

109<sup>TH</sup> CONGRESS  
2<sup>D</sup> SESSION

# H. R. 1674

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IN THE SENATE OF THE UNITED STATES

DECEMBER 6, 2006

Received

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## AN ACT

To authorize and strengthen the tsunami detection, forecast, warning, and mitigation program of the National Oceanic and Atmospheric Administration, to be carried out by the National Weather Service, 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,*

1 **SECTION 1. SHORT TITLE.**

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

4 **SEC. 2. DEFINITIONS.**

5 In this Act:

6 (1) The term “Administration” means the Na-  
7 tional Oceanic and Atmospheric Administration.

8 (2) The term “Administrator” means the Ad-  
9 ministrator of the National Oceanic and Atmos-  
10 pheric Administration.

11 **SEC. 3. PURPOSES.**

12 The purposes of this Act are—

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

16 (2) to enhance and modernize the existing Pa-  
17 cific Tsunami Warning System to increase coverage,  
18 reduce false alarms, and increase the accuracy of  
19 forecasts and warnings, and to expand detection and  
20 warning systems to include other vulnerable States  
21 and United States territories, including the Atlantic  
22 Ocean, Caribbean Sea, and Gulf of Mexico areas;

23 (3) to improve mapping, modeling, research,  
24 and assessment efforts to improve tsunami detection,  
25 forecasting, warnings, notification, outreach, mitiga-  
26 tion, response, and recovery;

1           (4) to improve and increase education and out-  
2 reach activities and ensure that those receiving tsu-  
3 nami warnings and the at-risk public know what to  
4 do when a tsunami is approaching;

5           (5) to provide technical and other assistance to  
6 speed international efforts to establish regional tsu-  
7 nami warning systems in vulnerable areas worldwide,  
8 including the Indian Ocean; and

9           (6) to improve Federal, State, and international  
10 coordination for detection, warnings, and outreach  
11 for tsunami and other coastal impacts.

12 **SEC. 4. TSUNAMI FORECASTING AND WARNING PROGRAM.**

13       (a) IN GENERAL.—The Administrator, through the  
14 National Weather Service and in consultation with other  
15 relevant Administration offices, shall operate a program  
16 to provide tsunami detection, forecasting, and warnings  
17 for the Pacific and Arctic Ocean regions and for the Atlan-  
18 tic Ocean, Caribbean Sea, and Gulf of Mexico region.

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

21           (1) include the tsunami warning centers estab-  
22 lished under subsection (d);

23           (2) utilize and maintain an array of robust tsu-  
24 nami detection technologies;

1           (3) maintain detection equipment in operational  
2           condition to fulfill the detection, forecasting, and  
3           warning requirements of this Act;

4           (4) provide tsunami forecasting capability based  
5           on models and measurements, including tsunami in-  
6           undation models and maps for use in increasing the  
7           preparedness of communities, including through the  
8           TsunamiReady program;

9           (5) maintain data quality and management sys-  
10          tems to support the requirements of the program;

11          (6) include a cooperative effort among the Ad-  
12          ministration, the United States Geological Survey,  
13          and the National Science Foundation under which  
14          the Geological Survey and the National Science  
15          Foundation shall provide rapid and reliable seismic  
16          information to the Administration from international  
17          and domestic seismic networks;

18          (7) provide a capability for the dissemination of  
19          warnings to at-risk States and tsunami communities  
20          through rapid and reliable notification to govern-  
21          ment officials and the public, including utilization of  
22          and coordination with existing Federal warning sys-  
23          tems, including the National Oceanic and Atmos-  
24          pheric Administration Weather Radio All Hazards  
25          Program;

1           (8) allow, as practicable, for integration of tsu-  
2           nami detection technologies with other environ-  
3           mental observing technologies; and

4           (9) include any technology the Administrator  
5           considers appropriate to fulfill the objectives of the  
6           program under this section.

7           (c) SYSTEM AREAS.—The program under this section  
8 shall operate—

9           (1) a Pacific tsunami warning system capable  
10          of forecasting tsunami anywhere in the Pacific and  
11          Arctic Ocean regions and providing adequate warn-  
12          ings; and

13          (2) an Atlantic Ocean, Caribbean Sea, and Gulf  
14          of Mexico tsunami warning system capable of fore-  
15          casting tsunami and providing adequate warnings in  
16          areas of the Atlantic Ocean, Caribbean Sea, and  
17          Gulf of Mexico that are determined—

18                 (A) to be geologically active, or to have sig-  
19                 nificant potential for geological activity; and

20                 (B) to pose significant risks of tsunami for  
21                 States along the coastal areas of the Atlantic  
22                 Ocean, Caribbean Sea, or Gulf of Mexico.

23          (d) TSUNAMI WARNING CENTERS.—

1           (1) IN GENERAL.—The Administrator, through  
2 the National Weather Service, shall maintain or es-  
3 tablish—

4           (A) a Pacific Tsunami Warning Center in  
5 Hawaii;

6           (B) a West Coast and Alaska Tsunami  
7 Warning Center in Alaska; and

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

11          (2) RESPONSIBILITIES.—The responsibilities of  
12 each tsunami warning center shall include—

13           (A) continuously monitoring data from  
14 seismological, deep ocean, and tidal monitoring  
15 stations;

16           (B) evaluating earthquakes that have the  
17 potential to generate tsunami;

18           (C) evaluating deep ocean buoy data and  
19 tidal monitoring stations for indications of tsu-  
20 nami resulting from earthquakes and other  
21 sources;

22           (D) disseminating forecasts and tsunami  
23 warning bulletins to Federal, State, and local  
24 government officials and the public;

1           (E) coordinating with the tsunami hazard  
2 mitigation program described in section 5 to en-  
3 sure ongoing sharing of information between  
4 forecasters and emergency management offi-  
5 cials; and

6           (F) making data gathered under this Act  
7 and post-warning analyses conducted by the  
8 National Weather Service or other relevant Ad-  
9 ministration offices available to researchers.

10       (e) **TRANSFER OF TECHNOLOGY; MAINTENANCE AND**  
11 **UPGRADES.—**

12           (1) **IN GENERAL.—**In carrying out this section,  
13 the National Weather Service, in consultation with  
14 other relevant Administration offices, shall—

15           (A) develop requirements for the equip-  
16 ment used to forecast tsunami, which shall in-  
17 clude provisions for multipurpose detection plat-  
18 forms, reliability and performance metrics, and  
19 to the maximum extent practicable how the  
20 equipment will be integrated with other United  
21 States and global ocean and coastal observation  
22 systems, the global earth observing system of  
23 systems, global seismic networks, and the Ad-  
24 vanced National Seismic System;

1           (B) develop and execute a plan for the  
2 transfer of technology from ongoing research  
3 described in section 6 into the program under  
4 this section; and

5           (C) ensure that maintaining operational  
6 tsunami detection equipment is the highest pri-  
7 ority within the program carried out under this  
8 Act.

9           (2) REPORT TO CONGRESS.—

10           (A) Not later than 1 year after the date of  
11 enactment of this Act, the National Weather  
12 Service, in consultation with other relevant Ad-  
13 ministration offices, shall transmit to Congress  
14 a report on how the tsunami forecast system  
15 under this section will be integrated with other  
16 United States and global ocean and coastal ob-  
17 servation systems, the global earth observing  
18 system of systems, global seismic networks, and  
19 the Advanced National Seismic System.

20           (B) Not later than 3 years after the date  
21 of enactment to this Act, the National Weather  
22 Service, in consultation with other relevant Ad-  
23 ministration offices, shall transmit a report to  
24 Congress on how technology developed under

1 section 6 is being transferred into the program  
2 under this section.

3 (f) FEDERAL COOPERATION.—When deploying and  
4 maintaining tsunami detection technologies, the Adminis-  
5 trator shall seek the assistance and assets of other appro-  
6 priate Federal agencies.

7 (g) ANNUAL EQUIPMENT CERTIFICATION.—At the  
8 same time Congress receives the budget justification docu-  
9 ments in support of the President’s annual budget request  
10 for each fiscal year, the Administrator shall transmit to  
11 the Committee on Commerce, Science, and Transportation  
12 of the Senate and the Committee on Science of the House  
13 of Representatives a certification that—

14 (1) identifies the tsunami detection equipment  
15 deployed pursuant to this Act, as of December 31 of  
16 the preceding calendar year;

17 (2) certifies which equipment is operational as  
18 of December 31 of the preceding calendar year;

19 (3) in the case of any piece of such equipment  
20 that is not operational as of such date, identifies  
21 that equipment and describes the mitigation strategy  
22 that is in place—

23 (A) to repair or replace that piece of equip-  
24 ment within a reasonable period of time; or

1 (B) to otherwise ensure adequate tsunami  
2 detection coverage;

3 (4) identifies any equipment that is being devel-  
4 oped or constructed to carry out this Act but which  
5 has not yet been deployed, if the Administration has  
6 entered into a contract for that equipment prior to  
7 December 31 of the preceding calendar year, and  
8 provides a schedule for the deployment of that  
9 equipment; and

10 (5) certifies that the Administrator expects the  
11 equipment described in paragraph (4) to meet the  
12 requirements, cost, and schedule provided in that  
13 contract.

14 (h) CONGRESSIONAL NOTIFICATIONS.—The Adminis-  
15 trator shall notify the Committee on Commerce, Science,  
16 and Transportation of the Senate and the Committee on  
17 Science of the House of Representatives within 30 days  
18 of—

19 (1) impaired regional forecasting capabilities  
20 due to equipment or system failures; and

21 (2) significant contractor failures or delays in  
22 completing work associated with the tsunami fore-  
23 casting and warning system.

24 (i) REPORT.—Not later than January 31, 2010, the  
25 Comptroller General of the United States shall transmit

1 a report to the Committee on Commerce, Science, and  
2 Transportation of the Senate and the Committee on  
3 Science of the House of Representatives that—

4           (1) evaluates the current status of the tsunami  
5           detection, forecasting, and warning system and the  
6           tsunami hazard mitigation program established  
7           under this Act, including progress toward tsunami  
8           inundation mapping of all coastal areas vulnerable to  
9           tsunami and whether there has been any degrada-  
10          tion of services as a result of the expansion of the  
11          program;

12          (2) evaluates the National Weather Service’s  
13          ability to achieve continued improvements in the de-  
14          livery of tsunami detection, forecasting, and warning  
15          services by assessing policies and plans for the evo-  
16          lution of modernization systems, models, and com-  
17          putational abilities (including the adoption of new  
18          technologies); and

19          (3) lists the contributions of funding or other  
20          resources to the program by other Federal agencies,  
21          particularly agencies participating in the program.

22          (j) **EXTERNAL REVIEW.**—The Administrator shall  
23          enter into an arrangement with the National Academy of  
24          Sciences to review the tsunami detection, forecast, and  
25          warning program established under this Act to assess fur-

1 ther modernization and coverage needs, as well as long-  
2 term operational reliability issues, taking into account  
3 measures implemented under this Act. The review shall  
4 also include an assessment of how well the forecast equip-  
5 ment has been integrated into other United States and  
6 global ocean and coastal observation systems and the glob-  
7 al earth observing system of systems. Not later than 2  
8 years after the date of enactment of this Act, the Adminis-  
9 trator shall transmit a report containing the National  
10 Academy of Sciences' recommendations, the Administra-  
11 tor's responses to the recommendations, including those  
12 where the Administrator disagrees with the Academy, a  
13 timetable to implement the accepted recommendations,  
14 and the cost of implementing all the Academy's rec-  
15 ommendations, to the Committee on Commerce, Science,  
16 and Transportation of the Senate and the Committee on  
17 Science of the House of Representatives.

18 (k) REPORT.—Not later than 3 months after the date  
19 of enactment of this Act, the Administrator shall establish  
20 a process for monitoring and certifying contractor per-  
21 formance in carrying out the requirements of any contract  
22 to construct or deploy tsunami detection equipment, in-  
23 cluding procedures and penalties to be imposed in cases  
24 of significant contractor failure or negligence.

1 **SEC. 5. NATIONAL TSUNAMI HAZARD MITIGATION PRO-**  
2 **GRAM.**

3 (a) IN GENERAL.—The Administrator, through the  
4 National Weather Service and in consultation with other  
5 relevant Administration offices, shall conduct a commu-  
6 nity-based tsunami hazard mitigation program to improve  
7 tsunami preparedness of at-risk areas in the United States  
8 and its territories.

9 (b) COORDINATING COMMITTEE.—In conducting the  
10 program under this section, the Administrator shall estab-  
11 lish a coordinating committee comprising representatives  
12 of Federal, State, local, and tribal government officials.  
13 The Administrator may establish subcommittees to ad-  
14 dress region-specific issues. The committee shall—

15 (1) recommend how funds appropriated for car-  
16 rying out the program under this section will be allo-  
17 cated;

18 (2) ensure that areas described in section 4(c)  
19 in the United States and its territories can have the  
20 opportunity to participate in the program;

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

1           (4) ensure that all components of the program  
2           are integrated with ongoing hazard warning and risk  
3           management activities, emergency response plans,  
4           and mitigation programs in affected areas, including  
5           integrating information to assist in tsunami evacu-  
6           ation route planning.

7           (c) PROGRAM COMPONENTS.—The program under  
8 this section shall—

9           (1) use inundation models that meet a standard  
10          of accuracy defined by the Administration to im-  
11          prove the quality and extent of inundation mapping,  
12          including assessment of vulnerable inner coastal and  
13          nearshore areas, in a coordinated and standardized  
14          fashion to maximize resources and the utility of data  
15          collected;

16          (2) promote and improve community outreach  
17          and education networks and programs to ensure  
18          community readiness, including the development of  
19          comprehensive coastal risk and vulnerability assess-  
20          ment training and decision support tools, implemen-  
21          tation of technical training and public education pro-  
22          grams, and providing for certification of prepared  
23          communities;

24          (3) integrate tsunami preparedness and mitiga-  
25          tion programs into ongoing hazard warning and risk

1 management activities, emergency response plans,  
2 and mitigation programs in affected areas, including  
3 integrating information to assist in tsunami evacu-  
4 ation route planning;

5 (4) promote the adoption of tsunami warning  
6 and mitigation measures by Federal, State, tribal,  
7 and local governments and nongovernmental entities,  
8 including educational programs to discourage devel-  
9 opment in high-risk areas; and

10 (5) provide for periodic external review of the  
11 program.

12 (d) SAVINGS CLAUSE.—Nothing in this section shall  
13 be construed to require a change in the chair of any exist-  
14 ing tsunami hazard mitigation program subcommittee.

15 **SEC. 6. TSUNAMI RESEARCH PROGRAM.**

16 The Administrator shall, in consultation with other  
17 agencies and academic institutions, and with the coordi-  
18 nating committee established under section 5(b), establish  
19 or maintain a tsunami research program to develop detec-  
20 tion, forecast, communication, and mitigation science and  
21 technology, including advanced sensing techniques, infor-  
22 mation and communication technology, data collection,  
23 analysis, and assessment for tsunami tracking and numer-  
24 ical forecast modeling. Such research program shall—

1           (1) consider other appropriate research to miti-  
2           gate the impact of tsunami;

3           (2) coordinate with the National Weather Serv-  
4           ice on technology to be transferred to operations;

5           (3) include social science research to develop  
6           and assess community warning, education, and evac-  
7           uation materials; and

8           (4) ensure that research and findings are avail-  
9           able to the scientific community.

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

12           (a) INTERNATIONAL TSUNAMI WARNING SYSTEM.—  
13 The Administrator, through the National Weather Service  
14 and in consultation with other relevant Administration of-  
15 fices, in coordination with other members of the United  
16 States Interagency Committee of the National Tsunami  
17 Hazard Mitigation Program, shall provide technical assist-  
18 ance and training to the Intergovernmental Oceanographic  
19 Commission, the World Meteorological Organization, and  
20 other international entities, as part of international efforts  
21 to develop a fully functional global tsunami forecast and  
22 warning system comprising regional tsunami warning net-  
23 works, modeled on the International Tsunami Warning  
24 System of the Pacific.

1 (b) INTERNATIONAL TSUNAMI INFORMATION CEN-  
2 TER.—The Administrator, through the National Weather  
3 Service and in consultation with other relevant Adminis-  
4 tration offices, in cooperation with the Intergovernmental  
5 Oceanographic Commission, shall operate an International  
6 Tsunami Information Center to improve tsunami pre-  
7 paredness for all Pacific Ocean nations participating in  
8 the International Tsunami Warning System of the Pacific,  
9 and may also provide such assistance to other nations par-  
10 ticipating in a global tsunami warning system established  
11 through the Intergovernmental Oceanographic Commis-  
12 sion. As part of its responsibilities around the world, the  
13 Center shall—

14 (1) monitor international tsunami warning ac-  
15 tivities around the world;

16 (2) assist member states in establishing na-  
17 tional warning systems, and make information avail-  
18 able on current technologies for tsunami warning  
19 systems;

20 (3) maintain a library of materials to promul-  
21 gate knowledge about tsunami in general and for use  
22 by the scientific community; and

23 (4) disseminate information, including edu-  
24 cational materials and research reports.

1 (c) DETECTION EQUIPMENT; TECHNICAL ADVICE  
2 AND TRAINING.—In carrying out this section, the Na-  
3 tional Weather Service—

4 (1) shall give priority to assisting nations in  
5 identifying vulnerable coastal areas, creating inunda-  
6 tion maps, obtaining or designing real-time detection  
7 and reporting equipment, and establishing commu-  
8 nication and warning networks and contact points in  
9 each vulnerable nation;

10 (2) may establish a process for transfer of de-  
11 tection and communication technology to affected  
12 nations for the purposes of establishing the inter-  
13 national tsunami warning system; and

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

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

22 **SEC. 8. AUTHORIZATION OF APPROPRIATIONS.**

23 There are authorized to be appropriated to the Ad-  
24 ministrator to carry out this Act—

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

3           (A) not less than 27 percent of the amount  
4       appropriated shall be for the tsunami hazard  
5       mitigation program under section 5; and

6           (B) not less than 8 percent of the amount  
7       appropriated shall be for the tsunami research  
8       program under section 6;

9           (2) \$26,000,000 for fiscal year 2009, of  
10       which—

11          (A) not less than 27 percent of the amount  
12       appropriated shall be for the tsunami hazard  
13       mitigation program under section 5; and

14          (B) not less than 8 percent of the amount  
15       appropriated shall be for the tsunami research  
16       program under section 6;

17          (3) \$27,000,000 for fiscal year 2010, of  
18       which—

19          (A) not less than 27 percent of the amount  
20       appropriated shall be for the tsunami hazard  
21       mitigation program under section 5; and

22          (B) not less than 8 percent of the amount  
23       appropriated shall be for the tsunami research  
24       program under section 6;

1           (4) \$28,000,000 for fiscal year 2011, of  
2       which—

3           (A) not less than 27 percent of the amount  
4       appropriated shall be for the tsunami hazard  
5       mitigation program under section 5; and

6           (B) not less than 8 percent of the amount  
7       appropriated shall be for the tsunami research  
8       program under section 6; and

9           (5) \$29,000,000 for fiscal year 2012, of  
10       which—

11          (A) not less than 27 percent of the amount  
12       appropriated shall be for the tsunami hazard  
13       mitigation program under section 5; and

14          (B) not less than 8 percent of the amount  
15       appropriated shall be for the tsunami research  
16       program under section 6.

Passed the House of Representatives December 6,  
2006.

Attest:

KAREN L. HAAS,

*Clerk.*