

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.

