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[Report No. 109–59]

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

IN THE SENATE OF THE UNITED STATES

JANUARY 24, 2005

Mr. INOUYE (for himself, Mr. STEVENS, Ms. CANTWELL, Mr. BURNS, Mr. LAUTENBERG, Ms. SNOWE, Mr. AKAKA, Ms. MURKOWSKI, Mrs. CLINTON, Mr. SMITH, Mrs. MURRAY, Mr. LIEBERMAN, Ms. LANDRIEU, Mr. NELSON of Florida, Mr. KERRY, Mr. CHAMBLISS, Mr. WYDEN, Mr. DAYTON, Mrs. BOXER, Mrs. FEINSTEIN, Ms. MIKULSKI, Mr. SARBANES, Mr. CORZINE, Mr. LOTT, Mr. GREGG, and Mr. NELSON of Nebraska) introduced the following bill; which was read twice and referred to the Committee on Commerce, Science, and Transportation

APRIL 19, 2005

Reported by Mr. STEVENS, with an amendment

[Strike all after the enacting clause and insert the part printed in italic]

A BILL

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

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE.

This Act may be cited as the ''Tsunami Preparedness Act''.

SEC. 2. FINDINGS AND PURPOSES.

(a) FINDINGS.—The Congress finds the following:

(1) Tsunami are a series of large waves of long wavelength created by the displacement of water by violent undersea disturbances such as earthquakes, volcanic eruptions, landslides, explosions, and the impact of cosmic bodies.

(2) Tsunami have caused, and can cause in the future, enormous loss of human life, injury, destruction of property, and economic and social disruption in coastal and island communities.

(3) While 85 percent of tsunami occur in the Pacific Ocean, and coastal and island communities in this region are the most vulnerable to the destructive results, tsunami can occur at any point in any ocean or related body of water where there are earthquakes, volcanoes, or any other activity that displaces a large volume of water.

(4) A number of States and territories are subject to the threat of tsunamis, including Alaska,

~~California, Hawaii, Oregon, Washington, American Samoa, the Commonwealth of the Northern Mariana Islands, Guam, Puerto Rico, and the U.S. Virgin Islands.~~

~~(5) The National Oceanic and Atmospheric Administration is responsible for maintaining a tsunami detection and warning system for the Nation, issuing warnings to United States communities at risk from tsunami, and preparing those communities to respond appropriately, through—~~

~~(A) the Pacific Tsunami Warning Center in Ewa Beach, Hawaii, which serves as a warning center for Hawaii, all other United States assets in the Pacific, and Puerto Rico;~~

~~(B) the Alaska/West Coast Tsunami Warning Center in Palmer, Alaska, which is responsible for issuing warnings for Alaska, British Columbia, California, Oregon, and Washington;~~

~~(C) the Federal-State national tsunami hazard mitigation program;~~

~~(D) a tsunami research and assessment program, including programs conducted by the Pacific Marine Environmental Laboratory;~~

~~(E) the TsunamiReady Program, which educates and prepares communities for survival before and during a tsunami; and~~

~~(F) other related programs.~~

~~(6) The National Oceanic and Atmospheric Administration also represents the United States as a member of the International Coordination Group for the Tsunami Warning System in the Pacific, administered by the Intergovernmental Oceanographic Commission of UNESCO, for which the Pacific Tsunami Warning Center acts as the operational center and shares seismic and water level information with 26 member states, and maintains UNESCO's International Tsunami Information Center, in Honolulu, Hawaii, which provides technical and educational assistance to member states.~~

~~(7) The Tsunami Warning Centers receive seismographic information from the Global Seismic Network, an international system of earthquake monitoring stations, from the United States Geological Survey National Earthquake Information Center, and from cooperative regional seismic networks, and use these data to issue tsunami warnings and integrate the information with data from their own tidal and deep ocean monitoring stations, to cancel or~~

verify the existence of a damaging tsunami. Warnings are disseminated by the National Oceanic and Atmospheric Administration to State emergency operation centers.

(8) Current gaps in the International Tsunami Warning System, such as the lack of regional warning systems in the Indian Ocean, the southwest Pacific Ocean, Central and South America, the Mediterranean Sea, and Caribbean, pose risks for coastal and island communities.

(9) The tragic and extreme loss of life experienced by countries in the Indian Ocean following the magnitude 9.0 earthquake and resulting tsunami in that region on December 26, 2004, illustrates the destructive consequences which can occur in the absence of an effective tsunami warning and notification system.

(10) An effective tsunami warning and notification system is part of a multi-hazard disaster warning and preparedness program and requires near real-time seismic, sea level, and oceanographic data, high-speed data analysis capabilities, a high-speed tsunami warning communication system, a sustained program of education and risk assessment, and an established local communications infrastructure for

timely and effective dissemination of warnings to activate evacuation of tsunami hazard zones.

(11) The Tsunami Warning System for the Pacific is a model for other regions of the world to adopt, and can be expanded and modernized to increase detection, forecast, and warning capabilities for vulnerable states and territories, reduce the incidence of costly false alarms, improve reliability of measurement and assessment technology, and increase community preparedness.

(12) Tsunami warning and preparedness capability can be developed in other vulnerable areas of the world, such as the Indian Ocean, by identifying tsunami hazard zones, educating populations, developing alert and notification communications infrastructure, and by deploying near real-time tsunami detection sensors and gauges, establishing hazard communication and warning networks, expanding global monitoring of seismic activity, encouraging the increased exchange of seismic and tidal data between nations, and improving international coordination when a tsunami is detected.

(13) UNESCO has recognized the need to establish tsunami warning systems for regions beyond the Pacific Basin that are vulnerable to tsunams, in-

cluding the Indian Ocean, and has convened a working group to lead an effort to expand the International Tsunami Warning System in the Pacific to such vulnerable regions.

(14) The international community and all vulnerable nations should take coordinated efforts to establish and participate in regional tsunami warning systems and other hazard warnings systems developed to meet the goals of the United Nations International Strategy for Disaster Reduction.

(b) PURPOSES.—The purposes of this Act are—

(1) to improve tsunami detection, forecast, warnings, notification, preparedness, and mitigation in order to protect life and property both in the United States and elsewhere in the world;

(2) to improve and modernize the existing Pacific Tsunami Warning System to increase coverage, reduce false alarms and increase accuracy of forecasts and warnings, and expand detection and warning systems to include other vulnerable States and United States territories, including the Caribbean/Atlantic/Gulf region;

(3) to increase and accelerate mapping, modeling, research, assessment, education, and outreach efforts in order to improve forecasting, prepared-

ness, mitigation, response, and recovery of tsunami and related coastal hazards;

(4) to provide technical and other assistance to speed international efforts to establish regional tsunami warning systems in vulnerable areas worldwide, including the Indian Ocean; and

(5) to improve Federal, State, and international coordination for tsunami and other coastal hazard warnings and preparedness.

SEC. 3. TSUNAMI DETECTION AND WARNING SYSTEM.

(a) IN GENERAL.—The Administrator of the National Oceanic and Atmospheric Administration shall operate regional tsunami detection and warning systems for the Pacific Ocean region and for the Atlantic Ocean, Caribbean, and Gulf of Mexico region that will provide maximum detection capability for United States coastal tsunami.

(b) SYSTEM REQUIREMENTS.—

(1) PACIFIC SYSTEM.—The Pacific tsunami warning system shall cover the entire Pacific Ocean area, including the Western Pacific, the Central Pacific, the North Pacific, the South Pacific, and the East Pacific and Arctic areas.

(2) ATLANTIC, CARIBBEAN, AND GULF OF MEXICO SYSTEM.—The Atlantic, Caribbean, and Gulf

system shall cover areas of the Atlantic Ocean, Caribbean Sea, and the Gulf of Mexico that the Administrator determines—

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

(B) to pose measurable risks of tsunamis for States along the coastal areas of the Atlantic Ocean or the Gulf of Mexico.

(3) COMPONENTS.—The systems shall—

(A) utilize an array of deep ocean detection buoys, including redundant and spare buoys;

(B) include an associated tide gauge and water level system designed for long-term continuous operation tsunami transmission capability;

(C) provide for establishment of a cooperative effort between the National Oceanic and Atmospheric Administration and the United States Geological Survey under which the Geological Survey provides rapid and reliable seismic information to the Administration from international and domestic seismic networks;

(D) provide for information and data processing through the tsunami warning centers established under subsection (c);

(E) be integrated into United States and global ocean and earth observing systems; and

(F) provide a communications infrastructure for at-risk tsunami communities that supports rapid and reliable alert and notification to the public such as the National Oceanic and Atmospheric Administration weather radio and the All Hazard Alert Broadcasting Radio.

(c) TSUNAMI WARNING CENTERS.—

(1) IN GENERAL.—The Administrator shall establish tsunami warning centers to provide a link between the detection and warning system and the tsunami hazard mitigation program established under section 4 including—

(A) a Pacific Tsunami Warning Center in Hawaii;

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

(C) any additional warning centers determined by the Administrator to be necessary.

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

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

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

(C) evaluating deep ocean buoy data and tidal monitoring stations for indications of tsunami resulting from sources other than earthquakes; and

(D) disseminating information and warning bulletins appropriate for local and distant tsunamis to government agencies and the public and alerting potentially impacted coastal areas for evacuation.

(d) TRANSFER OF TECHNOLOGY; MAINTENANCE AND UPGRADES.—In carrying out this section, the Administrator shall—

(1) promulgate specifications and standards for forecast, detection, and warning systems, including detection equipment;

(2) develop and execute a plan for the transfer of technology from ongoing research to long-term operations;

(3) ensure that detection equipment is maintained in operational condition to fulfill the forecasting, detection and warning requirements of the regional tsunami detection and warning systems;

(4) obtain, to the greatest extent practicable, priority treatment in budgeting for, acquiring, transporting, and maintaining weather sensors, tide gauges, water level gauges, and tsunami buoys incorporated into the system including obtaining ship time; and

(5) ensure integration of the tsunami detection system with other United States and global ocean and coastal observation systems, the global earth observing system of systems, global seismic networks, and the Advanced National Seismic System.

(c) CERTIFICATION.—Amounts appropriated for any fiscal year pursuant to section 8 to carry out this section may not be obligated or expended for the acquisition of services for construction or deployment of tsunami detection equipment unless the Administrator certifies in writing to the Senate Committee on Commerce, Science, and Transportation and the House of Representatives Committee on Science within 60 calendar days after the date on which the President submits the Budget of the United States for that fiscal year to the Congress that—

(1) each contractor for such services has met the requirements of the contract for such construction or deployment;

(2) the equipment to be constructed or deployed is capable of becoming fully operational without the obligation or expenditure of additional appropriated funds; and

(3) the Administrator does not reasonably foresee unanticipated delays in the deployment and operational schedule specified in the contract.

SEC. 4. TSUNAMI HAZARD MITIGATION PROGRAM.

(a) IN GENERAL.—The Administrator of the National Oceanic and Atmospheric Administration is authorized to conduct a community-based tsunami hazard mitigation program to improve tsunami preparedness of at-risk areas.

(b) COORDINATING COMMITTEE.—In conducting the program, the Administrator shall establish a coordinating committee comprising representatives of—

(1) the National Oceanic and Atmospheric Administration;

(2) the United States Geological Survey;

(3) the Federal Emergency Management Agency;

(4) the National Science Foundation; and

(5) affected coastal States and territories.

(c) PROGRAM COMPONENTS.—The program shall—

(1) improve the quality and extent of inundation mapping, including assessment of vulnerable inner coastal areas;

(2) promote and improve community outreach and education networks and programs to ensure community readiness, including the development of multi-hazard risk and vulnerability assessment training and decision support tools, implementation of technical training and public education programs, and provide for certification of prepared communities;

(3) integrate tsunami preparedness and mitigation programs into ongoing hazard warning and risk management programs in affected areas including the National Response Plan;

(4) promote the adoption of tsunami warning and mitigation measures by Federal, State, tribal, and local governments and non-governmental entities through a grant program for training, development of guidelines, and other purposes;

(5) through the Federal Emergency Management Agency as the lead agency, develop tsunami specific rescue and recovery guidelines for the National Response Plan, including long-term mitigation measures, educational programs to discourage devel-

opment in high-risk areas, and use of remote sensing and other technology in rescue and recovery operations;

(6) require budget coordination, through the Administration, to carry out the purposes of this Act and to ensure that participating agencies provide necessary funds for matters within their respective areas of authority and expertise; and

(7) provide for periodic external review of the program and for inclusion of the results of such reviews in the report required by section 6(c).

SEC. 5. TSUNAMI RESEARCH PROGRAM.

(a) ESTABLISHMENT.—The Administrator of the National Oceanic and Atmospheric Administration shall, in coordination with other agencies and academic institutions, establish a tsunami research program to develop detection, prediction, communication, and mitigation science and technology that supports tsunami forecasts and warnings, including advanced sensing techniques, information and communication technology, data collection, analysis and assessment for tsunami tracking and numerical forecast modeling that will—

(1) help determine—

(A) whether an earthquake or other seismic event will result in a tsunami; and

(B) the likely path, severity, duration, and travel time of a tsunami;

(2) develop techniques and technologies that may be used to communicate tsunami forecasts and warnings as quickly and effectively as possible to affected communities;

(3) develop techniques and technologies to support evacuation products, including real-time notice of the condition of critical infrastructure along tsunami evacuation routes for public officials and first responders; and

(4) develop techniques for utilizing remote sensing technologies in rescue and recovery operations.

(b) COMMUNICATIONS TECHNOLOGY.—The Administrator, in consultation with the Assistant Secretary of Commerce for Communications and Information and the Federal Communications Commission, shall investigate the potential for improved communications systems for tsunami and other hazard warnings by incorporating into the existing network a full range of options for providing those warnings to the public, including, as appropriate—

(1) telephones, including special alert rings;

(2) wireless and satellite technology, including cellular telephones and pagers;

(3) the Internet, including e-mail;

(4) automatic alert televisions and radios;

(5) innovative and low-cost combinations of such technologies that may provide access to remote areas; and

(6) other technologies that may be developed.

SEC. 6. TSUNAMI SYSTEM UPGRADE AND MODERNIZATION.

(a) SYSTEM UPGRADES.—The Administrator of the National Oceanic and Atmospheric Administration shall—

(1) authorize and direct the immediate repair of existing deep ocean detection buoys and related components of the system;

(2) ensure the deployment of an array of deep ocean detection buoys in the regions described in section 3(a) of this Act;

(3) ensure expansion or upgrade of the tide gauge network in the regions described in section 3(a); and

(4) complete the upgrades not later than December 31, 2007.

(b) CONGRESSIONAL NOTIFICATIONS.—The Administrator shall notify the Senate Committee on Commerce, Science, and Transportation and the House of Representatives Committee on Science of—

(1) impaired regional detection coverage due to equipment or system failures; and

(2) significant contractor failures or delays in completing work associated with the tsunami detection and warning system.

(c) ANNUAL REPORT.—The Administrator shall transmit an annual report to the Senate Committee on Commerce, Science, and Transportation and the House of Representatives Committee on Science on the status of the tsunami detection and warning system, including accuracy, false alarms, equipment failures, improvements over the previous year, and goals for further improvement (or plans for curing failures) of the system, as well as progress and accomplishments of the national tsunami hazard mitigation program.

(d) EXTERNAL REVIEW.—The National Academy of Science shall review the tsunami detection, forecast, and warning system operated by the National Oceanic and Atmospheric Administration under this Act to assess further modernization and coverage needs, as well as long-term operational reliability issues, taking into account measures implemented under this Act, and transmit a report containing its recommendations, including an estimate of the costs of implementing those recommendations, to the Senate Committee on Commerce, Science, and Transportation and the House of Representatives Committee on Science within 24 months after the date of enactment of this Act.

SEC. 7. GLOBAL TSUNAMI WARNING AND MITIGATION NETWORK.

(a) INTERNATIONAL TSUNAMI WARNING SYSTEM.—The Administrator of the National Oceanic and Atmospheric Administration, in coordination with other members of the United States Interagency Committee of the National Tsunami Mitigation Program, shall provide technical assistance and advice to the Intergovernmental Oceanographic Commission of UNESCO, the World Meteorological Organization, and other international entities, as part of international efforts to develop a fully functional global tsunami warning system comprised of regional tsunami warning networks, modeled on the International Tsunami Warning System of the Pacific.

(b) DETECTION EQUIPMENT; TECHNICAL ADVICE.—In carrying out this section, the Administrator—

(1) shall give priority to assisting nations in identifying vulnerable coastal areas, creating inundation maps, obtaining or designing real-time detection and reporting equipment, and establishing communication and warning networks and contact points in each vulnerable nation; and

(2) may establish a process for transfer of detection and communication technology to affected nations for the purposes of establishing the international tsunami warning system.

(c) DATA-SHARING REQUIREMENT.—The Administrator may not provide assistance under this section for any region unless all affected nations in that region participating in the tsunami warning network agree to share relevant data associated with the development and operation of the network.

(d) RECEIPT OF INTERNATIONAL REIMBURSEMENT AUTHORIZED.—The Administrator may accept payment to, or reimbursement of, the National Oceanic and Atmospheric Administration in cash or in kind from international organizations and foreign authorities, or payment or reimbursement made on behalf of such an authority, for expenses incurred by the Administrator in carrying out any activity under this Act. Any such payments or reimbursements shall be considered a reimbursement to the appropriated funds of the Administration.

SEC. 8. AUTHORIZATION OF APPROPRIATIONS.

There are authorized to be appropriated to the Administrator of the National Oceanic and Atmospheric Administration $35,000,000 for each of fiscal years 2006 through 2012 to carry out this Act.

SECTION 1. SHORT TITLE.

This Act may be cited as the "Tsunami Preparedness Act".

SEC. 2. FINDINGS AND PURPOSES.

(a) FINDINGS.—The Congress finds the following:

(1) Tsunami are a series of large waves of long wavelength created by the displacement of water by violent undersea disturbances such as earthquakes, volcanic eruptions, landslides, explosions, and the impact of cosmic bodies.

(2) Tsunami have caused, and can cause in the future, enormous loss of human life, injury, destruction of property, and economic and social disruption in coastal and island communities.

(3) While 85 percent of tsunami occur in the Pacific Ocean, and coastal and island communities in this region are the most vulnerable to the destructive results, tsunami can occur at any point in any ocean or related body of water where there are earthquakes, volcanoes, or any other activity that displaces a large volume of water.

(4) A number of States and territories are subject to the threat of tsunamis, including Alaska, California, Hawaii, Oregon, Washington, American Samoa, the Commonwealth of the Northern Mariana Islands, Guam, Puerto Rico, and the U.S. Virgin Islands.

(5) The National Oceanic and Atmospheric Administration is responsible for maintaining a tsu-

nami detection and warning system for the Nation, issuing warnings to United States communities at risk from tsunami, and preparing those communities to respond appropriately, through—

(A) the Pacific Tsunami Warning Center in Ewa Beach, Hawaii, which serves as a warning center for Hawaii, all other United States assets in the Pacific, and Puerto Rico;

(B) the Alaska/West Coast Tsunami Warning Center in Palmer, Alaska, which is responsible for issuing warnings for Alaska, British Columbia, California, Oregon, and Washington;

(C) the Federal-State national tsunami hazard mitigation program;

(D) a tsunami research and assessment program, including programs conducted by the Pacific Marine Environmental Laboratory;

(E) the TsunamiReady Program, which educates and prepares communities for survival before and during a tsunami;

(F) an archive of historical tsunami data, held at the National Oceanic and Atmospheric Administration's National Geophysical Data Center; and

(G) other related programs, including those operated in coordination with academic institutions.

(6) The National Oceanic and Atmospheric Administration also represents the United States as a member of the International Coordination Group for the Tsunami Warning System in the Pacific, administered by the Intergovernmental Oceanographic Commission of UNESCO, for which the Pacific Tsunami Warning Center acts as the operational center and shares seismic and water level information with 26 member states, and maintains UNESCO's International Tsunami Information Center, in Honolulu, Hawaii, which provides technical and educational assistance to member states.

(7) The Tsunami Warning Centers receive seismographic information from the Global Seismic Network, an international system of earthquake monitoring stations, from the United States Geological Survey National Earthquake Information Center, the Alaska Earthquake Information Center, and cooperative regional seismic networks, and use these data to issue tsunami warnings and integrate the information with data from their own tidal and deep ocean monitoring stations, to cancel or verify the existence

of a damaging tsunami. Warnings are disseminated by the National Oceanic and Atmospheric Administration to State emergency operation centers.

(8) Current gaps in the International Tsunami Warning System, such as the lack of regional warning systems in the Indian Ocean, the southwest Pacific Ocean, Central and South America, the Mediterranean Sea, and Caribbean, pose risks for coastal and island communities.

(9) The tragic and extreme loss of life experienced by countries in the Indian Ocean following the magnitude 9.0 earthquake and resulting tsunami in that region on December 26, 2004, illustrates the destructive consequences which can occur in the absence of an effective tsunami warning and notification system.

(10) An effective tsunami warning and notification system is part of a multi-hazard disaster warning and preparedness program and requires real-time seismic, sea level, and oceanographic data, high-speed data analysis capabilities, a high-speed tsunami warning communication system, a sustained program of education and risk assessment to develop response strategies, and an established local communications infrastructure for timely and effective dissemination

of warnings to activate evacuation of tsunami hazard zones.

(11) The Tsunami Warning System for the Pacific is a model for other regions of the world to adopt, and can be expanded and modernized to increase detection, forecast, and warning capabilities for vulnerable states and territories, reduce the incidence of costly false alarms, improve reliability of measurement and assessment technology, and increase community preparedness.

(12) Tsunami warning and preparedness capability can be developed in other vulnerable areas of the world, such as the Indian Ocean, by identifying tsunami hazard zones, educating populations, developing alert and notification communications infrastructure, and by deploying near real-time tsunami detection sensors and gauges, establishing hazard communication and warning networks, expanding global monitoring of seismic activity, encouraging the increased exchange of seismic and tidal data between nations, and improving international coordination when a tsunami is detected.

(13) UNESCO has recognized the need to establish tsunami warning systems for regions beyond the

Pacific Basin that are vulnerable to tsunami, including the Indian Ocean, and has convened a working group to lead an effort to expand the International Tsunami Warning System in the Pacific to such vulnerable regions.

(14) The international community and all vulnerable nations should take coordinated efforts to establish and participate in regional tsunami warning systems and other hazard warnings systems developed to meet the goals of the United Nations International Strategy for Disaster Reduction.

(15) On February 16, 2005, the United States, together with 53 other Nations participating in the Third Earth Observation Summit in Brussels, Belgium, adopted a 10-year implementation plan as the basis for establishing the Global Earth Observation System of Systems.

(16) The Global Earth Observation System of Systems will consist of existing and future earth observation systems, including the United States tsunami detection and warning system.

(b) PURPOSES.—The purposes of this Act are—

(1) to improve tsunami detection, forecast, warnings, notification, preparedness, and mitigation in

order to protect life and property both in the United States and elsewhere in the world;

(2) to improve and modernize the existing Pacific Tsunami Warning System to increase coverage, reduce false alarms and increase accuracy of forecasts and warnings, and expand detection and warning systems to include other vulnerable States and United States territories, including the Caribbean/Atlantic/Gulf region;

(3) to increase and accelerate mapping, modeling, research, assessment, education, and outreach efforts in order to improve forecasting, preparedness, mitigation, response, and recovery of tsunami and related coastal hazards;

(4) to provide technical and other assistance to speed international efforts to establish regional tsunami warning systems in vulnerable areas worldwide, including the Indian Ocean; and

(5) to improve Federal, State, and international coordination for tsunami and other coastal hazard warnings and preparedness.

SEC. 3. TSUNAMI DETECTION AND WARNING SYSTEM.

(a) IN GENERAL.—The Administrator of the National Oceanic and Atmospheric Administration shall operate regional tsunami detection and warning systems for the Pa-

cific Ocean region and for the Atlantic Ocean, Caribbean, and Gulf of Mexico region that will provide maximum detection capability for United States coastal tsunami.

(b) SYSTEM REQUIREMENTS.—

(1) PACIFIC SYSTEM.—The Pacific tsunami warning system shall cover the entire Pacific Ocean area, including the Western Pacific, the Central Pacific, the North Pacific, the South Pacific, and the East Pacific and Arctic areas.

(2) ATLANTIC, CARIBBEAN, AND GULF OF MEXICO SYSTEM.—The Atlantic, Caribbean, and Gulf system shall cover areas of the Atlantic Ocean, Caribbean Sea, and the Gulf of Mexico that the Administrator determines—

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

(B) to pose measurable risks of tsunamis for States along the coastal areas of the Atlantic Ocean or the Gulf of Mexico.

(3) COMPONENTS.—The systems shall—

(A) utilize an array of deep ocean detection buoys, including redundant and spare buoys;

(B) include an associated tide gauge and water level system designed for long-term continuous operation tsunami transmission capability;

(C) allow for such additional sensors as may be necessary to provide other ocean and earth observation capabilities;

(D) provide for the establishment of a cooperative effort between the National Oceanic and Atmospheric Administration and the United States Geological Survey under which the Geological Survey and State earthquake information centers provide rapid and reliable real-time seismic information to the Administration from international and domestic seismic networks;

(E) provide for information and data processing through the tsunami warning centers established under subsection (c);

(F) be integrated into United States and global ocean and earth observing systems, including the Global Earth Observation System of Systems;

(G) provide a communications infrastructure, in coordination with local communications providers, for at-risk tsunami communities that supports rapid and reliable alert and notification to the public, such as the National Oceanic and Atmospheric Administration's Weather, Alert, and Readiness Network, which includes the

weather radio and the All Hazard Alert Broadcasting Radio; and

(H) the integration of NOAA's Advanced Weather Interactive Processing System with other communications technologies.

(4) FEDERAL COOPERATION.—In deploying and maintaining detection buoys utilized in the tsunami warning system, the Administrator should leverage the assistance and assets of the United States Coast Guard, the Navy, and other Federal agency assets in the region. Within 180 days after the date of enactment of this Act, the Administrator shall provide a report to the Senate committee on Commerce, Science, and Transportation, the House of Representatives Committee on Science, and the House of Representatives Committee on Resources that summarizes the extent to which the United States Coast Guard or any other Federal agency is assistance in deploying and maintaining such buoys.

(c) TSUNAMI WARNING CENTERS.—

(1) IN GENERAL.—The Administrator shall establish tsunami warning centers to provide a link between the detection and warning system and the tsunami hazard mitigation program established under section 4 including—

(A) a Pacific Tsunami Warning Center in Hawaii;

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

(C) any additional warning centers determined by the Administrator to be necessary.

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

(A) continuously monitoring data from seismological stations, deep ocean detection buoys, and tidal monitoring stations and providing such data to the national tsunami archive;

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

(C) evaluating deep ocean buoy data and tidal monitoring stations for indications of tsunami resulting from sources other than earthquakes; and

(D) disseminating information and warning bulletins appropriate for local and distant tsunamis to government agencies and the public and alerting potentially impacted coastal areas for evacuation.

(d) DATA MANAGEMENT.—The Administrator shall maintain national and regionally-based data management

systems to support and establish data management requirements for the tsunami detection and monitoring system, including requirements for—

(1) quality control and quality assurance;

(2) archiving and maintaining data;

(3) supporting integration of observations from the system with other national and international water level measurements, such as the Global Sea Level Monitoring System;

(4) integration of observations from the system with other elements of the global and coastal components of the integrated ocean and coastal observing system and the Global Earth Observation System of Systems; and

(5) the development of and access to data sets and integrated data products designed to support multi-hazard regional vulnerability assessment and adaptation programs such as the program established under section 8.

SEC. 4. TSUNAMI HAZARD MITIGATION PROGRAM.

(a) IN GENERAL.—The Administrator of the National Oceanic and Atmospheric Administration shall, in coordination with other agencies and academic institutions, develop and conduct a community-based tsunami hazard

mitigation program to improve tsunami preparedness of at-risk areas.

(b) COORDINATING COMMITTEE.—In developing and conducting the program, the Administrator shall establish a coordinating committee comprising representatives of—

(1) the National Oceanic and Atmospheric Administration;

(2) the United States Geological Survey;

(3) the Federal Emergency Management Agency;

(4) the National Science Foundation;

(5) the National Institute of Standards and Technology; and

(6) affected coastal States and territories.

(c) PROGRAM COMPONENTS.—The program shall—

(1) improve the quality and extent of inundation mapping, including assessment of vulnerable inner coastal areas;

(2) promote and improve community outreach and education networks and programs to ensure community awareness and readiness, including the development of multi-hazard risk and vulnerability assessment training and decision support tools, implementation of technical training and public education programs, and provide for certification of prepared communities;

(3) integrate tsunami awareness, preparedness, and mitigation programs into ongoing hazard warning and risk management programs in affected areas including the National Response Plan and State coastal zone management plans;

(4) promote the adoption of tsunami warning and mitigation measures by Federal, State, tribal, and local governments and non-governmental entities through a grant program for training, development of guidelines, and other purposes;

(5) through the Federal Emergency Management Agency as the lead agency, develop tsunami specific rescue and recovery guidelines for the National Response Plan, including long-term mitigation measures, educational programs to discourage development in high-risk areas, and use of remote sensing and other technology in rescue and recovery operations;

(6) require budget coordination, through the Administration, to carry out the purposes of this Act and to ensure that participating agencies provide necessary funds for matters within their respective areas of authority and expertise; and

(7) provide for periodic external review of the program and for inclusion of the results of such reviews in the report required by section 6(e).

SEC. 5. TSUNAMI RESEARCH PROGRAM.

(a) ESTABLISHMENT.—The Administrator of the National Oceanic and Atmospheric Administration shall, in coordination with other agencies and academic institutions, establish a tsunami research program to develop detection, prediction, communication, and mitigation science and technology that supports tsunami forecasts and warnings, including advanced sensing techniques, information and communication technology, data collection, analysis and assessment for tsunami tracking and numerical forecast modeling that will—

(1) help determine—

(A) whether an earthquake or other seismic event will result in a tsunami; and

(B) the likely path, severity, duration, and travel time of a tsunami;

(2) develop techniques and technologies that may be used to communicate tsunami forecasts and warnings as quickly and effectively as possible to affected communities;

(3) develop techniques and technologies to support evacuation products, including real-time notice of the condition of critical infrastructure along tsunami evacuation routes for public officials and first responders; and

(4) develop techniques for utilizing remote sensing technologies in rescue and recovery operations.

(b) COMMUNICATIONS TECHNOLOGY.—The Administrator, in consultation with in consultation with the Assistant Secretary of Commerce for Communications and Information and the Federal Communications Commission, shall investigate the potential for improved communications systems for tsunami and other hazard warnings by incorporating into the existing network a full range of options for providing those warnings to the public, including, as appropriate—

(1) telephones, including special alert rings;

(2) wireless and satellite technology, including cellular telephones and pagers;

(3) the Internet, including e-mail;

(4) automatic alert televisions and radios;

(5) innovative and low-cost combinations of such technologies that may provide access to remote areas; and

(6) other technologies that may be developed.

SEC. 6. TSUNAMI SYSTEM UPGRADE AND MODERNIZATION.

(a) SYSTEM UPGRADES.—The Administrator of the National Oceanic and Atmospheric Administration shall—

(1) authorize and direct the immediate repair of existing deep ocean detection buoys and related components of the system;

(2) ensure the deployment of an array of deep ocean detection buoys capable of carrying multi-observation technology in the regions described in section 3(a) of this Act;

(3) ensure expansion or upgrade of the seismic monitoring and tide gauge networks in the regions described in section 3(a); and

(4) complete the upgrades not later than December 31, 2007.

(b) TRANSFER OF TECHNOLOGY; MAINTENANCE AND UPGRADES.—In carrying out this section, the Administrator shall—

(1) promulgate specifications and standards for forecast, detection, and warning systems, including detection equipment;

(2) develop and execute a plan for the transfer of technology from ongoing research to long-term operations;

(3) ensure that detection equipment is maintained in operational condition to fulfill the forecasting, detection and warning requirements of the regional tsunami detection and warning systems;

(4) obtain, to the greatest extent practicable, priority treatment in budgeting for, acquiring, transporting, and maintaining weather sensors, tide gauges, water level gauges, and tsunami buoys incorporated into the system including obtaining ship time; and

(5) ensure integration of the tsunami detection system with other United States and global ocean and coastal observation systems, the Global Earth Observation System of Systems, global seismic networks, and the Advanced National Seismic System.

(c) CERTIFICATION.—Amounts appropriated for any fiscal year pursuant to section 9 to carry out this section may not be obligated or expended for the acquisition of services for construction or deployment of tsunami detection equipment unless the Administrator certifies in writing to the Senate Committee on Commerce, Science, and Transportation, the House of Representatives Committee on Science, and the House of Representatives Committee on Resources within 60 calendar days after the date on which the President submits the Budget of the United States for that fiscal year to the Congress that—

(1) each contractor for such services has met the requirements of the contract for such construction or deployment;

(2) the equipment to be constructed or deployed is capable of becoming fully operational without the obligation or expenditure of additional appropriated funds; and

(3) the Administrator does not reasonably foresee unanticipated delays in the deployment and operational schedule specified in the contract.

(d) CONGRESSIONAL NOTIFICATIONS.—The Administrator shall notify the Senate Committee on Commerce, Science, and Transportation, the House of Representatives Committee on Science, and the House of Representatives Committee on Resources of—

(1) impaired regional detection coverage due to equipment or system failures; and

(2) significant contractor failures or delays in completing work associated with the tsunami detection and warning system.

(e) ANNUAL REPORT.—The Administrator shall transmit an annual report to the Senate Committee on Commerce, Science, and Transportation and the House of Representatives Committee on Science the status of the tsunami detection and warning system, including accuracy, false alarms, equipment failures, improvements over the previous year, and goals for further improvement (or plans for curing failures) of the system, as well as progress and accom-

plishments of the national tsunami hazard mitigation program.

(f) EXTERNAL REVIEW.—The National Academy of Science shall review the tsunami detection, forecast, and warning system operated by the National Oceanic and Atmospheric Administration under this Act to assess further modernization and coverage needs, as well as long-term operational reliability issues, taking into account measures implemented under this Act, and transmit a report containing its recommendations, including an estimate of the costs of implementing those recommendations, to the Senate Committee on Commerce, Science, and Transportation and the House of Representatives Committee on Science within 24 months after the date of enactment of this Act.

SEC. 7. GLOBAL TSUNAMI WARNING AND MITIGATION NETWORK.

(a) INTERNATIONAL TSUNAMI WARNING SYSTEM.—The Administrator of the National Oceanic and Atmospheric Administration, in coordination with other members of the United States Interagency Committee of the National Tsunami Mitigation Program, shall provide technical assistance and advice to the Intergovernmental Oceanographic Commission of UNESCO, the World Meteorological Organization, the Group on Earth Observations, and other international entities, as part of international efforts to de-

velop a fully functional global tsunami warning system comprised of regional tsunami warning networks, modeled on the International Tsunami Warning System of the Pacific, and consistent with the 10-year implementation plan for the Global Earth Observation System of Systems.

(b) INTERNATIONAL TSUNAMI INFORMATION CENTER.—The Administrator shall operate an International Tsunami Information Center to improve tsunami preparedness for all Pacific Ocean nations participating in the International Tsunami Warning System of the Pacific, and which may also provide such assistance to other nations participating in a global tsunami warning system established through the International Oceanographic Committee of UNESCO. As part of its responsibilities in the Pacific, the Center shall—

(1) monitor international tsunami warning activities in the Pacific;

(2) assist member states in establishing national warning systems, and make information available on current technologies for tsunami warning systems;

(3) maintain a library of materials to promulgate knowledge about tsunamis in general and for use by the scientific community; and

(4) disseminate information, including educational materials and research reports.

(c) TECHNICAL ASSISTANCE.—In carrying out this section, the Administrator—

(1) shall give priority to assisting nations in identifying vulnerable coastal areas, creating inundation maps, obtaining or designing real-time detection and reporting equipment, and establishing communication and warning networks and contact points in each vulnerable nation;

(2) may establish a process for transfer of detection and communication technology to affected nations for the purposes of establishing the international tsunami warning system; and

(3) shall provide technical and other assistance to support international tsunami education, response, vulnerability, and adaptation programs.

(d) DATA-SHARING REQUIREMENT.—The Administrator may not provide assistance under this section for any region unless all affected nations in that region participating in the tsunami warning network agree to share relevant data associated with the development and operation of the network.

(e) FUNDING ASSISTANCE.—The Administrator, in coordination with the Secretary of State, shall seek funding assistance from participating nations needed to ensure es-

tablishment of a fully functional global tsunami warning system.

(f) RECEIPT OF INTERNATIONAL REIMBURSEMENT AUTHORIZED.—The Administrator may accept payment to, or reimbursement of, the National Oceanic and Atmospheric Administration in cash or in kind from international organizations and foreign authorities, or payment or reimbursement made on behalf of such an authority, for expenses incurred by the Administrator in carrying out any activity under this Act. Any such payments or reimbursements shall be considered a reimbursement to the appropriated funds of the Administration.

SEC. 8. COASTAL COMMUNITY VULNERABILITY AND ADAPTATION PROGRAM.

(a) ESTABLISHMENT.—The Administrator of the National Oceanic and Atmospheric Administration shall establish an integrated coastal vulnerability and adaptation program focused on improving the resilience of coastal communities to natural hazards and disasters. The program shall be regional in nature, build upon and integrate existing Federal and State programs, and provide usable products that will improve preparedness of communities, businesses, and government entities. The program may include the following activities:

(1) Development of multi-hazard vulnerability maps to characterize and assess risks of coastal communities to a range of natural hazards and provide a baseline for assessing future risks.

(2) Multi-disciplinary vulnerability assessment research and education that will help integrate risk management with community development planning and policies.

(3) Risk management and leadership training for the public, local officials, and institutions that will enhance understanding and preparedness.

(4) Risk assessment technology development, including research and development of emerging technologies and practical application of existing or emerging technologies, such as modeling, remote sensing, geospatial technology, engineering, and observing systems.

(5) Risk management data and information services, including access to data and products derived from observing and detection systems, as well as development and maintenance of new integrated data products that would support risk assessment and risk management programs.

(6) Risk communication systems that coordinate with and build upon existing alert, warning, and

forecast systems and actively engage policy officials, government agencies, businesses, communities, non-governmental organizations, and the media in the design and implementation of the system.

(b) REGIONAL PILOT PROJECTS.—

(1) IN GENERAL.—Within 1 year after the date of enactment of this Act, the Administrator shall, in consultation with the appropriate Federal, State, tribal, and local governmental entities, establish 3 pilot projects to conduct regional assessments of the vulnerability of coastal areas of the United States to hazards associated with tsunami and other coastal hazards, including sea level rise, increases in severe weather events, and climate variability and change. Priority shall be given to collaborative partnership proposals from regionally-based multi-organizational coalitions. In preparing the regional assessments, the Administrator shall collect and compile current information on tsunami, climate change, sea level rise, natural hazards, coastal erosion and mapping, and ongoing regional efforts to address them.

(2) SCOPE.—Regional assessments under the pilot program shall include an evaluation of—

(A) the social impacts associated with threats to and potential losses of housing, communities, and infrastructure;

(B) the physical impacts such as coastal erosion, flooding and loss of estuarine habitat, saltwater intrusion of aquifers and saltwater encroachment, and species migration;

(C) the economic impact on local, State, tribal, and regional economies, including the impact on coastal infrastructure and the abundance or distribution of economically important living marine resources; and

(D) opportunities to enhance the resilience of at-risk communities, economic sectors, and natural resources.

(c) SELECTION CRITERIA.—The Administrator shall rely on the following criteria in identifying appropriate regional pilot projects:

(1) Vulnerability to tsunami, hurricanes, extreme weather, flooding, climate, and other coastal hazards.

(2) Dependence on economic sectors and natural resources that are particularly sensitive to coastal hazards.

(3) Opportunities to link and leverage related regional risk observation, research, forecasting, assessment, educational and risk management programs.

(4) Demonstration of strong, interagency collaboration in the area of risk management.

(5) Access to NOAA and other Federal agency programs, facilities, and infrastructure related to tsunami and other coastal hazards monitoring, warning, forecasting, research assessment, and data management.

(d) REGIONAL ADAPTATION PLANS.—The Administrator shall, within 3 years after the commencement of each project under subsection (b), submit to the Congress regional adaptation plans—

(1) based on the information contained in the regional assessments conducted under subsection (b);

(2) developed with the participation of other Federal agencies, State, tribal, and local government agencies, and non-governmental entities (including academia and the private sector) that will be critical in the implementation of the plan at the State, tribal, and local levels;

(3) that recommend targets and strategies to address coastal impacts associated with tsunami, climate change, sea level rise, or climate variability;

(4) that include recommendations for both short- and long-term adaptation strategies; and

(5) that include recommendations on—

(A) Federal flood insurance program modifications;

(B) areas that have been identified as high risk through mapping and assessment;

(C) enhancing the effectiveness of State coastal zone management programs in mitigating or preventing coastal risks;

(D) mitigation incentives such as rolling easements, strategic retreat, State or Federal acquisition in fee simple or other interest in land, construction standards, and zoning;

(E) land and property owner education;

(F) economic planning for small communities dependent upon affected coastal resources, including fisheries; and

(G) funding requirements and mechanisms.

(e) TECHNICAL PLANNING AND FINANCIAL ASSISTANCE.—The Administrator, through the National Ocean Service, shall establish a coordinated program—

(1) to provide technical planning assistance and financial assistance to coastal States, tribes, and local governments as they develop and implement adapta-

tion or mitigation strategies and plans under this section; and

(2) to make products, information, tools, and technical expertise generated from the development of the regional assessment and the regional adaptation plan available to coastal States for the purposes of developing their own State, tribal, and local plans.

SEC. 9. AUTHORIZATION OF APPROPRIATIONS.

There are authorized to be appropriated to the Administrator of the National Oceanic and Atmospheric Administration—

(1) $35,000,000 for each of fiscal years 2006 through 2012 to carry out this Act (other than section 8); and

(2) $5,000,000 for each of such fiscal years to carry out section 8, of which at least $3,000,000 for each fiscal year shall be used to carry out the pilot projects authorized by section 8(b).

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[Report No. 109–59]

A BILL

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

APRIL 19, 2005

Reported with an amendment