AUTHENTICATED
U.S. GOVERNMENT
INFORMATION
GPO

Calendar No. 75

109TH CONGRESS *1st Session*	SENATE	REPORT 109–59

TSUNAMI PREPAREDNESS ACT

R E P O R T

OF THE

COMMITTEE ON COMMERCE, SCIENCE, AND TRANSPORTATION

ON

S. 50

APRIL 19, 2005.—Ordered to be printed

U.S. GOVERNMENT PRINTING OFFICE
39—010 WASHINGTON : 2004

SENATE COMMITTEE ON COMMERCE, SCIENCE, AND TRANSPORTATION

ONE HUNDRED NINTH CONGRESS

FIRST SESSION

TED STEVENS, Alaska, *Chairman*
DANIEL K. INOUYE, Hawaii, *Co-Chairman*

JOHN MCCAIN, Arizona
CONRAD BURNS, Montana
TRENT LOTT, Mississippi
KAY BAILEY HUTCHISON, Texas
OLYMPIA J. SNOWE, Maine
GORDON H. SMITH, Oregon
JOHN ENSIGN, Nevada
GEORGE ALLEN, Virginia
JOHN E. SUNUNU, New Hampshire
JIM DEMINT, South Carolina
DAVID VITTER, Louisiana

JOHN D. ROCKEFELLER IV, West Virginia
JOHN F. KERRY, Massachusetts
BYRON L. DORGAN, North Dakota
BARBARA BOXER, California
BILL NELSON, Florida
MARIA CANTWELL, Washington
FRANK LAUTENBERG, New Jersey
E. BENJAMIN NELSON, Nebraska
MARK PRYOR, Arkansas

LISA SUTHERLAND, *Staff Director*
CHRISTINE DRAGER KURTH, *Deputy Staff Director*
DAVID RUSSELL, *Chief Counsel*
MARGARET CUMMISKY, *Democratic Staff Director and Chief Counsel*
SAMUEL WHITEHORN, *Democratic Deputy Staff Director and General Counsel*

Calendar No. 75

109TH CONGRESS *1st Session* | SENATE | REPORT 109–59

TSUNAMI PREPAREDNESS ACT

APRIL 19, 2005.—Ordered to be printed

Mr. STEVENS, from the Committee on Commerce, Science, and Transportation, submitted the following

REPORT

[To accompany S. 50]

The Committee on Commerce, Science, and Transportation, to which was referred the bill (S. 50) to authorize and strengthen the National Oceanic and Atmospheric Administration's tsunami detection, forecast, warning, and mitigation program, and for other purposes, having considered the same, reports favorably thereon with an amendment (in the nature of a substitute) and recommends that the bill (as amended) do pass.

PURPOSE OF THE BILL

The bill authorizes NOAA to establish, operate, and maintain a dependable national tsunami warning system that would provide maximum tsunami detection capability for the nation. The system would build on the model established in the Pacific, and provide for its repair, expansion and modernization by the close of calendar year 2007. The system would include 4 components, i.e., (1) an expanded and upgraded detection and warning system; (2) a Federal-State tsunami hazard mitigation program; (3) a tsunami research program; and (4) a modernization and upgrade program. In addition, the bill would direct NOAA to provide any necessary technical or other assistance to international efforts to establish regional systems in other parts of the world, including the Indian Ocean. The bill would authorize $35 million for each of fiscal years 2006 through 2012 to carry out these activities.

BACKGROUND AND NEEDS

Tsunami are a fast-moving series of ocean waves generated by the rapid displacement of a water column in the ocean. Such dis-

placement is usually caused by submarine geologic activity such as volcanoes, earthquakes, or landslides. Variables affecting the size and power of tsunami include the size and speed of the seafloor displacement, the depth of the water column above the displacement, the efficiency of the energy transfer from the earth's crust to the water column, and the shape of the shoreline and the seafloor along the coast where the waves reach land.

Tsunami can travel across open oceans at great speeds, sometimes over 600 miles per hour in very deep water. They can be only a few inches high and many miles long. As tsunami enter shallow water, their speed decreases and the wave height increases. This "shoaling effect" creates a larger, relatively slower wave that can cause massive damage in coastal areas and low-lying inland regions. Tsunami often appear as a rapidly moving tide, a series of breaking waves, or a bore wave (a step-like wave with a steep breaking front). Tsunami rarely cause high, breaking waves, which is what many people envision "tidal waves" look like. Behind the bore is a fast-moving flood that is capable of carrying extremely large and heavy pieces of debris. Strong tsunami-induced currents can lead to erosion of foundations around coastal structures. Finally, tsunami often result in significant loss of life.

At 7:58 a.m. on December 26, 2004, a magnitude 9.0 earthquake occurred off the coast of northern Sumatra, the location of a subduction zone in the Indian Ocean, where the India plate is being pushed beneath the Burma plate. The rupture along the plate boundary extended 1000 kilometers and the sea floor rose several meters. This earthquake caused severe shaking near the epicenter, and generated a large tsunami that struck the coasts of Sumatra (within 30 minutes), Thailand (within 1.5 hours), and India and Sri Lanka (within 2 hours). This massive tsunami in the Indian Ocean ultimately took lives in more than 11 countries. The U.S. Geological Survey (USGS) reported that the earthquake was the largest since the 9.2 magnitude Good Friday Earthquake off Alaska in 1964, and tied for fourth largest since 1900.

As of January 26, 2005, the Government of Indonesia's Ministry of Health had 96,232 confirmed deaths and 132,197 persons missing and presumed dead. However, the exact number of victims will likely never be known. Different reporting practices for lost and dead persons by the governments in the affected region and the use of mass graves to prevent the outbreak of disease make an exact figure impossible to calculate. The effects of the tsunami have been felt throughout the region. In Sri Lanka, the Government of Sri Lanka's Center for National Operations increased the official number of displaced from 396,170 to 502,426. The Government of Indonesia indicates that the earthquake and tsunami destroyed approximately 127,000 houses and damaged another 151,000 houses—one-third of all housing in the area. UNICEF estimates between 765 to 1151 schools were damaged or destroyed in Indonesia.

According to the USGS, the subduction zones at the India and Burma tectonic plates are similar to those throughout the Pacific region and have the potential to create "megathrust" events where one tectonic plate is driven beneath another. The Pacific is most vulnerable because it covers nearly one-third of the earth's surface and is surrounded by a series of mountain chains, deep-ocean

trenches, and island arcs called the "ring of fire" where most earthquakes occur (off the coasts of Kamchatka, Japan, the Kuril Islands, Alaska, and South America). USGS reports that the world's largest recorded earthquakes have all been megathrust events, including the magnitude 9.5 1960 Chile earthquake, the magnitude 9.2 1964 Prince William Sound, Alaska, earthquake, the magnitude 9.1 1957 Andreanof Islands, Alaska, earthquake, and the magnitude 9.0 1952 Kamchatka earthquake. Three of these tsunami-generating earthquakes occurred in the Aleutian Islands (1946, 1957, and 1964) and caused significant damage and loss of life in Alaska and Hawaii.

Other areas of the United States can be vulnerable to tsunami. According to USGS, there is a 10 to 14 percent chance of a similar earthquake and tsunami centered in the Cascadia subduction zone off the coasts of Oregon and Northern California within the next 50 years. If an earthquake did occur in this region, coastal communities in Washington, Oregon, and northern California could experience a local tsunami with no more than 10 to 20 minutes of warning time. While tsunami are less frequent in the Atlantic Ocean, there is a fault zone in the Caribbean, and while it is not very seismically active, the possibility for a tsunami does exist. In addition, an undersea formation off the coast of the Canary Islands is being monitored by scientists for stability. If the formation were to collapse, an undersea landslide would result and trigger a tsunami that could possibly travel across the Atlantic and strike the east coast of the United States.

Providing sufficient warning is crucial for minimizing the loss of life due to tsunami. The NOAA is responsible for coordinating tsunami-related activities in the United States and works closely with the USGS and the National Science Foundation (NSF), which provide, respectively, seismographic information and science and research capabilities. NOAA also represents the United States as a member of the International Tsunami Warning System in the Pacific, the only international tsunami warning system, and hosts the operational center of the international system at the National Weather Service offices in Hawaii. The international system was established by the Intergovernmental Oceanographic Commission (IOC) of the United Nations Educational, Scientific, and Cultural Organization (UNESCO) in 1965. While the system can detect earthquakes through measurements taken through a global seismic network, it has tsunami forecasting and warning capability only for locations in the Pacific.

Tsunami preparedness requires adequate systems to address detection and warning; research, education and preparedness; hazard mitigation; and international participation and cooperation. The United States tsunami warning program, first established in 1948, is run by NOAA through 2 tsunami warning centers, located in Hawaii and Alaska, which collate and analyze seismic data from the USGS, sea level data from numerous coastal monitoring stations, and pressure data from an array of 6 Deep-ocean Assessment and Reporting of Tsunami (DART) buoys.

The 2 tsunami warning centers that serve the United States and international systems are the Richard H. Hagemeyer Pacific Tsunami Warning Center located in Ewa Beach, Hawaii, and the West Coast/Alaska Tsunami Warning Center located in Palmer, Alaska.

The Pacific Tsunami Warning Center is responsible for tsunami warnings for Hawaii, American Samoa, Guam, and all other United States interests in the Pacific. It also issues warnings for regional and distant tsunamis in the Pacific Ocean to almost every country around the Pacific Rim and to most Pacific Island States that participate in the International Tsunami Warning System in the Pacific. In 2003 the Pacific Tsunami Warning Center began providing earthquake magnitude and location data to Puerto Rico in the absence of a tsunami warning center in the Atlantic. The Alaska Center issues tsunami warnings for Alaska, British Columbia, Washington, Oregon, and California.

Scientists at both warning centers continually monitor the detection hardware (seismic sensors, sea level gauges and data buoys) to determine whether a tsunami has been generated, its potential magnitude, and where it will strike land. From these evaluations, the warning centers determine whether a tsunami warning is issued, continued, increased to cover a broader area, or terminated. The United States tsunami detection system measures seismic activity, sea level, tidal height, and wave propagation after a seismic event. Seismic data and sea level measurements from coastal tide stations alone cannot provide direct verification that a destructive tsunami is propagating across the Pacific toward distant coastal communities. These limitations resulted in a large number of false alarms (75 percent rate in 1996), which undermined the credibility of the system and incurred large evacuation costs. To improve accuracy and reduce the number of false alarms, these stations have increased in number and have been upgraded to provide real-time reporting. NOAA operates roughly one hundred sea level gauges in conjunction with other organizations in Japan, Russia, Chile, France, and Australia. Today, 33 of the 175 continuously operating NOAA water level stations in the Pacific have been fitted with the software needed to support NOAA's tsunami warning system.

In 2001, further improvements to distant tsunami forecasting were instituted through full deployment of an array of 6 DART buoys, developed by NOAA's Pacific Marine Environmental Laboratory (PMEL). DART systems consist of a seafloor pressure recorder and a moored surface buoy, which transmits the recorded information via a Geostationary Operational Environmental Satellite (GOES) link to ground stations which disseminate the information to NOAA's Tsunami Warning Centers and other offices. Of the 6 buoys deployed, 3 are located in the North Pacific, south of the Alaska Peninsula and Aleutian Islands where they provide data on tsunamis headed toward Hawaii and the United States West Coast, and two are off the Washington and Oregon coast and provide data on tsunami generated along the Cascadia subduction zone as well as those moving toward Washington and Oregon from other areas of the Pacific. The sixth buoy is deployed just south of the equator in the eastern Pacific to provide readings of tsunami generated in South America as they head toward Hawaii and the West Coast.

Another integral part of the tsunami warning system is the National Earthquake Information Center operated by the USGS, which sends out alerts to NOAA's tsunami warning centers based on data received from the Global Seismographic Network (GSN). The GSN consists of 130 international seismographic stations around the world, operated by each host country, most of which

have real-time detection capability. The USGS network of seismic sensors, known as "Earthworm," can detect and describe geologic events around the world, and in 1999, the tsunami warning centers were tied into the USGS "Earthworm," allowing for real time access to the seismic sensors. This provided earlier detection of tsunami-generating events, greater accuracy modeling a potential tsunami, and earlier warnings to affected communities.

Approaches and expectations for tsunami warning and preparedness differ depending upon whether a tsunami is of a local or distant origin. The greatest risk is posed by local tsunami, which may give residents only a few minutes to seek safety and can be devastating in impact. Tsunami of distant origin may give residents more time to evacuate threatened coastal areas, but there is greater need for timely and accurate assessment of the hazard to avoid costly false alarms. The National Tsunami Hazard Mitigation Program (NTHMP) is a Federal-State partnership consisting of NOAA, USGS, the Federal Emergency Management Agency (FEMA), and the States of Alaska, California, Hawaii, Oregon, and Washington. This program was established through Congressional action following the 1992 earthquake and tsunami off of California, for which no warning was issued because of outdated detection instrumentation and technology. The resulting NTHMP consists of 3 program areas: (1) warning guidance (relating to the detection system); (2) mitigation; and (3) hazard assessment.

NTHMP's Mitigation efforts focus on preparing communities at risk before a tsunami strikes to lessen the impact. This includes educating the community, local businesses, planners, emergency managers and government officials on the risk of tsunami, tsunami hazard signs, evacuation routes, and how to recognize and respond to signs of an impending tsunami. In addition, under NOAA's voluntary Tsunami Ready Program, a community is certified as "Tsunami Ready" based on its establishment of an emergency operations center, the ability to disseminate tsunami warnings, a tsunami hazard plan, community awareness, and the ability to receive multiple tsunami warnings. As of March 9, 2005, there were 16 Tsunami Ready communities located throughout the west coast States and Hawaii.

Another mitigation facet is Hazard Guidance, which develops inundation mapping to determine areas prone to flooding from tsunami. This goal of developing inundation maps for every at-risk coastal community is carried out by NOAA's Center for Tsunami Inundation Mapping Efforts (TIME), which works closely with the States to develop mapping standards, quality control criteria, and certification requirements.

Continuous improvement of tsunami warnings, mitigation, and hazard preparedness efforts requires a coordinated research program. NOAA's Tsunami Research Program is headquartered at PMEL, in Seattle, Washington. The program provides research support to all aspects of the tsunami program in the United States. This includes the continued development of the DART buoy system; inundation modeling for TIME; maintaining a database of tsunami events and data from these events; tsunami modeling at the Pacific Disaster Center and the Maui High Performance Computer Center; and any other research related to the NTHMP.

The United States system needs to be repaired and expanded to improve detection and warning accuracy, and to cover areas not currently included. Of NOAA's 6 DART buoys, 3 were out of service at the start of 2005 (2 off the coast of the Aleutian Islands and 1 off the coast of the Washington-Oregon border), and the overall quality of the buoys' performance has decreased 50 percent over the past 15 months. This reduced coverage impaired NOAA's ability both to detect and warn of a tsunami and also identify costly false alarms. Strengthening reliability of the detection system and further development of a real-time two-way warning system will greatly contribute to the security and well-being of United States coastal communities. Improved mapping and community preparedness is also a key component of any effective warning system, and not all vulnerable communities have been determined to be Tsunami Ready.

On January 14, 2005, the Administration announced its plan for an improved tsunami warning system throughout the entire Pacific, Caribbean, and mid-Atlantic oceans, including increased preparedness and research activities. The plan envisions the establishment of an integrated global tsunami warning system that will be part of the Global Earth Observation System of Systems (GEOSS), an international effort by 54 participating nations (including India, Indonesia, and Thailand) to establish a system that will include improved coastal topography, ocean floor bathymetry, real-time data from tide gauges, enhanced communications systems, regional warnings, and improved information dissemination.

LEGISLATIVE HISTORY

The Tsunami Preparedness Act (S. 50) was introduced by Senator Inouye and Senator Stevens in the Senate on January 24, 2005, and referred to the Senate Committee on Commerce, Science, and Transportation. There are 23 cosponsors of S. 50 including Senators Burns, Boxer, Smith, Cantwell, Snowe, Kerry, Bill Nelson, and Lautenberg. The Committee held a hearing on the bill on February 2, 2005. On March 10, 2005, the Committee considered the bill in open Executive Session. Senators Inouye, Stevens, Smith and Cantwell offered a substitute amendment to the bill, making a number of technical and conforming changes to the bill as introduced, and adding new sections, including section 3(d) on data management, and section 7(e) encouraging the Administrator to seek cost sharing for international activities. The substitute also added a new section 8, entitled Coastal Community Vulnerability and Adaptation Program, which would encourage collaboration among Federal, State, local, and regional efforts to improve preparedness for all coastal hazards through a small suite of regional pilot projects. The program would be authorized at $5 million annually for FY 2006 through 2012. The Committee, without objection, adopted the substitute amendment and ordered the bill reported as amended.

ESTIMATED COSTS

In accordance with paragraph 11(a) of rule XXVI of the Standing Rules of the Senate and section 403 of the Congressional Budget Act of 1974, the Committee provides the following cost estimate, prepared by the Congressional Budget Office:

S. 50—Tsunami Preparedness Act

Summary: S. 50 would direct the National Oceanic and Atmospheric Administration to establish and implement new programs to research, detect, monitor, and mitigate the effects of tsunamis in the Pacific and Atlantic oceans. The bill would direct the agency to upgrade and improve existing systems and data management efforts and would authorize it to provide technical and financial aid to those affected by tsunamis, including local and international entities. For those purposes, the bill would authorize the appropriation of $40 million for each of fiscal years 2006 through 2012, including $8 million annually for pilot projects to assess the vulnerability of coastal areas of the United States.

CBO estimates that implementing S. 50 would cost a total of $124 million over the 2006–2010 period, assuming appropriation of the amounts authorized. We estimate that about $136 million would be spent after 2010, including $80 million authorized to be appropriated for 2011 and 2012. Enacting S. 50 could affect direct spending, but CBO estimates any offsetting receipts and subsequent spending would not exceed $500,000 in any year. Enacting the bill would not affect revenues.

S. 50 contains no intergovernmental or private-sector mandates as defined in the Unfunded Mandates Reform Act (UMRA). Coastal states and local communities would benefit from the programs and grants authorized in this bill. Any costs they face to participate in those programs would be incurred voluntarily.

Estimated cost to the Federal Government: The estimated budgetary impact of S. 50 is shown in the following table. The costs of this legislation fall within budget function 300 (natural resources and environment).

	By fiscal year, in millions of dollars—				
	2006	2007	2008	2009	2010
Authorization Level	40	40	40	40	40
Estimated Outlays	8	16	20	40	40

For this estimate, CBO assumes that S. 50 will be enacted by the beginning of 2006 and that the entire amounts authorized will be appropriated for each year. Estimated outlays are based on historical spending patterns of similar scientific programs. Some of the costs of carrying out a global tsunami warning and mitigation program may be offset by reimbursements from other countries participating in the program, but CBO estimates that such reimbursements would be less than $500,000 annually.

Intergovernmental and private-sector impact: S. 50 contains no intergovernmental or private-sector mandates as defined in UMRA. Coastal states and local communities would benefit from the programs and grants authorized in this bill. Any costs they face to participate in those programs would be incurred voluntarily.

Estimate prepared by: Federal Costs: Deborah Reis; Impact on State, Local, and Tribal Governments: Theresa Gullo; and Impact on the Private Sector: Jean Talarico.

Estimate approved by: Peter H. Fontaine, Deputy Assistant Director for Budget Analysis.

REGULATORY IMPACT STATEMENT

In accordance with paragraph 11(b) of rule XXVI of the Standing Rules of the Senate, the Committee provides the following evaluation of the regulatory impact of the legislation, as reported:

NUMBER OF PERSONS COVERED

The reported bill would establish a national tsunami warning system within NOAA and authorize appropriations for the program for fiscal years 2006 through 2012. It does not authorize any new regulations and therefore will not subject any individuals or businesses to new regulations.

ECONOMIC IMPACT

Section 8 authorizes $35 million to the Administrator of NOAA for each of fiscal years 2006 through 2012 to carry out the purposes of S. 50. An additional $5 million shall be provided to NOAA for FY 2006 through 2012 for activities carried out under section 8. These funding levels are not expected to have an inflationary impact on the nation's economy.

PRIVACY

The reported bill will not have any adverse impact on the personal privacy of individuals.

PAPERWORK

The reported bill will not increase paperwork requirements for the private sector. Those non-governmental partners that participate in the Tsunami Research Program established in section 5 would likely increase their development of detection, prediction, communication, and mitigation science and technology for tsunami forecasts and warnings. Also, communities and their respective local governmental entities that participate in the Integrated Coastal Vulnerability and Adaptation Program will need to develop vulnerability maps for potential hazards, better integration of risk management with community planning, training of public officials in risk management leadership, development of risk assessment technologies, creation of new data services to support the new risk management activities, and development of new risk communications systems.

SECTION-BY-SECTION ANALYSIS

Sec. 1. Short title

Section 1 establishes the short title of the bill as the "Tsunami Preparedness Act."

Sec. 2. Findings and purposes

Section 2(a) sets forth the findings for the Act.

Section 2(b) sets forth the purposes for the Act, which are: (1) to improve tsunami detection, forecast, warnings, notification, preparedness, and mitigation in the United States and elsewhere in the world; (2) to improve the existing Pacific Tsunami Warning System and expand detection and warning systems to 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; (4) to provide technical and other assistance to speed international efforts to establish regional tsunami warning systems in vulnerable areas worldwide; 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

Section 3(a) directs the Administrator of NOAA to operate regional tsunami warning systems for the Pacific Ocean region and the region encompassing the Atlantic Ocean, Caribbean, and Gulf of Mexico.

Section 3(b) states that the system shall consist of both a Pacific tsunami warning system, to cover the entire Pacific Ocean area, including the Western, Central, North, Eastern, South, and Arctic areas, as well as an Atlantic and Caribbean system. The Atlantic and Caribbean system would cover areas that the Administrator determines to be geologically active or have the potential for geological activity, and pose measurable risks of tsunami for States along the coastal areas of the Atlantic Ocean or the Gulf of Mexico. The section also states that the system shall (1) utilize an array of deep ocean detection buoys; (2) include an associated tide gauge system; (3) include any other sensors needed to support related ocean and earth observing systems); (4) provide for cooperation between NOAA and the USGS; (5) provide for information and data processing through the tsunami warning centers; (6) be integrated into United States and global ocean and earth observing systems, including the Global Earth Observing System of Systems; and (7) provide a communications infrastructure for at-risk tsunami communities. This section also directs the Administrator to leverage assistance and assets of the United States Coast Guard and United States Navy in deploying and maintaining detection buoys.

Section 3(c) directs the Administrator to establish tsunami warning centers to provide a link between detection and warning systems and the tsunami hazard mitigation program, including the Pacific Tsunami Warning Center in Hawaii and the West Coast/Alaska Tsunami Warning Center in Alaska. The responsibilities of these centers shall include (1) continuous monitoring of data from seismological, deep ocean, and tidal monitoring stations and the provision of this data to the national tsunami archive; (2) evaluating earthquakes that have potential to generate tsunami; (3) evaluating deep ocean buoy and tidal monitoring station data; and (4) disseminating information and warning bulletins for local and distant tsunami.

Section 3(d) directs the Administrator to maintain a national and regional data management system to address the data requirements of the tsunami detection and monitoring system, including (1) quality control and assurance; (2) archival and maintenance of data; (3) support integration of data from the tsunami observation system with data from other observation systems; and (4) support the development and access of data products to the assessment and adaptation programs covered in section 8.

Sec. 4. Tsunami hazard mitigation program

Section 4(a) authorizes the Administrator to conduct a community-based tsunami hazard mitigation program to improve tsunami preparedness of at-risk areas.

Section 4(b) requires the Administrator to establish a coordinating committee consisting of representatives of NOAA, USGS, the Federal Emergency Management Agency (FEMA), the National Science Foundation (NSF), the National Institute of Standards and Technology (NIST), and affected coastal States and territories. This section envisions the inclusion of State, local and non-governmental entities, such as academic institutions, in the program.

Section 4(c) sets forth, as components of the tsunami hazard mitigation program, the following: (1) improving the quality and extent of inundation mapping; (2) promoting and improving community outreach and education networks and programs; (3) integrating tsunami awareness, preparedness, and mitigation programs into ongoing hazard warnings and risk management programs in affected areas; (4) promoting the adoption of tsunami warning and mitigation measures by Federal, State, tribal, and local government and non-government entities; (5) developing tsunami-specific rescue and recovery guidelines, with FEMA as the lead agency; (6) requiring budget coordination through the Administration to ensure that participating agencies provide necessary funds; and (7) providing for periodic external review of the program.

Sec. 5. Tsunami research program

Section 5(a) requires the Administrator to establish, in coordination with other agencies and academic institutions, a tsunami research program to develop detection, prediction, communication, and mitigation science and technology that supports tsunami forecasts and warnings. This program will include sensing techniques, tsunami tracking, and forecast modeling to (1) help determine whether an earthquake or seismic event will result in a tsunami, and the likely path, severity, duration and travel time of a tsunami; (2) develop techniques and technologies that may be used to quickly and effectively communicate tsunami warnings and forecasts; (3) develop techniques and technologies to support evacuation products; and (4) develop techniques for utilizing remote sensing technologies in rescue and recovery situations.

Section 5(b) directs the Administrator, in consultation with the Assistant Secretary of Commerce for Communications and Information and the Federal Communications Commission, to investigate the potential for improved communications systems for tsunami and other hazard warnings, including telephones, wireless and satellite technology, the Internet, automatic alert televisions and radios; innovative and low-cost combinations of such technologies; and other technologies that may be developed.

Sec. 6. Tsunami system upgrade

Section 6(a) directs the Administrator to (1) authorize the direct and immediate repair of existing deep ocean detection buoys; (2) ensure the deployment of an array of deep ocean detection buoys; and (3) ensure expansion and upgrade of the tide gauge network.

Section 6(b) sets forth requirements for the Administrator in carrying out this section with respect to the transfer of technology,

maintenance and upgrades, including: (1) promulgating specifications and standards for forecast, detection, and warning systems; (2) developing and executing a plan for the transfer of technology from ongoing research to long-term operations; (3) ensuring the maintenance and operation of detection equipment; (4) obtaining priority treatment in budgeting for the acquiring, transporting, and maintenance of tsunami detection system equipment; and (5) ensuring the integration of the tsunami detection system with other United States and global and coastal observation systems.

Section 6(c) requires that, before appropriated amounts are obligated or expended for the acquisition of services for construction or deployment of tsunami detection equipment, the Administrator must certify to the Senate Committee on Commerce, Science, and Transportation and the House of Representatives Committees on Science and Resources within 60 calendar days after the President submits the Budget of the United States that: (1) each contractor has met contract requirements; (2) constructed equipment is capable of becoming fully operational without additional expenditures of appropriated funds; and (3) there are no foreseeable delays in deployment and operation.

Section 6(d) requires that the Administrator notify the Senate Committee on Commerce, Science, and Transportation, and the House of Representatives Committees on Science and Resources of impaired regional detection coverage due to equipment or system failure, and significant contractor failures or delays in completing work associated with the tsunami detection and warning system.

Section 6(e) requires the Administrator to submit 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.

Section 6(f) requires the National Academy of Sciences to review the tsunami detection, forecast, and warning system, and transmit a report on its findings and 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.

Sec. 7. Global tsunami warning and mitigation network

Section 7(a) requires the Administrator, in coordination with the other members of the United States Interagency Committee of the National Tsunami Mitigation Program, to 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.

Section 7(b) directs the Administrator to establish and operate an International Tsunami Information Center (Center) for all nations participating in the International Tsunami Warning System of the Pacific and other nations participating in UNESCO's global tsunami warning system. The Center's responsibilities will include (1) monitoring international tsunami warnings in the Pacific; (2) assisting member States in establishing their own tsunami warning systems; (3) maintaining a library of tsunami-related materials for use by the global scientific community; and (4) dissemination of tsunami related information.

Section 7(c) directs the Administrator to give priority to assisting nations in identifying vulnerable coastal areas, creating inundation maps, obtaining and designing detection and reporting equipment, and establishing communication and warning networks. It also states that the Administrator may establish a process for the transfer of detection and communication technology to affected nations in order to establish an international tsunami warning system and that the Administrator shall provide technical and other assistance to support international tsunami education, response, vulnerability, and adaptation programs.

Section 7(d) prohibits the Administrator from providing assistance 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.

Section 7(e) directs the Administrator, in coordination with the Secretary of State, to seek financial assistance from participating nations in order to ensure a fully functional global tsunami warning system.

Section 7(f) allows the Administrator to accept payment to, or reimbursement of NOAA from, or on the behalf of, international organizations and foreign authorities, for expenses incurred by the Administrator in carrying out any activity under this Act.

Sec. 8. Coastal community vulnerability and adaptation program

Section 8(a) directs the Administrator to establish an Integrated Coastal Vulnerability and Adaptation Program focused on improving the resilience of coastal communities to natural hazards and disasters. The following 6 areas of activity are suggested: (1) development of vulnerability maps for coastal communities to a wide array of potential hazards; (2) efforts to better integrate risk management with community planning; (3) risk management leadership training for public officials; (4) development of risk assessment technologies; (5) new data services to support the new risk management activities; (6) new risk communication systems.

Section 8(b) directs the Administrator to begin three regional pilot projects incorporating the activities described in section 8(a). These projects should begin no more than one year after the enactment of this bill and provide regional assessments of United States coastal vulnerability to hazards associated with tsunami and other coastal hazards including sea level rise, increases in severe weather events, and climate variability and change. Regional assessments should consider the social, physical, and economic impacts of such hazards. The assessments should also include a description of ways to enhance the resilience of at-risk communities, economic sectors and natural resources.

Section 8(c) identifies the selection criteria to be used in picking appropriate regional pilot projects. These include (1) vulnerability to the hazards discussed above; (2) dependence on economic sectors and resources that may be particularly at risk; (3) opportunities to link and use existing risk management programs; (4) evidence of strong interagency collaboration in the area of risk management; and (5) access to NOAA and other Federal programs, facilities, and infrastructure.

Section 8(d) directs the Administrator to submit regional adaptation plans to Congress three years after the implementation of the pilot programs. These plans should be based on the regional assessments discussed in section 8(b) and be developed with the participation of agencies at all levels of government as well as various non-governmental entities that have a stake in the pilot projects. The assessments should include recommendations for (1) targets and strategies for addressing the hazards discussed above; (2) short and long term adaptation strategies; (3) Federal flood insurance programs; (4) areas that have been identified as high risk; (5) enhancing the effectiveness of State coastal zone management programs in mitigating the hazards discussed above; (6) mitigation incentives; (7) land and property owner education; (8) economic plans for small at risk communities; and (9) funding requirements and mechanisms.

Section 8(e) directs the Administrator to establish a coordinated program to provide technical planning and assistance to coastal States, tribes and local governments as they implement strategies developed under this section. This program would also make available to these same entities all products, information, tools, and technical expertise generated through the regional assessments and adaptation plans.

Sec. 9. Authorization of appropriations

Section 9 authorizes $35 million to the Administrator of NOAA for each of fiscal years 2006 through 2012 to carry out the purposes of this Act. An additional $5 million shall be provided to NOAA for FYs 2006 through 2012 for activities carried out under section 8, of which at least $3 million is to be used for the pilot programs annually.

CHANGES IN EXISTING LAW

In compliance with paragraph 12 of rule XXVI of the Standing Rules of the Senate, the Committee states that the bill as reported would make no change to existing law.

○