall  
17 jointly, in coordination with the Director of the  
18 United States Geological Survey, Administrator of  
19 the Federal Emergency Management Agency, the  
20 Chief of the National Guard Bureau, and the heads  
21 of such other Federal agencies as the Administrator  
22 considers appropriate, submit to the appropriate  
23 committees of Congress a report on the national ef-  
24 forts in effect on the day before the date of the en-  
25 actment of this Act that support and facilitate rapid

1 emergency response following a domestic near-shore  
2 tsunami event to better understand domestic effects  
3 of earthquake derived tsunami on people, infrastruc-  
4 ture, and communities in the United States.

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

7 (A) A description of scientific or other  
8 measurements collected on the day before the  
9 date of the enactment of this Act to quickly  
10 identify and quantify lost or degraded infra-  
11 structure or terrestrial formations.

12 (B) A description of scientific or other  
13 measurements that would be necessary to col-  
14 lect to quickly identify and quantify lost or de-  
15 graded infrastructure or terrestrial formations.

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

1           (D) An evaluation of near-shore tsunami  
2           response plans in areas described in subpara-  
3           graph (C) in effect on the day before the date  
4           of the enactment of this Act, and how those re-  
5           sponse plans would be affected by the loss of  
6           search and rescue and first responder infra-  
7           structure described in such subparagraph.

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

14          (F) Recommendations to enhance near-  
15          shore tsunami preparedness and response plans,  
16          including recommended responder exercises,  
17          predisaster planning, and mitigation needs.

18          (G) Such other data and analysis informa-  
19          tion as the Administrator and the Secretary of  
20          Homeland Security consider appropriate.

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

24                 (A) the Committee on Commerce, Science,  
25                 and Transportation and the Committee on

1 Homeland Security and Governmental Affairs  
2 of the Senate; and

3 (B) the Committee on Science, Space, and  
4 Technology and the Committee on Homeland  
5 Security of the House of Representatives.

6 **SEC. 10. AUTHORIZATION OF APPROPRIATIONS.**

7 Section 9 of the Act, as redesignated by section  
8 8(a)(1) of this Act, is amended—

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

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

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

14 “(6) \$31,700,000 for each of fiscal years 2017  
15 through 2021, of which—

16 “(A) not less than 27 percent of the  
17 amount appropriated for each fiscal year shall  
18 be for activities conducted at the State level  
19 under the tsunami hazard mitigation program  
20 under section 5; and

21 “(B) not less than 8 percent of the amount  
22 appropriated shall be for the tsunami research  
23 program under section 6.”.



1 **SEC. 11. OUTREACH RESPONSIBILITIES.**

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

- 8           (1) the development of outreach plans to ensure  
9       the close integration of tsunami warning centers  
10      supported or maintained under section 4(d) of the  
11      Tsunami Warning and Education Act (33 U.S.C.  
12      3203(d)) with local Weather Forecast Offices of the  
13      National Weather Service and emergency managers;  
14      (2) working with appropriate local Weather  
15      Forecast Offices to ensure they have the technical  
16      knowledge and capability to disseminate tsunami  
17      warnings to the communities they serve; and  
18      (3) evaluating the effectiveness of warnings and  
19      of coordination with local Weather Forecast Offices  
20      after significant tsunami events.

21 **SEC. 12. REPEAL OF DUPLICATE PROVISIONS OF LAW.**

22      (a) REPEAL.—The Magnuson-Stevens Fishery Con-  
23 servation and Management Reauthorization Act of 2006  
24 (Public Law 109–479) is amended by striking title VIII  
25 (relating to tsunami warning and education).

1       (b) CONSTRUCTION.—Nothing in this section shall be  
2 construed to repeal, or affect in any way, Public Law 109–  
3 424.

