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REPORT
109–698

UNITED STATES TSUNAMI WARNING AND EDUCATION ACT

SEPTEMBER 28, 2006.—Committed to the Committee of the Whole House on the State of the Union and ordered to be printed

Mr. BOEHLERT, from the Committee on Science, submitted the following

R E P O R T

[To accompany H.R. 1674]

[Including cost estimate of the Congressional Budget Office]

The Committee on Science, to whom was referred the bill (H.R. 1674) to authorize and strengthen the tsunami detection, forecast, warning, and mitigation program of the National Oceanic and Atmospheric Administration, to be carried out by the National Weather Service, and for other purposes, having considered the same, report favorably thereon with an amendment and recommend that the bill as amended do pass.

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I. AMENDMENT

The amendment is as follows:

Strike all after the enacting clause and insert the following:

SECTION 1. SHORT TITLE.

This Act may be cited as the "United States Tsunami Warning and Education Act".

SEC. 2. PURPOSES.

The purposes of this Act are—

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

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

(3) to improve mapping, modeling, research, and assessment efforts to improve tsunami forecasting, preparedness, mitigation, response, and recovery;

(4) to improve and increase education and outreach activities and ensure that those receiving tsunami warnings and the at-risk public know what to do when a tsunami is approaching;

(5) 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

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

SEC. 3. TSUNAMI FORECASTING AND WARNING PROGRAM.

(a) IN GENERAL.—The Administrator of the National Oceanic and Atmospheric Administration, through the National Weather Service, shall operate a program to provide tsunami forecasting and warnings for the Pacific Ocean region and for the Atlantic Ocean, Caribbean Sea, and Gulf of Mexico region.

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

(1) include the tsunami warning centers established under subsection (d);

(2) provide tsunami forecasting capability based on models and measurements, including tsunami inundation models and maps for use in increasing the preparedness of communities, including through the TsunamiReady program;

(3) include a cooperative effort among the National Oceanic and Atmospheric Administration, the United States Geological Survey, and the National Science Foundation under which the Geological Survey and the National Science Foundation shall provide rapid and reliable seismic information to the National Oceanic and Atmospheric Administration from international and domestic seismic networks;

(4) provide a capability for the dissemination of warnings to at-risk States and tsunami communities through rapid and reliable notification to government officials and the public through such means as the National Oceanic and Atmospheric Administration weather radio and the All Hazard Alert Broadcasting Radio; and

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

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

(1) a Pacific tsunami warning system capable of forecasting tsunamis anywhere in the Pacific Ocean region and providing adequate warnings; and

(2) an Atlantic Ocean, Caribbean Sea, and Gulf of Mexico tsunami warning system capable of forecasting tsunamis and providing adequate warnings in areas of the Atlantic Ocean, Caribbean Sea, and Gulf of Mexico that are determined—

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

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

(d) TSUNAMI WARNING CENTERS.—

(1) IN GENERAL.—The Administrator, through the National Weather Service, shall maintain or establish—

(A) a Pacific Tsunami Warning Center in Hawaii;

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

(C) any additional forecast and warning centers determined by the National Weather Service 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 tsunamis;

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

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

(E) coordinating with the tsunami hazard mitigation program described in section 4 to ensure ongoing sharing of information between forecasters and emergency management officials; and

(F) making data gathered under this Act and post-warning analyses conducted by the National Weather Service available to researchers.

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

(1) IN GENERAL.—In carrying out this section, the National Weather Service shall—

(A) develop requirements for the equipment used to forecast tsunamis, which shall include provisions for multipurpose detection platforms, reliability and performance metrics, and to the maximum extent practicable how the equipment will be integrated 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; and

(B) develop and execute a plan for the transfer of technology from ongoing research described in section 5 into the program under this section.

(2) REPORT TO CONGRESS.—(A) Not later than 1 year after the date of enactment of this Act, the National Weather Service shall transmit to Congress a report on how the tsunami forecast system under this section will be integrated 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.

(B) Not later than 3 years after the date of enactment to this Act, the National Weather Service shall transmit a report to Congress on how technology developed under section 5 is being transferred into the program under this section.

(f) CONGRESSIONAL NOTIFICATIONS.—The Administrator shall notify the Senate Committee on Commerce, Science, and Transportation and the House of Representatives Committee on Science within 3 months of—

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

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

(g) EXTERNAL REVIEW.—The Administrator of the National Oceanic and Atmospheric Administration shall enter into an arrangement with the National Academy of Sciences to review the tsunami detection, forecast, and warning program operated by the National Weather Service 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. The review shall also include an assessment of how well the forecast equipment has been integrated into other United States and global ocean and coastal observation systems and the global earth observing system of systems. Not later than 2 years after the date of enactment of this Act, the Administrator shall transmit a report containing the National Academy of Sciences' recommendations, the Administrator's responses to the recommendations, including those where the Administrator disagrees with the Academy, a timetable to implement the accepted recommendations, and the cost of implementing all the Academy's recommendations, to the Senate Committee on Commerce, Science, and Transportation and the House of Representatives Committee on Science.

SEC. 4. NATIONAL TSUNAMI HAZARD MITIGATION PROGRAM.

(a) IN GENERAL.—The Administrator of the National Oceanic and Atmospheric Administration, through the National Weather Service, shall conduct a community-

based tsunami hazard mitigation program to improve tsunami preparedness of at-risk areas in the United States and its territories.

(b) COORDINATING COMMITTEE.—In conducting the program under this section, the Administrator shall establish a coordinating committee comprising representatives of Federal, State, local, and tribal government officials. The Administrator may establish subcommittees to address region-specific issues. The committee shall—

(1) recommend how funds appropriated for carrying out the program under this section will be allocated;

(2) ensure that areas described in section 3(c) in the United States and its territories can have the opportunity to participate in the program; and

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

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

(1) use inundation models that meet a standard of accuracy defined by the National Oceanic and Atmospheric Administration to improve the quality and extent of inundation mapping, including assessment of vulnerable inner coastal and nearshore areas, in a coordinated and standardized fashion to maximize resources and the utility of data collected;

(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;

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

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

SEC. 5. TSUNAMI RESEARCH PROGRAM.

The Administrator of the National Oceanic and Atmospheric Administration shall, in consultation with other agencies and academic institutions, and with the Coordinating Committee established under section 4(b), establish or maintain a tsunami research program to develop detection, forecast, communication, and mitigation science and technology, including advanced sensing techniques, information and communication technology, data collection, analysis, and assessment for tsunami tracking and numerical forecast modeling. Such research program shall—

(1) consider other appropriate research to mitigate the impact of tsunamis;

(2) coordinate with the National Weather Service on technology to be transferred to operations;

(3) include social science research to develop and assess community warning, education, and evacuation materials; and

(4) ensure that research and findings are available to the scientific community.

SEC. 6. GLOBAL TSUNAMI WARNING AND MITIGATION NETWORK.

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

(b) INTERNATIONAL TSUNAMI INFORMATION CENTER.—The Administrator of the National Oceanic and Atmospheric Administration, through the National Weather Service, in cooperation with the Intergovernmental Oceanographic Commission, 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 Intergovernmental Oceanographic Commission. As part of its responsibilities around the world, the Center shall—

(1) monitor international tsunami warning activities around the world;

(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) DETECTION EQUIPMENT; TECHNICAL ADVICE AND TRAINING.—In carrying out this section, the National Weather Service—

(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.

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

SEC. 7. AUTHORIZATION OF APPROPRIATIONS.

There are authorized to be appropriated to the Administrator of the National Oceanic and Atmospheric Administration to carry out this Act—

(1) $26,000,000 for fiscal year 2006, of which—

(A) 62 percent shall be for the tsunami forecast and warning systems under section 3 and international activities under section 6;

(B) 30 percent shall be for the tsunami hazard mitigation program under section 4; and

(C) 8 percent shall be for the tsunami research program under section 5;

(2) $30,000,000 for fiscal year 2007, of which—

(A) 66 percent shall be for the tsunami forecast and warning systems under section 3 and international activities under section 6;

(B) 26 percent shall be for the tsunami hazard mitigation program under section 4; and

(C) 8 percent shall be for the tsunami research program under section 5; and

(3) $30,000,000 for fiscal year 2008, of which—

(A) 66 percent shall be for the tsunami forecast and warning systems under section 3 and international activities under section 6;

(B) 26 percent shall be for the tsunami hazard mitigation program under section 4; and

(C) 8 percent shall be for the tsunami research program under section 5.

II. PURPOSE OF THE BILL

The purpose of H.R. 1674, the United States Tsunami Warning and Education Act, is to improve tsunami detection, forecasting, warnings, notification, preparedness, and mitigation to protect life and property in the United States and to assist the international community in the development of an integrated global tsunami warning and education system.

III. BACKGROUND AND NEED FOR THE LEGISLATION

Indian Ocean Basin Tsunami

On December 26, 2004, an estimated magnitude 9.2 undersea earthquake off the west coast of northern Sumatra, Indonesia, unleashed a tsunami that affected more than 12 countries throughout Southeast Asia and stretched as far as the Northeastern African coast. Massive tsunami waves hit the Indonesian coast within minutes of the earthquake, and other deadly waves raced across the entire 3,000-mile span of the Indian Ocean Basin within hours. Current estimates indicate that at least 150,000 people were killed, and millions more were injured, displaced or otherwise affected. Experts believe that the earthquake that caused the tsunami was the most powerful in 40 years and the fourth largest in the last century. The death toll appears to be the worst on record for a tsu-

nami. Most experts agree that thousands of lives could have been saved if an adequate tsunami detection, warning and education program had existed in these areas.

Tsunamis in the United States

While no tsunami has caused equivalent devastation in the U.S., tsunamis have hit the U.S. in recent decades, and almost all of the major ones were generated in the Pacific Ocean.

In 1946, an earthquake along the Aleutian fault (Alaska) produced waves up to 55 feet high, destroying the City of Hilo's waterfront (Big Island, Hawaii). The tsunami killed 159 people and caused $255 million in damage (in today's dollars). In response to this event the Federal government established the Pacific Tsunami Warning Center in Hawaii in 1948.

In 1960, a magnitude 9.5 earthquake, the most powerful earthquake in the 20th century, occurred off the coast of Chile. The resulting Pacific-wide tsunami reached Hawaii with waves as high as 35 feet, causing 61 deaths and $155 million in damages (in today's dollars).

In 1964, a magnitude 9.2 earthquake, the largest earthquake in the Northern Hemisphere in the 20th century, occurred in Alaska. The resulting tsunami devastated five of Alaska's seven largest communities and nearly destroyed the Alaskan fishing industry. Waves also reached the entire California coastline with heights of 7 to 21 feet. Half of the waterfront district in Crescent City, CA was destroyed. The tsunami killed more than 120 people in the U.S. and Canada and caused a total of $515 million in damage (in today's dollars).

Many experts predict that an earthquake similar in magnitude and proximity to the shore as that which occurred in Sumatra has a 10 to 15 percent chance of striking the West Coast of the U.S. within the next 50 years. Such a tsunami would wreak havoc on the West Coast within minutes, before any warnings could likely be issued. Therefore, the best way to save lives during such an event is for States and local officials to develop evacuation and disaster plans and educate the public about what it must do immediately after feeling the ground shake.

From June 14 to June 17, 2005, four earthquakes, the largest being a magnitude 7.2, shook the West Coast. While, fortunately, none of the earthquakes caused a tsunami, news reports highlighted the fragmented and divergent warning systems and responses from State and local officials and the public. These events further showed the need for a coordinated education and outreach plan.

Existing U.S. Tsunami Warning System

To protect the U.S., the National Oceanic and Atmospheric Administration (NOAA) operates two tsunami warning centers, one in Alaska and one in Hawaii. The Hawaiian center dates back to 1948, and the entire warning system as it exists today, which includes tsunami-detecting buoys, has been in place since 2001. But, because there are no tsunami-detecting buoys or other detection equipment in the Indian Ocean Basin, the U.S. warning centers were unable to adequately forecast the December 2004 Indian Ocean Basin tsunami or send warnings to the affected nations in

time to be helpful. If the disaster had occurred in the Pacific Ocean, some experts question whether the U.S. would have been adequately prepared, because three of the six special tsunami-detecting buoys the U.S. has deployed in the Pacific Ocean were not functioning at the time. The U.S. has no tsunami detection and warning systems in place for the coastal areas of the Atlantic Ocean, Gulf of Mexico or Caribbean Sea, areas that face at least some risk of tsunamis.

Administration Tsunami Plan

On January 14, 2005, in response to the Indian Ocean Basin tsunami, the Administration announced an interagency plan to improve U.S. risk assessment, detection and warning capabilities, and disaster planning for tsunamis. The plan would cost $37.5 million over Fiscal Years 2005 and 2006, with about $24 million for NOAA and about $13.5 million for the United States Geological Survey (USGS). Most of the proposed funding for NOAA would be used to procure and deploy 32 special tsunami-detecting buoys, while funding for USGS would be to upgrade and expand its seismic sensor network. This legislation is based on the Administration's proposal. H.R. 1674 authorizes the tsunami activities at NOAA and addresses concerns that a number of experts voiced regarding deficiencies in the Administration's proposal, most notably, a lack of emphasis on education and outreach activities.

IV. SUMMARY OF HEARINGS

The House Committee on Science held a hearing January 26, 2005, on "Tsunamis: Is the U.S. Prepared?" The hearing focused on the causes of tsunamis, the risks they pose to the U.S. and to the rest of the world, and how the U.S. should prepare for them.

The Committee heard from: (1) The Honorable Jay Inslee, Member, U.S. House of Representatives; (2) Dr. Charles "Chip" Groat, Director of the United States Geological Survey; (3) Gen. David L. Johnson (ret.), Director of the National Oceanic and Atmospheric Administration's National Weather Service; (4) Dr. John Orcutt, Deputy Director for Research at the Scripps Institution of Oceanography, University of California at San Diego, and President of the American Geophysical Union; (5) Dr. Arthur Lerner-Lam, Director of the Columbia Center for Hazards and Risk Research, Lamont-Doherty Earth Observatory, Columbia University; and (6) Mr. Jay Wilson, Coordinator of Earthquake and Tsunami Programs, Plans and Training Section, Oregon Emergency Management.

Congressman Inslee testified that the country will experience future earthquakes and tsunamis and that many areas in the country are at risk. He stated that the U.S. needs to deploy significantly more tsunami-detecting buoys to adequately detect tsunamis approaching the U.S. In addition, he argued that buoys would not be sufficient without a warning and education system to provide people on the shorelines with a course of action in the event of an earthquake or tsunami.

Dr. Groat testified that the Pacific Northwest is at significant risk from tsunami-causing earthquakes. He said that under the Administration's proposal USGS would be able to significantly improve earthquake data processing and analysis, which would increase the USGS's ability to determine whether any given earth-

quake is likely to cause a tsunami and to transmit that data more quickly to tsunami forecasters and other officials.

Gen. Johnson stated that under the Administration's proposal NOAA would expand the current tsunami warning system for the U.S. through the installation of 32 new tsunami-detecting buoys and 38 new sea-level monitoring and tide gauges by 2007. Furthermore, the Administration's plan would increase funding for NOAA's TsunamiReady program, he said, which provides education and outreach to vulnerable communities. Finally, the Administration and NOAA support the development of a Global Earth Observation System of Systems (GEOSS), he said, which would link observations taken from many nations and help provide a real-time international tsunami warning capability. This capability did not exist when the Indian Ocean tsunami occurred, he noted. Gen. Johnson stated he supported efforts by Congress to help implement these programs.

Dr. Orcutt stressed that long-term maintenance of the Global Seismic Network (GSN) and tsunami-detection systems is extremely important. He argued that current GSN funding is inadequate. He also testified that there should be a greater emphasis on deployment of inexpensive monitoring technology and suggested that any technology should be integrated with existing systems.

Dr. Lerner-Lam stated that the Administration's proposal should have a greater emphasis on involving regional, State and local agencies in the development of a comprehensive tsunami warning program. He noted that the proposal lacked appropriate funds to develop new technologies. In addition, he stated that the tsunami warning system buoys and tide gauges should be a part of GEOSS, and ensure interoperability of its system with those developed by international partners.

Mr. Wilson discussed the importance of the National Tsunami Hazard Mitigation Program, a Federal/State community-based outreach and education program, and suggested that it be funded at an annual level of at least $7.8 million. This level of funding would be the most cost-effective means of protecting U.S. coastlines by providing long-term support for the state tsunami hazard mapping and mitigation programs, he said. These mapping and mitigation programs provide States and localities with the necessary information to prepare evacuation and disaster plans and to educate the public about the plans, he said.

V. COMMITTEE ACTIONS

On January 26, 2005, the Committee on Science heard testimony from State and Federal officials on the threat that tsunamis posed to the United States, as well as on steps the Federal government should take to mitigate these threats. On April 18, 2005, Congressman Sherwood Boehlert introduced H.R. 1674, the United States Tsunami Warning and Education Act, which was referred to the Committee on Science.

On April 20, 2005, the Subcommittee on Environment, Technology, and Standards considered H.R. 1674, The United States Tsunami Warning and Education Act, and ordered the measure reported favorably, without amendment, by a voice vote.

On May 4, 2005, the Committee on Science met to consider H.R. 1674, and considered the following amendments to the bill:

1. Mr. Boehlert offered a manger's amendment that made technical corrections to the bill based on recommendations from the Administration. The amendment also increased the funding for the National Tsunami Hazard Mitigation Program from $6 million to $7.8 million as recommended by State officials and supported by other Members of the Committee. The amendment was adopted by a voice vote.

2. Mr. Wu offered an amendment to authorize the study of the potential for improving communication systems for tsunami hazards warnings. Mr. Wu made a motion to withdraw his amendment, and by unanimous consent, the request to withdraw the amendment was agreed to.

The motion to adopt the bill as amended passed by a voice vote. Mr. Gordon moved that the Committee favorably report the bill H.R. 1674, as amended, to the House with the recommendation that the bill, as amended, do pass; that the staff be instructed to prepare the legislative report and make necessary technical and conforming changes; and that the Chairman take all necessary steps to bring the bill before the House for consideration. With a quorum present, the motion was agreed to by a voice vote.

VI. SUMMARY OF MAJOR PROVISIONS OF THE BILL, AS REPORTED

H.R. 1674 would:

• Expand tsunami forecasting and warning capability to cover all U.S. coastlines (not just the Pacific). The bill would provide flexibility to NOAA to determine the proper mix of tsunami detection equipment (buoys, tidal gauges, etc.) that it should deploy, but require that the components be integrated with other ocean observing systems.

• Place greater emphasis on tsunami education and outreach activities. The bill would codify the National Tsunami Hazard Mitigation Program, an existing Federal-State partnership, to improve community awareness and preparedness for tsunamis. States would help decide what activities would be funded, such as developing and updating inundation maps and evacuation plans and installing warning sirens.

• Require NOAA to have a dedicated tsunami research program to improve capabilities to detect, forecast, and mitigate tsunami threats with specific research on new buoys, modeling and mapping.

• Direct the National Academy of Sciences to review NOAA's tsunami programs and provide recommendations to improve them.

• Require NOAA to notify Congress within three months if any part of the detection or warning system malfunctions.

• Direct NOAA to provide technical advice and training to the international community. NOAA would provide guidance on detection equipment, identifying and mapping vulnerable coastal areas and developing communication technologies to provide quick and reliable warnings to vulnerable communities.

• Authorize appropriations for NOAA of $26 million in FY 2006, with 62 percent allocated for tsunami forecasting and warning systems and international activities; 30 percent for the National Tsunami Hazard Mitigation Program; and 8 percent for the tsunami research program. For FY 2007 and 2008, the bill would authorize appropriations for NOAA of $30 million, with 66 percent allocated

for tsunami forecast and warning systems and international activities; 26 percent for the National Tsunami Hazard Mitigation Program; and 8 percent for the tsunami research program.

VII. SECTION-BY-SECTION ANALYSIS (BY TITLE AND SECTION), AS REPORTED

Section 1. Short title

The United States Tsunami Warning and Education Act

Section 2. Purposes

Describes the purposes of the Act: (1) to improve tsunami detection, forecasting, warnings, notification, preparedness and mitigation in the U.S.; (2) to enhance and modernize the existing Pacific tsunami warning system and to expand detection and warning systems to the Atlantic Ocean, Caribbean Sea and Gulf of Mexico; (3) to improve tsunami mapping, modeling, research and assessment efforts; (4) to improve and increase education and outreach activities; (5) to provide technical and other assistance to international efforts to establish regional tsunami warning systems in vulnerable areas worldwide, including the Indian Ocean region; and (6) to improve Federal, state, and international coordination for tsunami and other coastal hazard warnings and preparedness.

Section 3. Tsunami forecasting and warning program

Requires NOAA to operate a program to provide tsunami forecasting and warnings for the Pacific Ocean region, and for the Atlantic Ocean, Caribbean Sea and Gulf of Mexico regions.

The components of the program shall include: tsunami warning centers; forecasting capabilities, based on measurements, models and maps; a cooperative effort among NOAA, USGS, and the National Science Foundation (NSF) to provide seismic information; and the capability for the rapid and reliable dissemination of tsunami warnings to States and communities.

Directs the National Weather Service to develop requirements for the equipment used to forecast tsunamis, including how the equipment will be integrated into other United States and global environmental observing systems, and a plan for the transfer of technology from research into operations. Requires the National Weather Service to submit reports to Congress on how it will integrate the equipment and on the technology transfer plan. Also requires the National Weather Service to notify Congress when tsunami forecasting capabilities are impaired for more than three months due to equipment or contractor problems.

Requires the Administrator to enter into an arrangement with the National Academy of Sciences to evaluate and provide recommendations on how to improve NOAA's tsunami detection, forecast and warning activities.

Section 4. National Tsunami Hazard Mitigation Program

Directs the National Weather Service to conduct the National Tsunami Hazard Mitigation Program, a Federal-State partnership to improve community awareness and preparation for tsunamis. Establishes a coordinating committee of Federal and state officials, which shall develop a plan for ensuring wide participation in the

program; determine how funds will be allocated; and provide recommendations to increase resiliency of vulnerable communities. Specifically, the National Tsunami Hazard Mitigation Program will use NOAA models and maps to assess vulnerable areas; promote and improve community outreach and education networks; and integrate tsunami preparedness and mitigation programs into ongoing hazard warnings and planning.

Section 5. Tsunami research program

Requires NOAA to establish a tsunami research program to develop detection, forecasting, communication and mitigation tools and technologies. Directs the research program to work with the National Weather Service on ways to transfer the research into operations.

Section 6. Global tsunami warning and mitigation network

Directs NOAA to provide technical assistance and training to the international community toward the development of a fully functional global tsunami forecast and warning system. Establishes the International Tsunami Information Center to provide information and advice to nations around the world to improve tsunami preparedness.

Section 7. Authorization of appropriations

Authorizes appropriations of $26 million for fiscal year 2006 and $30 million for each of fiscal years 2007 and 2008 to carry out the Act. Specifies that of any funds appropriated for activities under this act for fiscal year 2006, 62 percent should be used for the tsunami forecast and warning systems under section 3 and section 6, 30 percent should be used for the National Tsunami Hazard Mitigation Program under section 4, and 8 percent should be for the tsunami research program under section 5. For each of fiscal years 2007 and 2008, 66 percent should be used for the tsunami forecast and warning systems under section 3 and section 6, 26 percent should be used for the National Tsunami Hazard Mitigation Program under section 4, and 8 percent should be for the tsunami research program under section 5.

VIII. COMMITTEE VIEWS

Section 3. Tsunami forecasting and warning program

The massive destruction and widespread nature of the Indian Ocean Basin tsunami has caused the U.S. to reevaluate its existing system, which currently only has detection capabilities in the Pacific Ocean. The Act requires NOAA to expand its detection and warning system to the areas of the Atlantic Ocean, Gulf of Mexico and Caribbean Sea, which also have some risk of tsunamis. Because of its expertise in seismology and earthquakes, the Committee expects NOAA to work with the USGS on how best to provide coverage and where to deploy technology in these new areas.

The seismic networks operated by the USGS and NSF provide earthquake information that is vital to NOAA's abilities to properly forecast tsunamis, although NOAA does have a few seismic sensors of its own. The Act requires NOAA to work in cooperation with USGS and NSF to ensure information is shared rapidly. The Com-

mittee expects this cooperative effort will enable improvements in collecting and transmitting crucial earthquake data, in forecasting tsunamis, and in issuing tsunami warnings to potentially affected communities, ultimately shaving valuable seconds off the response time to these fast-moving disasters.

To be more cost-effective, provide greater scientific value, and increase support for sustainable funding for the tsunami detection systems, the Act requires NOAA to develop specific requirements for the buoys, including provisions to ensure the equipment will serve multiple purposes and to be integrated into other global observing systems. The Committee will follow this issue closely as the Act also requires NOAA to report to Congress about its integration efforts.

The Committee expects the Administration to utilize and maintain the maximum practicable array of robust detection technologies, including (but not limited to) deep ocean detection buoys (including redundant and spare buoys) and an associated tide-gauge and water level system for long-term continuous operation of tsunami detection, forecasting and warning transmission capabilities.

The Committee expects the Administrator to seek the assistance of the Coast Guard, Navy, and other appropriate Federal agencies when deploying and maintaining tsunami detection technologies.

The Act requires NOAA to contract with the National Academy of Sciences to review NOAA's entire tsunami detection, forecast, and warning program. The Committee expects the review to include consideration of the following specific issues:

- Whether the program is being implemented in the most effective way possible;
- Whether the geographic distribution of the tsunami-detecting buoys and other instruments are optimal; and
- Whether those instruments are sufficiently integrated into other ocean-observing systems so as to ensure the long-term sustainability of the program.

The Committee expects NOAA to follow the Academy's report as it updates and improves tsunami detection, forecast and warning activities.

Section 4. National Tsunami Hazard Mitigation Program

The Committee heard repeatedly from witnesses and outside experts about the importance of education and outreach programs. While buoy technology is important in accurately and quickly forecasting tsunamis, the affected public must know what to do and where to go when a tsunami could be approaching. Unfortunately, in the case of the Indian Ocean Basin tsunami, thousands of lives could have been saved if people had simply known what to do and had sought higher ground upon feeling the earth shake violently.

The Committee expects NOAA to use the National Tsunami Hazard Mitigation Program as the foundation of its education and outreach activities. While the program's focus must expand to include the U.S. states and territories along the Atlantic Ocean, Gulf of Mexico and Caribbean Sea, the Committee expects the program to continue to focus on those areas most vulnerable to a tsunami.

The Committee expects that the Tsunami Hazard Mitigation Program Coordinating Committee will include representatives from

the following federal agencies: the National Oceanic and Atmospheric Administration (chair), the United States Geological Survey (through its earthquake programs), the National Science Foundation, the National Institute of Standards and Technology, and the Federal Emergency Management Administration.

The capability to share information in the event of an emergency is imperative. Development of communication networks must be part of a coordinated effort between coastal community, county, State, and Federal participants.

While the Act does not explicitly spell out how such a communications infrastructure is to be developed, the Committee notes already-existing public-private efforts, and encourages NOAA to work with such local stakeholders to further improve such coastal tsunami warning and communications systems.

The Administration's proposal highlights the National Weather Service's TsunamiReady Program, which certifies that localities have met specific criteria in tsunami disaster planning. However, many States and localities have complained that the TsunamiReady Program does not currently provide funding or adequate advice to communities on how to meet the criteria. The Committee expects NOAA to incorporate the recommendations of the Coordinating Committee to improve the TsunamiReady Program.

Section 5. Tsunami research program

The Committee expects those involved in the research program to coordinate closely with those in the National Weather Service to ensure that the ideas that arise from successful research conducted under this section will be put into operational use.

The Committee expects that the tsunami research program will help develop tools to determine whether an earthquake or other seismic event will result in a tsunami and the likely path, severity, duration, and travel time of a tsunami. Also, the research program shall develop techniques and technologies that may be used to communicate tsunami forecasts and warnings as quickly and effectively as possible to affected communities. The Committee also expects the Administrator to ensure that the research program is coordinated with efforts of other agencies to ensure techniques and technologies are being developed and deployed that would support evacuation information needs, including real-time notice of problems or blockages along tsunami evacuation routes in at-risk areas.

Section 6. Global tsunami warning and mitigation network

In the aftermath of the December 24, 2004 earthquake and tsunami, NOAA officials stated that no formal mechanisms or protocols were in place to warn Indian Ocean Basin nations. The Committee expects NOAA to work with the international community to remedy this situation.

The international community has since held several meetings to examine how best to develop a global tsunami warning system. The Committee is concerned by news reports that many of the nations plan to develop their own independent systems, which could jeopardize the sharing of information and hamper efforts to adequately provide tsunami forecasts and warnings for all nations. The Committee expects the National Weather Service to coordinate with the

State Department to find ways to encourage nations to make their systems interoperable with the U.S. system.

The Committee assumes that the Administration's receipt of reimbursement from international partners will continue under the same procedures in effect on the date of enactment of this Act.

Section 7. Authorization of appropriations

The Committee is concerned that the Administration's tsunami proposal may rely too heavily on expensive buoys and rely too little on education and outreach. To ensure that NOAA strikes a better balance in implementing the Act, the Committee prescribes a percentage of any amounts appropriated for each component of the program and expects NOAA to follow the percentages.

IX. COST ESTIMATE

A cost estimate and comparison prepared by the Director of the Congressional Budget Office under section 402 of the Congressional Budget Act of 1974 has been timely submitted to the Committee on Science prior to the filing of this report and is included in Section X of this report pursuant to House Rule XIII, clause 3(c)(3).

H.R. 1674 contains no new budget authority, credit authority, or changes in revenues or tax expenditures. Assuming that the sums authorized under the bill are appropriated, H.R. 1674 does authorize additional discretionary spending, as described in the Congressional Budget Office report on the bill, which is contained in Section X of this report.

X. CONGRESSIONAL BUDGET OFFICE COST ESTIMATE

U.S. CONGRESS,
CONGRESSIONAL BUDGET OFFICE,
Washington, DC, May 12, 2005.

Hon. SHERWOOD L. BOEHLERT,
Chairman, Committee on Science,
House of Representatives, Washington, DC.

DEAR MR. CHAIRMAN: The Congressional Budget Office has prepared the enclosed cost estimate for H.R. 1674, the United States Tsunami Warning and Education Act.

If you wish further details on this estimate, we will be pleased to provide them. The CBO staff contact is Deborah Reis.

Sincerely,

DOUGLAS HOLTZ-EAKIN,
Director.

Enclosure.

H.R. 1674—United States Tsunami Warning and Education Act

Summary: H.R. 1674 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 Caribbean Sea, and the Gulf of Mexico. The bill would direct the agency to upgrade and improve existing systems and data management efforts and would authorize it to provide technical aid to those affected by tsunamis, including local and international entities. For those purposes, the bill would authorize the appropriation of $26 million for

fiscal year 2006 and $30 million for each of fiscal years 2007 and 2008.

CBO estimates that implementing H.R. 1674 would cost a total of $86 million over the 2006–2010 period, assuming appropriation of the amounts authorized. Enacting H.R. 1674 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.

H.R. 1674 contains no intergovernmental or private-sector mandates as defined by 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 may incur would be from complying with conditions of federal assistance.

Estimated cost to the Federal Government: The estimated budgetary impact of H.R. 1674 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
CHANGES IN SPENDING SUBJECT TO APPROPRIATION					
Authorization Level	26	30	30	0	0
Estimated Outlays	5	15	25	28	13

For this estimate, CBO assumes that H.R. 1674 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: H.R. 1674 contains no intergovernmental or private-sector mandates as defined by UMRA. Coastal states and local communities would benefit from the programs and grants authorized in this bill; any costs they may incur would be from complying with conditions of federal assistance.

Previous CBO estimate: On March 17, 2005, CBO transmitted a cost estimate for S. 50, the Tsunami Preparedness Act, as ordered reported by the Senate Committee on Commerce, Science, and Transportation on March 17, 2005. The two versions of the legislation are similar; however, the House version would authorize a lesser amount of appropriations: S. 50 would authorize the appropriation of $40 million a year for 2006 through 2012.

Estimate prepared by: Federal Costs: Deborah Reis and Mike Waters. Impact on State, Local, and Tribal Governments: Lisa Ramirez-Branum. Impact on the Private Sector: Jean Talarico.

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

XI. COMPLIANCE WITH PUBLIC LAW 104–4

H.R. 1674 contains no unfunded mandates.

XII. COMMITTEE OVERSIGHT FINDINGS AND RECOMMENDATIONS

The Committee on Science's oversight findings and recommendations are reflected in the body of this report.

XIII. STATEMENT ON GENERAL PERFORMANCE GOALS AND OBJECTIVES

The goal of this Act is to improve tsunami detection, forecasting, warnings, notification, preparedness, and mitigation to protect life and property in the United States and assist the international community in the development of an integrated global tsunami warning and education system.

XIV. CONSTITUTIONAL AUTHORITY STATEMENT

Article I, section 8 of the Constitution of the United States grants Congress the authority to enact H.R. 1674.

XV. FEDERAL ADVISORY COMMITTEE STATEMENT

The Act codifies an existing advisory committee.

XVI. CONGRESSIONAL ACCOUNTABILITY ACT

The Committee finds that H.R. 1674 does not relate to the terms and conditions of employment or access to public services or accommodations within the meaning of section 102(b)(3) of the Congressional Accountability Act (Public Law 104–1).

XVII. STATEMENT ON PREEMPTION OF STATE, LOCAL, OR TRIBAL LAW

This bill is not intended to preempt any State, local, or tribal law.

XVIII. CHANGES IN EXISTING LAW MADE BY THE BILL, AS REPORTED

This legislation does not amend any existing Federal statute.

XIX. COMMITTEE RECOMMENDATIONS

On May 4, 2005, a quorum being present, the Committee on Science favorably reported H.R. 1674, the United States Tsunami Warning and Education Act, by a voice vote and recommended its enactment.

XX. COMMITTEE CORRESPONDENCE

U.S. HOUSE OF REPRESENTATIVES
COMMITTEE ON SCIENCE
SUITE 2320 RAYBURN HOUSE OFFICE BUILDING
WASHINGTON, DC 20515-6301
(202) 225-6371
TTY: (202) 226-4410
http://www.house.gov/science/welcome.htm

September 28, 2006

The Honorable Don Young
Chairman
Committee on Transportation and Infrastructure
2165 Rayburn House Office Building
Washington, DC 20515

Dear Mr. Chairman:

Thank you for your letter regarding the consideration of H.R. 1674, the United States Tsunami Warning and Education Act. I appreciate your willingness to work with me to find a way to address your concerns about this bill as it was ordered reported from the Science Committee on May 4, 2005, so that the bill can move expeditiously to the floor.

Thank you for agreeing not to request a sequential referral of H.R. 1674 based on our agreement to modify the bill in a floor amendment. I agree that by not exercising your right to request a referral, the Transportation and Infrastructure Committee does not waive or otherwise affect jurisdiction it may have over H.R. 1674. As you requested, the exchange of letters between our two committees will be included in the Committee report on 1674.

Thank you for your attention to this matter.

Sincerely,

SHERWOOD BOEHLERT
Chairman

cc: The Honorable John V. Sullivan

U.S. House of Representatives
Committee on Transportation and Infrastructure

Washington, DC 20515

Don Young
Chairman

Lloyd A. Jones, Chief of Staff
Elizabeth Megginson, Chief Counsel

James L. Oberstar
Ranking Democratic Member

David Heymsfeld, Democratic Chief of Staff

September 28, 2006

The Honorable Sherwood L. Boehlert
Chairman
Committee on Science
2320 Rayburn Building
Washington, DC 20515

Dear Mr. Chairman:

I am writing to you concerning the jurisdictional interest of the Transportation and Infrastructure Committee in matters being considered in H.R. 1674, the United States Tsunami Warning and Education Act which was ordered reported from the Science Committee on May 4, 2005. This legislation invokes the jurisdiction of the Committee on Transportation and Infrastructure with respect to the Federal Emergency Management Agency and certain mitigation provisions of the bill. I appreciate your willingness to work with me on modifications to the bill which will be reflected in a Floor amendment.

Our Committee recognizes the importance of H.R. 1674 and the need for the legislation to move expeditiously. Therefore, I will not request a sequential referral. This waiver, of course, is conditional on our mutual understanding that nothing in this legislation or my decision to forego a sequential referral waives, reduces or otherwise affects the jurisdiction of the Transportation and Infrastructure Committee.

I would appreciate it if you would include a copy of this letter and your response in the Committee Report on H.R. 1674.

Thank you for your cooperation in this matter.

Sincerely,

Don Young

DON YOUNG
Chairman

cc: Hon. James L. Oberstar
Hon. John V. Sullivan

XXI. CORRESPONDENCE SUPPORTING H.R. 1674

AMERICAN METEOROLOGICAL SOCIETY
Headquarters: 45 Beacon Street, Boston, MA 02108-3693 U.S.A.
Washington Office: 1120 G Street, N.W., Suite 800, Washington, D.C. 20005

Keith L. Seitter, Executive Director
Richard E. Hallgren, Executive Director Emeritus
Ronald D. McPherson, Executive Director Emeritus
Kenneth C. Spengler, Executive Director Emeritus

June 6, 2005

The Honorable Sherwood Boehlert
Chairman
U.S. House of Representatives
Committee on Science
2320 Rayburn House Office Building
Washington, DC 20515

Dear Chairman Boehlert,

On behalf of the American Meteorological Society (AMS), I am writing in support of H.R. 1674, the "United States Tsunami Warning and Education Act." The worldwide effort to detect, forecast, warn, and mitigate tsunamis will be strengthened by a strong U.S. contribution, and is essential if our global society is to prevent another disaster like the one of December 26, 2004.

As you may know, the Director of the AMS Policy Program, Dr. William H. Hooke, wrote an op-ed, *Avoiding a Catastrophe of Human Error,* published in the Washington Post on January 5, 2005, which we have enclosed. His main elements are very consistent with H.R. 1674. First, this bill authorizes new resources to carry out its mission rather than redirecting current resources. In order to show a true commitment to tsunami warnings and education, we must accelerate improvements of our current programs and create new ones. This can only be done with new funding.

Secondly, the bill recognizes that the tsunami detection, forecast, and warning system can be utilized for other natural hazards. Integrating the tsunami system into a global framework, such as the Global Earth Observing System of Systems, not only protects coastal areas from tsunamis, but can also help protect against other hazards like hurricanes and floods, which affect U.S. coastal areas more frequently than tsunamis.

Third, the bill recognizes that a tsunami warning system will work best in combination with an education program to increase public awareness. Many lives could have been saved on December 26, 2004, if more people recognized the signs of an imminent tsunami, and knew to run to higher ground.

Lastly, the bill specifically mentions mitigation. Warnings may save some lives, but many more lives, as well as people's livelihoods, are saved by land use and by building practice that minimizes human exposure to the tsunami risk in the first place, and protects the infrastructure needed to support coastal economies.

In summary, we support H.R. 1674, the Tsunami Warning and Education Act. We believe this is a positive first step in a continuing process to secure our nation from the strength of natural hazards. We thank you for introducing this bill with your colleagues, and we hope that the Congress will continue to improve the safety of our nation from other natural hazards. If you have any questions or need further assistance, please do not hesitate to contact us.

Sincerely,

Walter Lyons
President
American Meteorological Society

Consortium for Oceanographic Research and Education

1201 New York Avenue, NW • Suite 420 • Washington, DC 20005 USA
Tel: (202) 332-0083 • Fax: (202) 332-8887 • E-mail: CORE@COREocean.org • http://www.COREocean.org

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AFFILIATE MEMBERS
Global Environment & Ocean Sciences
HARRIS Corp. Maritime Communications
RD Instruments
The Rosse Company

June 13, 2005

The Honorable Sherwood L. Boehlert
The Honorable Bart Gordon
Chairman and Ranking Member
Committee on Science
2320 Rayburn House Office Building
Washington, DC 20515-6301

Dear Mr. Chairman and Mr. Gordon:

I am writing on behalf of the 83 member institutions of the Consortium for Oceanographic Research and Education (CORE) to express support for H.R. 1674, the United States Tsunami Warning and Education Act. CORE's universities, laboratories, and aquariums work together to develop and promote a common vision and goals for the ocean sciences community.

The United States Tsunami Warning and Education Act will provide the legislative framework for a unified national investment to improve tsunami understanding, preparedness, warnings and response. The bill builds on existing efforts of the National Oceanic and Atmospheric Administration (NOAA) to extend and strengthen detection and warning systems and to establish hazard mitigation, education and outreach, and research programs. In particular, CORE endorses the approaches taken in H.R. 1674 that: (1) increase emphasis on tsunami education and understanding; **(2) establish a tsunami research program;** and (3) foster partnerships among federal agencies, state and local authorities and academic institutions.

CORE applauds the legislation's requirement for NOAA to integrate the tsunami forecast system with other U.S. and global ocean and coastal observation systems and seismic networks. Toward that goal, we suggest that the bill vest authority with NOAA, rather than the National Weather Service, in order to provide greater flexibility within the agency as this integration effort evolves.

We at CORE thank you for your continued commitment to improving public safety and understanding of the oceans, and urge you and your colleagues on the Science Committee to move forward with the United States Tsunami Warning and Education Act.

Sincerely and
very respectfully,

Dick West
President

CORE

THE WEATHER COALITION

EXECUTIVE COMMITTEE

Ray Ban, co-chair
Executive Vice President
The Weather Channel

John Snow, co-chair
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Oklahoma Weather Center

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Edward Bensman
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Atmospheric and Environmental Research (AER) Inc.

Timothy Reinhold
Vice President for Engineering
Institute for Business and Home Safety

Jeremy Usher
President and CEO
Weatherviews, Inc.

David Whelan
Vice President, General Manager and Deputy to the President
Boeing Phantom Works

June 1, 2005

The Honorable Vernon Ehlers
Chairman
Subcommittee on Environment, Standards, and Technology
Committee on Science
U.S. House of Representatives
Washington, DC 20515

FACSIMILE SENT: 202-225-5144

Dear Chairman Ehlers:

On behalf of the Weather Coalition, we provide comments regarding the United States Tsunami Warning and Education Act, H.R. 1674. The Coalition is a diverse group of representatives (list attached) from industry, academia, and science and education consortia. We are committed to improving the country's weather prediction and warning capabilities, and believe that tsunami forecast, warning, and education programs -- all critical to human safety -- can enhance the nation's overall monitoring and prediction infrastructure.

The Weather Coalition strongly supports this important legislation and we look forward to working with the Congress and the Executive Branch to ensure its effective implementation once it has been enacted into law. In particular, we endorse the monitoring component of the bill. The proposed program offers an opportunity to create truly integrated, multi-purpose monitoring systems in the ocean and coastal environments. Multi-purpose systems are not just cost effective -- they also promote good interdisciplinary science, providing researchers with instruments capable of measuring a host of markers at once and so capturing the interactions between ocean waves and wind speed, direction, and air temperature and pressure. Scientists need such multi-purpose platforms to understand Earth's coupled ocean-atmosphere system and so develop the knowledge necessary to obtain the nine important societal benefits areas identified in the U.S. Integrated Earth Observation System Strategic Plan. This is just what the Tsunami Warning and Education Act promises.

c/o Cynthia Schmidt
P.O. Box 3000, Boulder, CO 80301-3000
303 497-2107

THE WEATHER COALITION

We support also the bill's directive to improve tsunami education and outreach activities, which are a crucial complement to enhanced monitoring systems. To save lives and property, technology and research must be combined with a greater public understanding of the tsunami threat and knowledge of how to properly respond. We suggest that Sec. 4.b(1) the proposed legislation be adjusted to read "(1) recommend specific actions and priorities for the allocation of the funds appropriated for carrying out the program under this section;" Experience suggests that a "coordinating committee" of the type described is best suited to help set the programmatic priorities.

We are pleased to see that the bill requires NOAA to collaborate with external partners in its tsunami research program. Such cooperation, which leverages both federal dollars and scientific talent, can serve as a model for future partnerships between researchers in the government, academic, and private sectors.

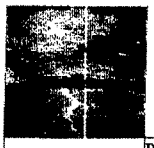
Thank you for the opportunity to comment on this important bill. Thank you also for your continued effective support of the scientific enterprise of this country. Please let us know if we can be of any additional assistance as H.R. 1674 moves through the legislative process.

Sincerely,

Raymond J. Ban
Executive Vice President
The Weather Channel®

John T. Snow
Director, Oklahoma Weather Center
and Dean, College of Geosciences at
The University of Oklahoma

Co-Chairs of the Weather Coalition



The Weather Coalition

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Private Sector

Atmospheric and Environmental Research (AER), Inc.	Science Applications International Corporation (SAIC)
The Boeing Company	Vaisala, Inc.
Meteorlogix, LLC	The Weather Channel®
Raytheon Company	Weathernews, Inc.

Associations and Consortia

American Geophysical Union	National Association of State Universities and Land-Grant Colleges
Institute for Business & Home Safety	Reinsurance Association of America
International Association of Emergency Managers	University Corporation for Atmospheric Research

Universities

University of Alabama at Huntsville Department of Atmospheric Science	Massachusetts Institute of Technology Dept. of Earth, Atmospheric and Planetary Sciences
University of Albany, SUNY Department of Earth and Atmospheric Sciences	University of Missouri Department of Soil, Environmental and Atmospheric Sciences
University of Arizona	North Carolina State University Department of Marine, Earth and Atmospheric Sciences
Arizona State University	University of Oklahoma Oklahoma Weather Center
University of California at Los Angeles	Pennsylvania State University Department of Meteorology
Cornell University Atmospheric Science Program	Purdue University Department of Earth and Atmospheric Sciences
Florida State University Center for Ocean-Atmospheric Prediction Studies Department of Meteorology	Saint Louis University Department of Earth and Atmospheric Science/Cooperative Institute for Precipitation Systems
University of Hawaii School of Ocean and Earth Sciences & Technology	University of Texas at Austin Department of Geological Sciences
University of Illinois at Urbana-Champaign Department of Atmospheric Sciences	University of Washington Department of Atmospheric Sciences
Iowa State University Office of the Vice Provost for Research	

National Association of Marine Laboratories
c/o Marine Biological Laboratory, Woods Hole, MA 02543

Dr. Jeffrey M. Reutter, President
Ohio Sea Grant College Program & FT Stone Laboratory
The Ohio State University, 1314 Kinnear Rd.
Columbus, OH 43212

(614) 292-8949; FAX: 292-4364
Email: reutter.1@osu.edu
www.naml.org
www.sg.ohio-state.edu

June 9, 2005

The Honorable Sherwood L. Boehlert
Chairman
Committee on Science
United States House of Representatives
Washington, DC 20515

Dear Chairman Boehlert:

On behalf of the National Association of Marine Laboratories (NAML), I would like to congratulate you and Chairman Ehlers of the Subcommittee on Environment, Standards, and Technology for your leadership with respect to the *United States Tsunami Warning and Education Act*, H.R. 1674. While tsunamis cannot be prevented or avoided, it is essential that the U.S. be better prepared to face a tsunami through early detection and warning. This can be made possible through an investment in ocean and coastal research, education, technology and infrastructure. NAML believes that this bill is a welcome step in that direction and for that reason; we are pleased to offer our support for this legislation.

NAML understands first hand the devastating effects resulting from insufficient knowledge, technology, or infrastructure for addressing natural disasters such as tsunamis. NAML is a nonprofit organization of over 120 member institutions (list attached) representing coastal, marine, and Great Lakes laboratories stretching from Guam to Bermuda and Alaska to Puerto Rico. Members serve as unique "windows on the sea," providing information on the rich environmental mosaic of coastal habitats as well as offshore oceanic regions and the Great Lakes. NAML is comprised of three regional associations which offer access to local communities at the grass roots level: the Northeastern Association of Marine and Great Lakes Laboratories (NEAMGLL); the Southern Association of Marine Laboratories (SAML); and the Western Association of Marine Laboratories (WAML). Through these unique national and regional networks, NAML supports wise coastal decision-making, local land management and the protection of natural resources, and works together to achieve goals that benefit the environment, the economy, and society through oceanic and Great Lakes research, education and outreach.

In particular, NAML strongly supports provisions within H.R. 1674 that address the increased need for developing new, and modernizing existing, ocean and coastal monitoring systems. Nationally, the need for an integrated ocean, coastal, and Great Lakes observing system is vast, as these systems offer benefits to human and marine health, weather and climate nowcasts and forecasts, homeland security, tourism and coastal business development, and resource management, to name a few.

In the same vein, an integrated network of "tsunami warning centers," found within this legislation, is as important to at-risk coastal communities as an integrated ocean and coastal observing system is to the security of the nation as a whole. In order to prepare for a disaster of the same magnitude as the tsunami that swept across the Indian Ocean in December, continual deep ocean and coastal monitoring is needed. H.R. 1674 addresses this through the creation of a Pacific Tsunami Warning Center and a West Coast and Alaska Tsunami Center.

NAML is pleased that H.R. 1674 addresses tsunami education and outreach activities as well as the importance of Federal, State, Local and international collaboration in ocean science. Not only is a well-trained and knowledgeable workforce necessary in developing effective technologies used to predict and respond to natural disasters like tsunamis, but a greater public understanding of the situation and knowledge of the proper mechanisms for response is key. Our NAML Laboratories are ready and eager to participate in research, education and outreach that is a vital part of your bill and encourage you to also make use of these capabilities within NOAA's Sea Grant College Program.

In closing, NAML would like to thank you for acknowledging the importance of tsunami preparation and education. We appreciate your demonstrated support for ocean, coastal, and Great Lakes marine science. If NAML can provide any additional information, please do not hesitate to contact me or Mr. Joel Widder, who handles NAML government relations, at 202-289-7475.

Sincerely,

Jeffrey M. Reutter

Jeffrey M. Reutter
President
National Association of Marine Laboratories

cc: Honorable Bart Gordon
Honorable Vern Ehlers
Honorable David Wu

XXII: PROCEEDINGS OF THE MARKUP BY THE SUBCOMMITTEE ON ENVIRONMENT, TECHNOLOGY, AND STANDARDS ON H.R. 1674, U.S. TSUNAMI WARNING AND EDUCATION ACT

WEDNESDAY, APRIL 20, 2005

HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON ENVIRONMENT, TECHNOLOGY, AND STANDARDS,
COMMITTEE ON SCIENCE,
Washington, DC.

The Subcommittee met, pursuant to call, at 3:00 p.m., in Room 2318 of the Rayburn House Office Building, Hon. Vernon J. Ehlers [Chairman of the Subcommittee] presiding.

Chairman EHLERS. Good afternoon. The Subcommittee will be in order. Pursuant to notice, the Subcommittee on Environment, Technology, and Standards meets today to consider the following measure, H.R. 1674, *United States Tsunami Warning and Education Act.*

I ask unanimous consent for the authority to recess the Subcommittee at any point, and without objection, it is so ordered. We will now consider the bill, H.R. 1674, and proceed with opening remarks.

On December 26, 2004, one of the most devastating tsunamis ever recorded struck the nations of the Indian Ocean basin. And incidentally, I move that my entire statement be entered in the record, and I will try to skip certain portions of it. As people recovered from the shock of the event, we naturally began to ask questions, such as what can we learn from this to prevent future disasters.

In that vein, I joined Chairman Boehlert, Mr. Wu, and Mr. Inslee, to introduce H.R. 1674. This bill, the *U.S. Tsunami Warning and Education Act,* authorizes $30 million annually for NOAA to expand tsunami forecasts and warning capability for all U.S. coastlines, to increase emphasis on community-based tsunami education and outreach activities, so that the public knows the proper response to tsunami warnings. Third, to maintain a tsunami research program, and fourth, to provide technical advice and training to the international community. The bill is based on the Administration's proposal for a national tsunami warning system, and it incorporates comments from many experts.

Unfortunately, it has taken a tragic event to bring natural disaster response planning to our attention today. However, now that the opportunity is upon us, we must act quickly to establish a tsunami forecast and warning system for the Untied States, and to educate the public to understand and heed the warnings.

This is an excellent bill, produced by Chairman Boehlert, and I urge my colleagues to support this bill and pass it along to the Full Committee.

I also want to add one other comment. All the attention of the tsunami in the Indian Ocean basin has created this interest, but we should be aware that many countries are vulnerable to tsunami damage, and in particular, the United States frequently encounters damage in Alaska and the Hawaiian islands. However, the mainland is also not immune. In March of 1964, when the Great Alaska Earthquake occurred, tsunamis traveled down the West Coast of the United States. The place that got hit the hardest, just because of the direction of the wave, and the topography of the area, and the direction of the opening of the Bay, was Crescent City, California. And in particular, this illustrates the importance of educating people about tsunamis. In particular, they were hit hard because, after the first wave or two hit, they thought well, that is it. Tsunamis are only one or two waves. And they went back to their homes and businesses. The third and the fourth waves were by far the largest, and basically demolished the city, killing a great many people. Though they are now, I would say, the best educated area of the United States. In terms of tsunami warnings, they know precisely how to deal with it. We want to achieve that throughout the world, in any area susceptible to tsunamis.

I am now pleased to recognize Mr. Wu for five minutes to present his opening remarks.

[The prepared statement of Chairman Ehlers follows:]

PREPARED STATEMENT OF CHAIRMAN VERNON J. EHLERS

Good afternoon everyone. Thank you for coming to today's brief Subcommittee markup of H.R. 1674, the *U.S. Tsunami Warning and Education Act.* On December 26, 2004, one of the most devastating tsunamis ever recorded struck the nations of the Indian Ocean Basin. As people recovered from the shock of the event, we naturally began to ask questions such as "What can we learn from this to prevent future disasters?" In that vein, I joined Chairman Boehlert, Mr. Wu, and Mr. Inslee to introduce H.R. 1674.

The *U.S. Tsunami Warning and Education Act* authorizes $30 million annually for the National Oceanic and Atmospheric Administration to:

- expand tsunami forecast and warning capability for all U.S. coastlines;
- increase emphasis on community-based tsunami education and outreach activities so that the public knows the proper response to tsunami warnings;
- maintain a tsunami research program; and
- provide technical advice and training to the international community.

The bill is based on the Administration's proposal for a national tsunami warning system and incorporates comments from many experts, including witnesses at the Science Committee hearing held in January.

Unfortunately, it has taken a tragic event to bring natural disaster response planning to our attention today. However, now that the opportunity is upon us we must act quickly to establish a tsunami forecast and warning system for the United States, and to educate the public to understand and heed the warnings. Chairman Boehlert developed an excellent bill and we do not anticipate any amendments at today's markup. I urge my colleagues to support this bill and pass it along to the Full Committee.

Mr. WU. Thank you, Mr. Chairman, and good afternoon. I thank the Chairman, Chairman Ehlers, and Chairman Boehlert for bringing H.R. 1674 before the Committee and this subcommittee this afternoon, and I am pleased to be an original co-sponsor of this legislation.

While we cannot prevent earthquakes and tsunami, we can prepare for them, and ensure that the citizens of our coastal communities take appropriate action when an event occurs, and well before the event, in preparation for it. Detection and forecasting are not sufficient. States and local communities must be prepared to disseminate the warning, and to direct the public to areas of safety. Individual citizens must know where to go when they receive a warning, or how to proceed if no warning is forthcoming, and they sense, and they undergo a large earthquake near the ocean.

I am fortunate to represent a Congressional district in Oregon with a beautiful coastline. However, we are also well aware of the potential danger presented by the Cascadia fault, a subduction fault line located just off-shore. A 250 mile region of this subduction fault zone is currently locked. It has been locked, we believe, for the last 300 years, or 305 years, and it is not a matter of whether, it is only a matter of when a large earthquake will occur. It may be immediately off the coastline of Oregon and Washington.

Oregon has done a great deal to keep our coastline both beautiful and our citizens safe. Cannon Beach, a coastal community in the First Congressional District of Oregon, was one of the first coastal communities to be designated Tsunami-Ready by NOAA. H.R. 1674 builds upon the successful partnership that exists between Federal, State, and local governments on the West Coast to ensure that all U.S. coastal communities will be prepared to deal with tsunami. The bill authorizes the type of end-to-end system that we must have if we are to avoid the catastrophic loss of life experienced last December in the Indian Ocean nations.

I still have some concerns about the funding levels we are authorizing in this bill. State and local governments have limited resources, and the current funding level in the bill of $6 million per year for tsunami mitigation and education is less than the $7.8 million per year recommended at our Science Committee hearing by Mr. Jay Wilson of Oregon Emergency Management, and I must note that the $7.8 million recommended number was for the Pacific coast, and the $6 million number that we were talking about is not only for the Pacific coast, but it is also for the Caribbean and Atlantic basins. The addition of the Atlantic and Caribbean basins to the warning network will increase the demands on the funds available for inundation mapping, education, and local community mitigation and preparation steps.

I look forward to continuing to work with my colleagues on this bill as it moves forward, to ensure that we provide sufficient resources for education and hazard mitigation. I understand that we have constraints on our total budget, on total expenditures, and understand that there are certain minimum requirements that our physical system needs in order to maintain full capacity. However, I just need to point out, once again, as I have in other settings, that the education and mitigation steps provided for in this bill are

those parts of the bill which will most directly benefit Americans in case of a near-shore earthquake right off our shores. The hardware and the other necessary sensors, if a near-shore earthquake occurs off North America, will certainly be helpful and appropriately so, to people we care about in Japan or elsewhere in the world, but the only thing that can help Americans here, if there is a near-shore earthquake, are mitigation and education steps.

I look forward to working with Chairman Ehlers, Chairman Boehlert, and other co-sponsors, and other Members—co-sponsors of the legislation, and Members of this subcommittee, and the Science Committee, to set forth the best piece of legislation that we possibly can, and I urge support of the existing legislation by all the Members of this panel.

Thank you very much, Mr. Chairman. I yield back the balance of my time.

[The prepared statement of Mr. Wu follows:]

PREPARED STATEMENT OF REPRESENTATIVE DAVID WU

Good afternoon. I thank the Chairman for bringing H.R. 1674 before the Subcommittee this afternoon. I am pleased to be a co-sponsor of this legislation.

We cannot prevent earthquakes and tsunamis, but we can prepare for them and ensure the citizens of our coastal communities take appropriate action when an event occurs. Detection and forecasting are not sufficient. States and local communities must be prepared to disseminate the warning and direct the public to safe areas. Individual citizens must know where to go when they receive a warning.

I am fortunate to represent a district in Oregon with a beautiful coastline. However, we are also well aware of the potential danger presented by the Cascadia fault located just off-shore. Oregon has done a great deal to keep our coastline beautiful and our citizens safe. Cannon Beach, a coastal community in my district, was one of the first coastal communities to be designated Tsunami-Ready by NOAA.

H.R. 1674 builds upon the successful partnership that exists between the Federal, State, and local governments on the west coast to ensure that all U.S. coastal communities will be prepared to deal with tsunamis. The bill authorizes the type of end-to-end system we must have if we are to avoid the catastrophic loss of life experienced last December in the Indian Ocean nations.

I still have some concerns about the funding levels we are authorizing in the bill. State and local governments have limited resources and the current funding level of $6 million per year for tsunami hazard mitigation is less than the $7.8 million per year recommended at our hearing by Mr. Jay Wilson of Oregon Emergency Management.

Addition of the Atlantic and Caribbean basins to the warning network will increase the demands on the funds available for inundation mapping, education and local communication networks. I will continue to work with my colleagues as this bill moves forward to ensure we provide sufficient resources for education and hazard mitigation.

I look forward to working with Chairman Ehlers and the other co-sponsors of this legislation to move this legislation through the Committee. I urge support of the legislation by all my colleagues.

Chairman EHLERS. Without objection, all Members may place opening statements in the record at this point. I hear no objection. So ordered.

I ask unanimous consent that the bill is considered as read and open to amendment at any point. Without objection, so ordered.

Are there any amendments? Hearing none, the question is on the bill, H.R. 1674, *United States Tsunami Warning and Education Act.* All those in favor will say aye. Aye. All those opposed will say no.

In the opinion of the Chair, the ayes have it. I will now recognize Mr. Wu to offer a motion.

Mr. WU. Mr. Chairman, I move that the Subcommittee favorably report the bill, H.R. 1674 to the Full Committee. Further, I ask unanimous consent that the staff be instructed to make all necessary technical and conforming changes to the bill in accordance with the recommendation of the subcommittee.

Chairman EHLERS. The question is on the motion to report the bill favorably. Those in favor of the motion will signify by saying aye. Aye. Opposed, no.

At this, the ayes appear to have it, and the bill is favorably reported. Without objection, the motion to reconsider is laid upon the table.

I have one item of business before we adjourn, and that is to recognize that our esteemed Staff Director for this subcommittee and his wife enjoy the presence of a new baby. Her first name again was? Gabrielle Marie. Born yesterday, after a considerable time of labor, but it was certainly worth the effort. Wonderful baby. And we congratulate Eric and his wife, Natalie, on this wonderful addition to their family. Unfortunately, I think he is still at home recovering from the shock. Yeah, he may be watching the webcast. If so, I hope he heard the applause.

Having no further business to come before this subcommittee, this meeting is adjourned.

[Whereupon, at 3:15 p.m., the Subcommittee was adjourned.]

Appendix:

H.R. 1674, Section-by-Section Analysis

I

109TH CONGRESS
1ST SESSION

H. R. 1674

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

IN THE HOUSE OF REPRESENTATIVES

APRIL 18, 2005

Mr. BOEHLERT (for himself, Mr. INSLEE, Mr. EHLERS, and Mr. WU) introduced the following bill; which was referred to the Committee on Science

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A BILL

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

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 "United States Tsunami Warning and Education Act".

SEC. 2. PURPOSES.

The purposes of this Act are—

1 (1) to improve tsunami detection, forecasting,
2 warnings, notification, preparedness, and mitigation
3 to protect life and property both in the United
4 States and elsewhere in the world;
5 (2) to enhance and modernize the existing Pa-
6 cific Tsunami Warning System to increase coverage,
7 reduce false alarms and increase the accuracy of
8 forecasts and warnings, and to expand detection and
9 warning systems to include other vulnerable States
10 and United States territories, including the Atlantic
11 Ocean, Caribbean Sea, and Gulf of Mexico areas;
12 (3) to improve mapping, modeling, research,
13 and assessment efforts to improve tsunami fore-
14 casting, preparedness, mitigation, response, and re-
15 covery;
16 (4) to improve and increase education and out-
17 reach activities and ensure that those receiving tsu-
18 nami warnings and the at-risk public know what to
19 do when a tsunami is approaching;
20 (5) to provide technical and other assistance to
21 speed international efforts to establish regional tsu-
22 nami warning systems in vulnerable areas worldwide,
23 including the Indian Ocean; and

1 (6) to improve Federal, State, and international
2 coordination for tsunami and other coastal hazard
3 warnings and preparedness.

4 **SEC. 3. TSUNAMI FORECASTING AND WARNING PROGRAM.**

5 (a) IN GENERAL.—The Administrator of the Na-
6 tional Oceanic and Atmospheric Administration, through
7 the National Weather Service, shall operate a program to
8 provide tsunami forecasting and warnings for the Pacific
9 Ocean region and for the Atlantic Ocean, Caribbean Sea,
10 and Gulf of Mexico region.

11 (b) COMPONENTS.—The program under this section
12 shall—

13 (1) include the tsunami warning centers estab-
14 lished under subsection (d);

15 (2) provide tsunami forecasting capability based
16 on models and measurements, including tsunami in-
17 undation models and maps for use in increasing the
18 preparedness of communities, including through the
19 TsunamiReady program;

20 (3) include a cooperative effort among the Na-
21 tional Oceanic and Atmospheric Administration, the
22 United States Geological Survey, and the National
23 Science Foundation under which the Geological Sur-
24 vey and the National Science Foundation shall pro-
25 vide rapid and reliable seismic information to the

1 National Oceanic and Atmospheric Administration
2 from international and domestic seismic networks;
3 (4) provide a capability for the dissemination of
4 warnings to at-risk States and tsunami communities
5 through rapid and reliable notification to govern-
6 ment officials and the public through such means as
7 the National Oceanic and Atmospheric Administra-
8 tion weather radio and the All Hazard Alert Broad-
9 casting Radio; and
10 (5) include any technology the Administrator
11 considers appropriate to fulfill the objectives of the
12 program under this section.
13 (c) SYSTEM AREAS.—The program under this section
14 shall operate—
15 (1) a Pacific tsunami warning system capable
16 of forecasting tsunamis anywhere in the Pacific
17 Ocean region and providing adequate warnings; and
18 (2) an Atlantic Ocean, Caribbean Sea, and Gulf
19 of Mexico tsunami warning system capable of fore-
20 casting tsunamis and providing adequate warnings
21 in areas of the Atlantic Ocean, Caribbean Sea, and
22 Gulf of Mexico that the National Weather Service
23 determines—
24 (A) to be geologically active, or to have sig-
25 nificant potential for geological activity; and

1 (B) to pose significant risks of tsunamis
2 for States along the coastal areas of the Atlan-
3 tic Ocean, Caribbean Sea, or Gulf of Mexico.
4 (d) TSUNAMI WARNING CENTERS.—
5 (1) IN GENERAL.—The Administrator, through
6 the National Weather Service, shall maintain or es-
7 tablish—
8 (A) a Pacific Tsunami Warning Center in
9 Hawaii;
10 (B) a West Coast and Alaska Tsunami
11 Warning Center in Alaska; and
12 (C) any additional forecast and warning
13 centers determined by the National Weather
14 Service to be necessary.
15 (2) RESPONSIBILITIES.—The responsibilities of
16 each tsunami warning center shall include—
17 (A) continuously monitoring data from
18 seismological, deep ocean, and tidal monitoring
19 stations;
20 (B) evaluating earthquakes that have the
21 potential to generate tsunamis;
22 (C) evaluating deep ocean buoy data and
23 tidal monitoring stations for indications of tsu-
24 nami resulting from earthquakes and other
25 sources;

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

(E) coordinating with the tsunami hazard mitigation program described in section 4 to ensure ongoing sharing of information between forecasters and emergency management officials; and

(F) making data gathered under this Act and post-warning analyses conducted by the National Weather Service available to researchers.

(c) TRANSFER OF TECHNOLOGY; MAINTENANCE AND UPGRADES.—

(1) IN GENERAL.—In carrying out this section, the National Weather Service shall—

(A) develop requirements for the equipment used to forecast tsunamis, which shall include provisions for multipurpose detection platforms, reliability and performance metrics, and to the maximum extent practicable how the equipment will be integrated 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; and

(B) develop and execute a plan for the transfer of technology from ongoing research described in section 5 into the program under this section.

(2) REPORT TO CONGRESS.—(A) Not later than 1 year after the date of enactment of this Act, the National Weather Service shall transmit to Congress a report on how the tsunami forecast system under this section will be integrated 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.

(B) Not later than 3 years after the date of enactment to this Act, the National Weather Service shall transmit a report to Congress on how technology developed under section 5 is being transferred into the program under this section.

(f) CONGRESSIONAL NOTIFICATIONS.—The Administrator shall notify the Senate Committee on Commerce, Science, and Transportation and the House of Representatives Committee on Science within 3 months of—

1 (1) impaired regional forecasting capabilities
2 due to equipment or system failures; and
3 (2) significant contractor failures or delays in
4 completing work associated with the tsunami fore-
5 casting and warning system.
6 (g) EXTERNAL REVIEW.—The Administrator of the
7 National Oceanic and Atmospheric Administration shall
8 enter into an arrangement with the National Academy of
9 Sciences to review the tsunami detection, forecast, and
10 warning program operated by the National Weather Serv-
11 ice under this Act to assess further modernization and cov-
12 erage needs, as well as long-term operational reliability
13 issues, taking into account measures implemented under
14 this Act. The review shall also include an assessment of
15 how well the forecast equipment has been integrated into
16 other United States and global ocean and coastal observa-
17 tion systems and the global earth observing system of sys-
18 tems. Not later than 2 years after the date of enactment
19 of this Act, the Administrator shall transmit a report con-
20 taining the National Academy of Sciences' recommenda-
21 tions, the Administrator's responses to the recommenda-
22 tions, including those where the Administrator disagrees
23 with the Academy, a timetable to implement the accepted
24 recommendations, and the cost of implementing all the
25 Academy's recommendations, to the Senate Committee on

1 Commerce, Science, and Transportation and the House of
2 Representatives Committee on Science.

3 **SEC. 4. TSUNAMI HAZARD MITIGATION PROGRAM.**

4 (a) IN GENERAL.—The Administrator of the Na-
5 tional Oceanic and Atmospheric Administration, through
6 the National Weather Service, shall conduct a community-
7 based tsunami hazard mitigation program to improve tsu-
8 nami preparedness of at-risk areas in the United States
9 and its territories.

10 (b) COORDINATING COMMITTEE.—In conducting the
11 program under this section, the Administrator shall estab-
12 lish a coordinating committee comprising representatives
13 of Federal, State, local, and tribal government officials.
14 The committee shall—

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

18 (2) ensure that areas described in section 3(c)
19 in the United States and its territories can have the
20 opportunity to participate in the program; and

21 (3) provide recommendations to the National
22 Weather Service on how to improve the
23 TsunamiReady program, particularly on ways to
24 make communities more tsunami resilient through

1 the use of inundation maps and other mitigation
2 practices.
3 (c) PROGRAM COMPONENTS.—The program under
4 this section shall—
5 (1) use National Oceanic and Atmospheric Ad-
6 ministration inundation models to improve the qual-
7 ity and extent of inundation mapping, including as-
8 sessment of vulnerable inner coastal areas;
9 (2) promote and improve community outreach
10 and education networks and programs to ensure
11 community readiness, including the development of
12 multi-hazard risk and vulnerability assessment train-
13 ing and decision support tools, implementation of
14 technical training and public education programs,
15 and provide for certification of prepared commu-
16 nities;
17 (3) integrate tsunami preparedness and mitiga-
18 tion programs into ongoing hazard warning and risk
19 management programs in affected areas;
20 (4) promote the adoption of tsunami warning
21 and mitigation measures by Federal, State, tribal,
22 and local governments and nongovernmental entities,
23 including educational programs to discourage devel-
24 opment in high-risk areas; and

1 (5) provide for periodic external review of the
2 program.

3 **SEC. 5. TSUNAMI RESEARCH PROGRAM.**

4 The Administrator of the National Oceanic and At-
5 mospheric Administration shall, in consultation with other
6 agencies and academic institutions, establish or maintain
7 a tsunami research program to develop detection, forecast,
8 communication, and mitigation science and technology, in-
9 cluding advanced sensing techniques, information and
10 communication technology, data collection, analysis, and
11 assessment for tsunami tracking and numerical forecast
12 modeling. Such research program shall—

13 (1) consider other appropriate research to miti-
14 gate the impact of tsunamis;

15 (2) coordinate with the National Weather Serv-
16 ice on technology to be transferred to operations;
17 and

18 (3) ensure that research and findings are avail-
19 able to the scientific community.

20 **SEC. 6. GLOBAL TSUNAMI WARNING AND MITIGATION NET-**
21 **WORK.**

22 (a) INTERNATIONAL TSUNAMI WARNING SYSTEM.—
23 The Administrator of the National Oceanic and Atmos-
24 pheric Administration, through the National Weather
25 Service, in coordination with other members of the United

1 States Interagency Committee of the National Tsunami
2 Mitigation Program, shall provide technical assistance and
3 training to the Intergovernmental Oceanographic Commis-
4 sion, the World Meteorological Organization, and other
5 international entities, as part of international efforts to
6 develop a fully functional global tsunami forecast and
7 warning system comprising regional tsunami warning net-
8 works, modeled on the International Tsunami Warning
9 System of the Pacific.

10 (b) INTERNATIONAL TSUNAMI INFORMATION CEN-
11 TER.—The Administrator of the National Oceanic and At-
12 mospheric Administration, through the National Weather
13 Service, shall operate an International Tsunami Informa-
14 tion Center to improve tsunami preparedness for all Pa-
15 cific Ocean nations participating in the International Tsu-
16 nami Warning System of the Pacific, and which may also
17 provide such assistance to other nations participating in
18 a global tsunami warning system established through the
19 Intergovernmental Oceanographic Commission. As part of
20 its responsibilities around the world, the Center shall—

21 (1) monitor international tsunami warning ac-
22 tivities around the world;

23 (2) assist member states in establishing na-
24 tional warning systems, and make information avail-

able 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) DETECTION EQUIPMENT; TECHNICAL ADVICE AND TRAINING.—In carrying out this section, the National Weather Service—

(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.

(d) DATA-SHARING REQUIREMENT.—The National Weather Service may not provide assistance under this section for any nation unless that nation agrees to share relevant data or products associated with the development

1 and operation of the tsunami warning network in that re-
2 gion.

3 **SEC. 7. AUTHORIZATION OF APPROPRIATIONS.**

4 There are authorized to be appropriated to the Ad-
5 ministrator of the National Oceanic and Atmospheric Ad-
6 ministration $30,000,000 for each of fiscal years 2006
7 through 2008 to carry out this Act. Of the amounts appro-
8 priated for any fiscal year authorized under this Act—

9 (1) 70 percent shall be for the tsunami forecast
10 and warning systems under section 3 and inter-
11 national activities under section 6;

12 (2) 20 percent shall be for the tsunami hazard
13 mitigation program under section 4; and

14 (3) 10 percent shall be for the tsunami research
15 program under section 5.

○

SECTION-BY-SECTION ANALYSIS OF H.R. 1674,
UNITED STATES TSUNAMI WARNING AND EDUCATION ACT

Section 1. Short Title.

United States Tsunami Warning and Education Act

Section 2. Purposes.

Describes the purposes of the Act: (1) to improve tsunami detection, forecasting, warnings, notification, preparedness and mitigation both in the U.S. and around the world; (2) to enhance and modernize the existing Pacific tsunami warning system and to expand detection and warning systems to the Atlantic Ocean, Caribbean Sea and Gulf of Mexico; (3) to improve tsunami mapping, modeling, research and assessment efforts; (4) to improve and increase education and outreach activities; (5) to provide technical and other assistance to international efforts to establish regional tsunami warning systems in vulnerable areas worldwide, including the Indian Ocean region; and (6) to improve federal, State, and international coordination for tsunami and other coastal hazard warnings and preparedness.

Section 3. Tsunami Forecasting and Warning Program.

Requires NOAA to operate a program to provide tsunami forecasting and warnings for the Pacific Ocean region, and for the Atlantic Ocean, Caribbean Sea and Gulf of Mexico regions.

The components of the program shall include: tsunami warning centers; forecasting capabilities, based on measurements, models and maps; a cooperative effort among NOAA, USGS, and NSF to provide seismic information; and the capability for the rapid and reliable dissemination of tsunami warnings to States and communities.

Directs the National Weather Service to develop requirements for the equipment used to forecast tsunamis, including how the equipment will be integrated into other United States and global environmental observing systems and a plan for the transfer of technology from research into operations. Requires the National Weather Service to submit reports to Congress on how it will integrate the equipment and on the technology transfer plan. Also requires the National Weather Service to notify Congress when tsunami forecasting capabilities are impaired for more than three months due to equipment or contractor problems.

Requires the Administrator to enter into an arrangement with the National Academy of Sciences to evaluate and provide recommendation on how to improve NOAA's tsunami detection, forecast and warning activities.

Section 4. Tsunami Hazard Mitigation Program.

Directs the National Weather Service to conduct a community-based tsunami hazard mitigation program to improve tsunami preparedness of at-risk areas. Establishes a coordinating committee of federal and State officials, which shall: develop a plan for ensuring wide participation in the program; determine how funds will be allocated; and provide recommendations to increase resiliency of vulnerable communities. Specifically, the program will: use NOAA models and maps to assess vulnerable areas; promote and improve community outreach and education networks; and integrate tsunami preparedness and mitigation programs into ongoing hazard warnings and planning.

Section 5. Tsunami Research Program.

Requires NOAA to establish a tsunami research program to develop detection, forecasting, communication and mitigation tools and technologies. Directs the program to work with the National Weather Service on ways to transfer the research into operations.

Section 6. Global Tsunami Warning and Mitigation Network.

Directs NOAA to provide technical assistance and training to the international community toward the development of a fully functional global tsunami forecast and warning system. Establishes the International Tsunami Information Center to provide information and advice to nations around the world to improve tsunami preparedness.

Section 7. Authorization of Appropriations.

Provides $30 million for each of fiscal years 2006–2008 to carry out the act. Specifies that of any funds appropriated for activities under this act, 70 percent should be used for the tsunami forecast and warning systems under section three and section six, 20 percent should be used for the tsunami hazard mitigation program

under section four, and 10 percent should be for the tsunami research program under section five.

XXIII: PROCEEDINGS OF THE FULL COMMITTEE MARKUP ON H.R. 1674, UNITED STATES TSUNAMI WARNING AND EDUCATION ACT

WEDNESDAY, MAY 4, 2005

HOUSE OF REPRESENTATIVES,
COMMITTEE ON SCIENCE,
Washington, DC.

The Committee met, pursuant to call, at 10:17 a.m., in Room 2318 of the Rayburn House Office Building, Hon. Sherwood L. Boehlert [Chairman of the Committee] presiding.

Chairman BOEHLERT. Good morning. The Committee on Science will come to order.

Pursuant to notice, the Committee on Science meets to consider the following measures: H.R. 921, *Minority Serving Institution Digital and Wireless Technology Opportunity Act of 2005;* H.R. 1674, *U.S. Tsunami Warning and Education Act;* and H.R. 250, *Manufacturing Technology Competitiveness Act of 2005.* I ask unanimous consent for the authority to recess the Committee at any point during consideration of these matters. And without objection, that is so ordered.

We will now proceed with the markup, beginning with opening statements, and I will launch it.

I want to welcome everyone to this important markup. As usual, we have before us bills that represent bipartisan efforts to come up with practical solutions to real problems. These bills will advance education, protect our Nation and others from natural disasters, enhance research and environmental protection, and strengthen our economy. Not bad for one morning's work.

And I would add that while we are marking up these bills, we are also working behind the scenes on our portions of the Homeland Security reauthorization bill that was reported out of the Homeland Committee last week.

Let me talk briefly now about each of the bills before us to save time later.

First up is Mr. Forbes' bill to help minority serving institutions get the information technology equipment they need. This bill is identical to the version this committee approved last year, and the bill must also go through the Education and Workforce Committee. To move the bill forward swiftly, both sides of the aisle here have agreed to simply move the bill this morning by unanimous consent.

I think the bill will provide needed assistance to educational institutions that are essential to our efforts to develop more scientists

and engineers from under-represented groups. And I think our version of the bill, which places the program in the Department of Commerce rather than the National Science Foundation, matches the program with the appropriate agency for carrying it out.

Our second bill will be the one I have introduced with Representative Inslee to ensure that the Nation and the world are better prepared to detect and respond to tsunamis. We all watched with horror last December as the Indian Ocean tsunami wreaked its devastation. Much of the death that occurred could have been avoided.

We have an obligation to learn more about tsunamis through research, to improve our ability to detect tsunamis and issue warnings about them, and to improve tsunami preparation and education so that we can limit damage and know what to do when the warnings come. This bill will improve research, detection, and education, and significantly, sets aside a proportion of appropriated funds for each of these essential activities.

The basis of this bill was the Administration's plan. The Administration is to be congratulated for its swift, thoughtful, and comprehensive response to last December's events. We then built on the Administration's proposal, following the guidance we received during our January hearing. As a result, the bill stresses and ensures funding for tsunami preparation and education. And we also press for tsunami detection to be integrated as much as possible with other earth- and ocean-observing systems.

Finally, we will take up Dr. Ehlers' manufacturing bill, which the House passed last year. I know that, as was the case last year, we will have some debate over adding to the bill ideas that may be worthy in themselves, the proposals, but that would guarantee the demise of the bill. That is something we don't want to do. I will oppose most of these amendments, which include authorizing—I don't say all of them, because I haven't seen all of them. I will oppose most of the amendments, which include authorizing the Advanced Technology Program, a program that I have always supported and continue to support. But I want to make—actually, I want to make progress on the bill in connection with manufacturing. That is especially important as we enter the budget season with appropriations likely to be more constrained than ever.

And let me say at the outset that I don't want the amendment debate to obscure the broad, bipartisan support for the base bill, which the House passed last year by voice vote, no mean achievement given the political debate surrounding manufacturing last year.

We were going to also do a markup—during the markup this morning of the NOAA authorization bill, but both we and the Democrats have brought up significant additional changes to the bill. We need some more time to talk those through. We will reschedule the markup of the NOAA bill swiftly, and I would hope we could do it as early as next week.

So let me close by thanking my colleagues on both sides of the aisle for their contributions to these bills. As usual, we have beaten the odds and have worked out sensible, targeted, bipartisan measures.

Mr. Gordon.

[The prepared statement of Chairman Boehlert follows:]

PREPARED STATEMENT OF CHAIRMAN SHERWOOD L. BOEHLERT

I want to welcome everyone to this important markup. As usual, we have before us bills that represent bipartisan efforts to come up with practical solutions to real problems. These bills will advance education, protect our nation and others from natural disasters, enhance research and environmental protection and strengthen our economy. Not bad for one morning's work.

And I would add that while we are marking up these bills, we are also working behind the scenes on our portions of the Homeland Security reauthorization bill that was reported out of the Homeland Committee last week.

Let me talk briefly now about each of the bills before us today to save time later.

First up is Mr. Forbes' bill to help minority serving institutions get the information technology equipment they need. This bill is identical to the version this committee approved last year, and the bill must also go through the Education and Workforce Committee. To move the bill forward swiftly, both sides of the aisle here have agreed to simply move the bill this morning by unanimous consent.

I think the bill will provide needed assistance to educational institutions that are essential to our efforts to develop more scientists and engineers from under-represented groups. And I think our version of the bill, which places this program in the Department of Commerce rather than in the National Science Foundation, matches the program with the appropriate agency for carrying it out.

Our second bill will be the bill I've introduced with Representative Inslee to ensure that the Nation and the world are better prepared to detect and respond to tsunamis. We all watched with horror last December as the Indian Ocean tsunami wreaked its devastation. Much of the death could have been avoided.

We have an obligation to learn more about tsunamis through research, to improve our ability to detect tsunamis and issue warnings about them, and to improve tsunami preparation and education so that we can limit damage and know what to do when the warnings come. This bill will improve research, detection and education and, significantly, sets aside a proportion of appropriated funds for each of those essential activities.

The basis of this bill was the Administration's plan. The Administration is to be congratulated for its swift, thoughtful and comprehensive response to last December's events. We then built on the Administration proposal, following the guidance we received in our January hearing. As a result, the bill stresses and ensures funding for tsunami preparation and education, and we also press for tsunami detection to be integrated, as much as possible, with other Earth- and ocean-observing systems.

Finally, we will take up Dr. Ehlers' manufacturing bill, which the House passed last year. I know that, as was the case last year, we will have some debate over adding to the bill ideas that may be worthy in themselves, but that would guarantee the demise of this bill. I will oppose those amendments, which include authorizing the Advanced Technology Program, a program I have always supported and continue to support. But I want to actually make progress on manufacturing. That's especially important as we enter the budget season with appropriations likely to be more constrained than ever.

And let me say at the outset that I don't want the amendment debate to obscure the broad, bipartisan support for the base bill, which the House passed last year by voice vote—no mean achievement given the political debate surrounding manufacturing last year.

We were going to also mark up the NOAA organic act this morning, but both we and the Democrats have brought up significant additional changes to the bill. We need some more time to talk those through. We will reschedule the markup of the NOAA bill swiftly—perhaps as early as next week.

So let me close by thanking my colleagues on both sides of the aisle for their contributions to these bills. As usual, we've beaten the odds and have worked out sensible, targeted, bipartisan measures.

Mr. Gordon.

Mr. GORDON. Thank you, Mr. Chairman.

Let me first thank you for moving NOAA to a later date so that we can have a chance—I am sure that this is something that we can work out. And there is, I think, general agreement on both the minority and the majority on this bill.

We are also pleased that the Committee is moving forward on its legislative agenda, and we look forward to continuing to work on

a bipartisan basis on several major bills that we hope will be before the Committee shortly.

Today, we are addressing three important legislative areas. We applaud the choice of topics and only question why the Committee has not chosen to legislate more aggressively in certain of these areas, especially manufacturing. We support H.R. 921, the *Minority Serving Institution Digital and Wireless Technological Opportunity Act.* The bill would provide grants to minority serving institutions for information technology upgrades and for training faculty and staff to use the technology effectively in support of their education and research activities. Minority serving institutions prepare a growing portion of the future science and technology workforce of the Nation, and it is important that these colleges and universities be able to provide a quality education for their students.

H.R. 250, the *Manufacturing Technology Competitiveness Act,* is a start, but we need to make the bill's content live up to its title. Democratic Members of the Committee, once again, will be offering amendments to the MEP funding, workforce training, and technology innovation that would make the bill much stronger. Even if these pass, we will only have taken the first steps on one of the biggest problems of our day, and we hope we will have other opportunities this Congress to deal with the other aspects of this far-reaching problem.

We are especially pleased that the Committee, in a bipartisan fashion, has so rapidly developed H.R. 1674, the *United States Tsunami Warning and Education Act.* The bill directs NOAA to expand the current tsunami warning system on two basins so that all U.S. coastal areas and territories will be covered by a buoy-based detection and warning system. The bill also directs NOAA to conduct a community-based tsunami hazard mitigation program to ensure coastal communities are prepared to act upon any warning issued by the tsunami warning centers and establish a tsunami research program. We enthusiastically support the bill. We feel that the funding levels for hazard mitigation and education programs are too low. Mr. Wu's amendment would correct this problem.

Thank you, Mr. Chairman.

[The prepared statement of Mr. Gordon follows:]

PREPARED STATEMENT OF REPRESENTATIVE BART GORDON

We are pleased that the Committee is moving forward on its legislative agenda and we look forward to continuing to work on a bipartisan basis on several major bills that we hope will be before the Committee shortly.

Today we are addressing four important legislative areas. We applaud the choice of topics and only question why the Committee has not chosen to legislate more aggressively in certain of these areas, especially manufacturing.

We support H.R. 921, the *Minority Serving Institution Digital and Wireless Technology Opportunity Act.* The bill would provide grants to minority serving institutions for information technology upgrades and for training faculty and staff to use the technology effectively in support of their education and research activities. Minority serving institutions prepare a growing portion of the future science and technology workforce of the Nation, and it is important that these colleges and universities be able to provide a quality education for their students.

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our day and we hope we will have other opportunities this Congress to deal with other aspects of this far-reaching problem.

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Chairman BOEHLERT. Thank you.

Without objection, Members may place opening statements in the record at this point.

[The prepared statement of Mr. Ehlers follows:]

PREPARED STATEMENT OF REPRESENTATIVE VERNON J. EHLERS

On December 26, 2004, one of the most devastating tsunamis ever recorded struck the nations of the Indian Ocean Basin. As people recovered from the shock of the event, we naturally began to ask questions such as, "What can we learn from this to prevent future disasters?" In that vein, I joined Chairman Boehlert, Mr. Wu, and Mr. Inslee to introduce the *U.S. Tsunami Warning and Education Act.*

H.R. 1674 authorizes $30 million annually for the National Oceanic and Atmospheric Administration to:

- expand tsunami forecast and warning capability for all U.S. coastlines;
- increase emphasis on community-based tsunami education and outreach activities so that the public knows the proper response to tsunami warnings;
- maintain a tsunami research program; and
- provide technical advice and training to the international community.

The bill is based on the Administration's proposal for a national tsunami warning system and incorporates comments from many experts, including witnesses at the Science Committee hearing held in January.

Unfortunately, it has taken a tragic event to bring natural disaster response planning to our attention today. However, now that the opportunity is upon us we must act quickly to establish a tsunami forecast and warning system for the United States, aid other countries in doing the same, and educate the public to understand and heed the warnings. Chairman Boehlert developed an excellent bill that moved quickly through the Subcommittee. I urge my colleagues to support this bill and pass it from the Full Committee.

[The prepared statement of Ms. Hooley follows:]

PREPARED STATEMENT OF REPRESENTATIVE DARLENE HOOLEY

Thank you Mr. Chairman. I am pleased that we are addressing the issue of tsunami and how we can better prepare ourselves for these natural disasters. I appreciate the Chairman's willingness to bring this issue up before the Committee and I hope that we are able to produce something that will benefit coastal communities across the Nation.

The tsunami that struck Southeast Asia last December awoke us all to the destructive force that oceans can produce. The undersea earthquake that sent a massive wall of water crashing ashore across thousands of miles of coastline in the Indian Ocean could have happened just off the coast of Oregon, Washington, California, Alaska, or Hawaii and it could have been our coastal communities mourning their dead and dealing with the lasting destruction.

While I am pleased with many aspects of this bill, I am especially pleased with the funding that has been earmarked for Tsunami Hazard Mitigation Programs across the country. I applaud the Chairman's decision to include an increase in the funding for these programs from $6 million to $7.8 million as part of his Manager's Amendment. This January I wrote a letter signed by many of my Pacific Coast colleagues to the Appropriations Committee asking them to appropriate $7.8 million for Tsunami Hazard Mitigation Programs. I am pleased that this legislation recommends this same level of funding and I hope that the Appropriations Committee

follows the recommendations of experts and the requests made by their colleagues to provide the necessary funding.

I am also happy to see money set aside in this legislation for continued research on tsunami so that we can better understand and predict their behavior, hopefully limiting the cost to life and property that these natural disasters cause. Researchers at Oregon State University and across the region are already making valuable contributions to our understanding of tsunami and it is important that we continue to encourage their work.

The tsunami last winter demonstrated the destructive potential of tsunami. It is my hope that this legislation is the first step in limiting the damage that could be done in the United States.

[The prepared statement of Ms. Jackson-Lee follows:]

PREPARED STATEMENT OF REPRESENTATIVE SHEILA JACKSON-LEE

Mr. Chairman, I want to applaud you and my fellow colleagues Rep. Inslee, Rep. Ehlers, and Rep. Wu for authoring the *U.S. Tsunami Warning and Education Act.* Truly, this is a timely piece of legislation that should protect our nation from a tsunami disaster that could produce monumental damage.

This legislation comes after the tragic tsunami disaster that took place in South Asia. I had the opportunity to travel to Sri Lanka shortly after the tsunami disaster to survey the damage that had taken place. Suffice to say that the amount of damage caused by this natural disaster is beyond our complete comprehension. People lost loved ones, in many cases losing their entire family, they lost their homes and businesses, and truly everyone affected by the tsunami disaster will have the mental trauma of that day for the rest of their lives.

This bill directs NOAA to expand the current tsunami warning system to cover the Pacific, Atlantic and Caribbean basins so that all U.S. coastal areas and territories will be covered by a buoy-based detection and warning system. It is vital that the American people have peace of mind that we can at least warn them of an impending disaster. There will be those who claim that the chances of another tsunami disaster taking place are one in a million, but after seeing the effects of the tsunami disaster in South Asia, I think even those odds are too great for us to ignore.

This bill also establishes a tsunami research program and authorizes NOAA to participate in the International Tsunami Warning System and to provide technical assistance through international organizations as part of the international effort to develop and operate a global tsunami warning network. This legislation also requires NOAA to operate an International Tsunami Information Center to improve tsunami preparedness for all Pacific Ocean nations participating in the international Pacific network. It is vital that we aid our brothers and sisters abroad and try to protect them from such natural disasters.

This legislation is vital both for our security and that of the global community at large. Again, I applaud my colleagues for authoring this timely piece of legislation, which I hope will pass through the House without contention. While we could not prevent the South Asian tsunami disaster, we can work to prevent such future disaster from having such a devastating impact. This legislation works toward that goal and it is in that vein that I support it.

Thank you.

Chairman BOEHLERT. We will now consider H.R. 1674, *U.S. Tsunami Warning and Education Act.*

I provided my thoughts on the bill in the opening remarks. Just let me say that the bill will save lives and property, and those are two objectives that we strongly support. It will have a real impact that hopefully we won't see for a long time, because we hope the world won't have to face another tsunami any time soon. But we can't know that. That is the point. So I urge passage of this bill, which will prove essential when we most need it.

Mr. Gordon.

[The prepared statement of Chairman Boehlert follows:]

PREPARED STATEMENT OF CHAIRMAN SHERWOOD BOEHLERT

Tsunami bill

I provided my thoughts on this bill in my opening remarks. Let me just say that this bill will save lives and property. It will have a real impact that hopefully we won't see for a long time because we hope the world won't have to face another tsunami any time soon. But we can't know that—and that's the point. So I urge passage of this bill which will prove essential when we most need it.

Tsunami amendment

This is largely a technical amendment. The most significant change in it is that it provides additional funds for preparation, education and outreach by altering the proportion of the funding that will go to that purpose. This change is a result of negotiations with our friends on the other side of the aisle. I think the amendment makes this an even more balanced bill. I urge its adoption.

Mr. GORDON. Mr. Chairman, following your lead, I made a statement concerning this in my opening statement. And let me just—so I will quickly give a synopsis by saying this is important legislation. I think that there are some funding problems that need to be addressed to make it really effective, but this is a swift action on an important problem. And I thank you for bringing it up.

[The prepared statement of Mr. Gordon follows:]

PREPARED STATEMENT OF REPRESENTATIVE BART GORDON

Mr. Chairman, thank you for bringing the Tsunami Warning and Education Act before the Committee this morning.

This legislation authorizes a comprehensive set of NOAA activities to ensure we have a warning and detection system operated at the federal level and a hazard mitigation and education system in place at the State and local level.

The bill also authorizes funding for research to improve our knowledge of tsunamis, to develop improved detection and warning technologies and to develop effective education and outreach tools.

However, passing this authorization bill is only the beginning.

Fortunately, catastrophic tsunamis are rare events. But it is exactly this characteristic that can lead us to neglect this system once it is installed and the memory of this past catastrophic event in Indonesia fades.

If we are going to maintain the safety of our coastline, we need to maintain the detection and warning system we are authorizing today. We need to maintain State and local education, outreach, and emergency preparedness programs so that all citizens are prepared to respond if an event occurs.

Maintenance of a fully functioning program requires ongoing oversight and support by the Congress and the Administration. This will remain a significant challenge in these times of tight budgets.

I thank the Chairman and my colleagues, Rep. Wu, Rep. Hooley, and Rep. Baird for their work on this issue and I encourage all of my colleagues to support this legislation.

Chairman BOEHLERT. I ask unanimous consent that the bill is considered as read and open to amendment at any point and that Members proceed with the amendments in the order of the roster.

Without objection, so ordered.

The first amendment on the roster is a manager's amendment offered by the Chair.

This is largely a technical amendment. It has been cleared with the minority. The most significant change in it is that it provides additional funds for preparation, education, and outreach by altering the proportion of funding that will go to that purpose. This change is the result of negotiations with our friends and colleagues on the other side of the aisle. I think the amendment makes this an even more balanced bill, and I thank the minority for their contribution, and I urge its adoption.

Mr. Gordon.

Mr. GORDON. Thank you, Mr. Chairman.

Chairman BOEHLERT. I have got—I am told—I have an amendment at the desk, and the Clerk will report the amendment.

Ms. TESSIERI. Amendment to H.R. 1674 offered by Mr. Boehlert of New York.

Chairman BOEHLERT. Thank you. I ask unanimous consent to dispense with the reading and that the amendment is considered as en bloc. Without objection—or Mr. Gordon.

Mr. GORDON. Mr. Chairman, I move to strike the last word.

Chairman BOEHLERT. You are recognized for five minutes.

Mr. GORDON. Mr. Chairman, I want to thank you for working with us on this amendment. The amendment incorporates amendments offered by our colleagues, Mr. Wu, Representative Hooley, and Representative Baird, to address a number of issues raised by the Pacific Coastal States. We want to continue to work with you on this bill as it moves forward, and I urge my colleagues to support the amendment to the legislation.

Mr. WU. Mr. Chairman, I move to strike the last word.

Chairman BOEHLERT. The gentleman is recognized.

Mr. WU. I want to thank the staff on both sides, the Chairman, and the Ranking Member for working on a good, bipartisan tsunami warning and education bill. And I want to thank everyone on the Committee and also the staff for increasing that component of the bill, which will truly benefit Americans, and that is the education and mitigation part of the bill. The other parts of the bill are very, very important, but if we have a near-shore event, near-shore earthquake, the only part of the bill that will truly benefit Americans is the $7.8 million which is being spent on education and mitigation, and I want to express my appreciation to the Chairman for working with us to increase this amount from $1 million to $7.8 million. I wish that we could increase that amount even further, but even the most optimistic of us have to bow to some realities, some very harsh realities, in the current fiscal environment. And I also want to recognize the very hard work of my colleagues, Mr. Baird, and Ms. Hooley, also from the Pacific Northwest.

And again, I want to thank the Chairman, the Ranking Member, and the Committee staff on both sides for working to improve this bill.

And I yield back.

Chairman BOEHLERT. Thank you very much.

And I wish to acknowledge—the Chair wishes to acknowledge your significant contribution to the overall quality and quantity of the final bill.

Is there any further discussion on the amendment? If no, the vote occurs on the amendment. All in favor, say aye. Opposed, no. The ayes have it, and the amendment is agreed to.

Now Mr. Wu, do you have an amendment you would like to offer at this point? Was that incorporated into the manager's amendment?

Mr. WU. Mr. Chairman, I do have an amendment, which is not in the manager's amendment, and——

Chairman BOEHLERT. Okay. The Clerk will report the amendment.

Ms. TESSIERI. Amendment to H.R. 1674 offered by Mr. Wu of Oregon.

Chairman BOEHLERT. I ask unanimous consent to dispense with the reading. Without objection, so ordered.

The gentleman is recognized for five minutes.

Mr. WU. Thank you, Mr. Chairman.

My amendment would require the Administrator to make an assessment of the potential for expanded communications options to improve systems for tsunami and other hazard warning systems. Oregon has been evaluating new communication systems to ensure that coastal communities receive warnings, advisories, and alerts issued by NOAA along with information on evacuation plans through multiple communication devices, which are also redundant and secure.

A company in my District has begun providing this service to several coastal communities, and there are several consortia working on this. I understand this amendment may cause some jurisdictional issues for this committee, and I want to offer to work with the Chairman to—if the Chairman will work with me on some report language to address the need to evaluate a general communication systems and needs and secure systems for doing so.

Chairman BOEHLERT. You have that commitment from the Chair, Mr. Wu.

Mr. WU. I ask unanimous consent to withdraw the amendment.

Chairman BOEHLERT. Without objection, so ordered.

Are there any other amendments? Hearing none, the vote is on the bill H.R. 1674, *U.S. Tsunami Warning and Education Act,* as amendment. All in favor, say aye. Opposed, no. In the opinion of the Chair, the ayes have it.

I recognize Mr. Gordon to offer a motion.

Mr. GORDON. Mr. Chairman, I move that the Committee favorably report H.R. 1674, as amended, to the House with the recommendation that the bill, as amended, do pass. Furthermore, I move that the staff be instructed to prepare the legislative report and make necessary technical and conforming changes, and that the Chairman take all necessary steps to bring the bill before the House for consideration.

Chairman BOEHLERT. The question is on the motion to report the bill favorably. Those in favor of the motion will signify by saying aye. Opposed, no. The ayes have it, and the bill is favorably reported.

Without objection, the motion to reconsider is laid upon the table. I move that Members have two subsequent calendar days in which to submit supplemental, minority, or additional views on the measure. I move pursuant to Clause 1 of Rule 22 of the Rules of the House of Representatives that the Committee authorizes the Chairman to offer such motions as may be necessary in the House to adopt and pass H.R. 1674, *U.S. Tsunami Warning and Education Act,* as amended. Without objection, so ordered.

I want to thank the Members for their attendance and for their continued active participation in the deliberations of this committee.

We are adjourned.

[Whereupon, at 11:31 a.m., the Committee was adjourned.]

Appendix:

SUBCOMMITTEE ON ENVIRONMENT, TECHNOLOGY, AND STANDARDS MARKUP MEMORANDUM ON H.R. 1674, H.R. 1674 AS REPORTED BY THE SUBCOMMITTEE, SECTION-BY-SECTION ANALYSIS, AMENDMENT ROSTER

COMMITTEE ON SCIENCE
U.S. HOUSE OF REPRESENTATIVES
WASHINGTON, DC 20515

April 20, 2005

MEMORANDUM

TO: Sherwood L. Boehlert, Chairman

FROM: Vernon J. Ehlers, Chairman
Subcommittee on Environment, Technology and Standards

SUBJECT: Subcommittee Markup of H.R. 1674, United States Tsunami Warning and Education Act.

On April 20, 2005, the Subcommittee on Environment, Technology, and Standards considered H.R. 1674, United States Tsunami Warning and Education Act, and ordered the measure reported, without amendment, by a voice vote.

Attached is a copy of the measure as reported by the subcommittee, as well as a section-by-section analysis.

I look forward to working with you to bring this bill before the Committee for consideration.

Attachments (2)

.....
(Original Signature of Member)

109TH CONGRESS
1ST SESSION

H. R. 1674

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

IN THE HOUSE OF REPRESENTATIVES

Mr. BOEHLERT (for himself and Mr. INSLEE) introduced the following bill; which was referred to the Committee on _____

A BILL

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

1 *Be it enacted by the Senate and House of Representa-*
2 *tives of the United States of America in Congress assembled,*

3 **SECTION 1. SHORT TITLE.**

4 This Act may be cited as the "United States Tsunami
5 Warning and Education Act".

1 **SEC. 2. PURPOSES.**

2 The purposes of this Act are—

3 (1) to improve tsunami detection, forecasting,
4 warnings, notification, preparedness, and mitigation
5 to protect life and property both in the United
6 States and elsewhere in the world;

7 (2) to enhance and modernize the existing Pa-
8 cific Tsunami Warning System to increase coverage,
9 reduce false alarms and increase the accuracy of
10 forecasts and warnings, and to expand detection and
11 warning systems to include other vulnerable States
12 and United States territories, including the Atlantic
13 Ocean, Caribbean Sea, and Gulf of Mexico areas;

14 (3) to improve mapping, modeling, research,
15 and assessment efforts to improve tsunami fore-
16 casting, preparedness, mitigation, response, and re-
17 covery;

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

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

1 (6) to improve Federal, State, and international
2 coordination for tsunami and other coastal hazard
3 warnings and preparedness.

4 **SEC. 3. TSUNAMI FORECASTING AND WARNING PROGRAM.**

5 (a) IN GENERAL.—The Administrator of the Na-
6 tional Oceanic and Atmospheric Administration, through
7 the National Weather Service, shall operate a program to
8 provide tsunami forecasting and warnings for the Pacific
9 Ocean region and for the Atlantic Ocean, Caribbean Sea,
10 and Gulf of Mexico region.

11 (b) COMPONENTS.—The program under this section
12 shall—

13 (1) include the tsunami warning centers estab-
14 lished under subsection (d);

15 (2) provide tsunami forecasting capability based
16 on models and measurements, including tsunami in-
17 undation models and maps for use in increasing the
18 preparedness of communities, including through the
19 TsunamiReady program;

20 (3) include a cooperative effort among the Na-
21 tional Oceanic and Atmospheric Administration, the
22 United States Geological Survey, and the National
23 Science Foundation under which the Geological Sur-
24 vey and the National Science Foundation shall pro-
25 vide rapid and reliable seismic information to the

1 National Oceanic and Atmospheric Administration
2 from international and domestic seismic networks;
3 (4) provide a capability for the dissemination of
4 warnings to at-risk States and tsunami communities
5 through rapid and reliable notification to govern-
6 ment officials and the public through such means as
7 the National Oceanic and Atmospheric Administra-
8 tion weather radio and the All Hazard Alert Broad-
9 casting Radio; and
10 (5) include any technology the Administrator
11 considers appropriate to fulfill the objectives of the
12 program under this section.
13 (c) SYSTEM AREAS.—The program under this section
14 shall operate—
15 (1) a Pacific tsunami warning system capable
16 of forecasting tsunamis anywhere in the Pacific
17 Ocean region and providing adequate warnings; and
18 (2) an Atlantic Ocean, Caribbean Sea, and Gulf
19 of Mexico tsunami warning system capable of fore-
20 casting tsunamis and providing adequate warnings
21 in areas of the Atlantic Ocean, Caribbean Sea, and
22 Gulf of Mexico that the National Weather Service
23 determines—
24 (A) to be geologically active, or to have sig-
25 nificant potential for geological activity; and

1 (B) to pose significant risks of tsunamis
2 for States along the coastal areas of the Atlan-
3 tic Ocean, Caribbean Sea, or Gulf of Mexico.
4 (d) TSUNAMI WARNING CENTERS.—
5 (1) IN GENERAL.—The Administrator, through
6 the National Weather Service, shall maintain or
7 establish—
8 (A) a Pacific Tsunami Warning Center in
9 Hawaii;
10 (B) a West Coast and Alaska Tsunami
11 Warning Center in Alaska; and
12 (C) any additional forecast and warning
13 centers determined by the National Weather
14 Service to be necessary.
15 (2) RESPONSIBILITIES.—The responsibilities of
16 each tsunami warning center shall include—
17 (A) continuously monitoring data from
18 seismological, deep ocean, and tidal monitoring
19 stations;
20 (B) evaluating earthquakes that have the
21 potential to generate tsunamis;
22 (C) evaluating deep ocean buoy data and
23 tidal monitoring stations for indications of tsu-
24 nami resulting from earthquakes and other
25 sources;

1 (D) disseminating forecasts and tsunami
2 warning bulletins to Federal, State, and local
3 government officials and the public;
4 (E) coordinating with the tsunami hazard
5 mitigation program described in section 4 to en-
6 sure ongoing sharing of information between
7 forecasters and emergency management offi-
8 cials; and
9 (F) making data gathered under this Act
10 and post-warning analyses conducted by the
11 National Weather Service available to research-
12 ers.
13 (e) TRANSFER OF TECHNOLOGY; MAINTENANCE AND
14 UPGRADES.—
15 (1) IN GENERAL.—In carrying out this section,
16 the National Weather Service shall—
17 (A) develop requirements for the equip-
18 ment used to forecast tsunamis, which shall in-
19 clude provisions for multipurpose detection plat-
20 forms, reliability and performance metrics, and
21 to the maximum extent practicable how the
22 equipment will be integrated with other United
23 States and global ocean and coastal observation
24 systems, the global earth observing system of

1 systems, global seismic networks, and the Ad-
2 vanced National Seismic System; and
3 (B) develop and execute a plan for the
4 transfer of technology from ongoing research
5 described in section 5 into the program under
6 this section.
7 (2) REPORT TO CONGRESS.—(A) Not later than
8 1 year after the date of enactment of this Act, the
9 National Weather Service shall transmit to Congress
10 a report on how the tsunami forecast system under
11 this section will be integrated with other United
12 States and global ocean and coastal observation sys-
13 tems, the global earth observing system of systems,
14 global seismic networks, and the Advanced National
15 Seismic System.
16 (B) Not later than 3 years after the date of en-
17 actment to this Act, the National Weather Service
18 shall transmit a report to Congress on how tech-
19 nology developed under section 5 is being trans-
20 ferred into the program under this section.
21 (f) CONGRESSIONAL NOTIFICATIONS.—The Adminis-
22 trator shall notify the Senate Committee on Commerce,
23 Science, and Transportation and the House of Represent-
24 atives Committee on Science within 3 months of—

1 (1) impaired regional forecasting capabilities
2 due to equipment or system failures; and
3 (2) significant contractor failures or delays in
4 completing work associated with the tsunami fore-
5 casting and warning system.
6 (g) EXTERNAL REVIEW.—The Administrator of the
7 National Oceanic and Atmospheric Administration shall
8 enter into an arrangement with the National Academy of
9 Sciences to review the tsunami detection, forecast, and
10 warning program operated by the National Weather Serv-
11 ice under this Act to assess further modernization and cov-
12 erage needs, as well as long-term operational reliability
13 issues, taking into account measures implemented under
14 this Act. The review shall also include an assessment of
15 how well the forecast equipment has been integrated into
16 other United States and global ocean and coastal observa-
17 tion systems and the global earth observing system of sys-
18 tems. Not later than 2 years after the date of enactment
19 of this Act, the Administrator shall transmit a report con-
20 taining the National Academy of Sciences' recommenda-
21 tions, the Administrator's responses to the recommenda-
22 tions, including those where the Administrator disagrees
23 with the Academy, a timetable to implement the accepted
24 recommendations, and the cost of implementing all the
25 Academy's recommendations, to the Senate Committee on

1 Commerce, Science, and Transportation and the House of
2 Representatives Committee on Science.

3 **SEC. 4. TSUNAMI HAZARD MITIGATION PROGRAM.**

4 (a) IN GENERAL.—The Administrator of the Na-
5 tional Oceanic and Atmospheric Administration, through
6 the National Weather Service, shall conduct a community-
7 based tsunami hazard mitigation program to improve tsu-
8 nami preparedness of at-risk areas in the United States
9 and its territories.

10 (b) COORDINATING COMMITTEE.—In conducting the
11 program under this section, the Administrator shall estab-
12 lish a coordinating committee comprising representatives
13 of Federal, State, local, and tribal government officials.
14 The committee shall—

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

18 (2) ensure that areas described in section 3(c)
19 in the United States and its territories can have the
20 opportunity to participate in the program; and

21 (3) provide recommendations to the National
22 Weather Service on how to improve the
23 TsunamiReady program, particularly on ways to
24 make communities more tsunami resilient through

1 the use of inundation maps and other mitigation
2 practices.
3 (c) PROGRAM COMPONENTS.—The program under
4 this section shall—
5 (1) use National Oceanic and Atmospheric Ad-
6 ministration inundation models to improve the qual-
7 ity and extent of inundation mapping, including as-
8 sessment of vulnerable inner coastal areas;
9 (2) promote and improve community outreach
10 and education networks and programs to ensure
11 community readiness, including the development of
12 multi-hazard risk and vulnerability assessment train-
13 ing and decision support tools, implementation of
14 technical training and public education programs,
15 and provide for certification of prepared commu-
16 nities;
17 (3) integrate tsunami preparedness and mitiga-
18 tion programs into ongoing hazard warning and risk
19 management programs in affected areas;
20 (4) promote the adoption of tsunami warning
21 and mitigation measures by Federal, State, tribal,
22 and local governments and nongovernmental entities,
23 including educational programs to discourage devel-
24 opment in high-risk areas; and

1 (5) provide for periodic external review of the
2 program.

3 **SEC. 5. TSUNAMI RESEARCH PROGRAM.**

4 The Administrator of the National Oceanic and At-
5 mospheric Administration shall, in consultation with other
6 agencies and academic institutions, establish or maintain
7 a tsunami research program to develop detection, forecast,
8 communication, and mitigation science and technology, in-
9 cluding advanced sensing techniques, information and
10 communication technology, data collection, analysis, and
11 assessment for tsunami tracking and numerical forecast
12 modeling. Such research program shall—

13 (1) consider other appropriate research to miti-
14 gate the impact of tsunamis;

15 (2) coordinate with the National Weather Serv-
16 ice on technology to be transferred to operations;
17 and

18 (3) ensure that research and findings are avail-
19 able to the scientific community.

20 **SEC. 6. GLOBAL TSUNAMI WARNING AND MITIGATION NET-**
21 **WORK.**

22 (a) INTERNATIONAL TSUNAMI WARNING SYSTEM.—
23 The Administrator of the National Oceanic and Atmos-
24 pheric Administration, through the National Weather
25 Service, in coordination with other members of the United

1 States Interagency Committee of the National Tsunami
2 Mitigation Program, shall provide technical assistance and
3 training to the Intergovernmental Oceanographic Commis-
4 sion, the World Meteorological Organization, and other
5 international entities, as part of international efforts to
6 develop a fully functional global tsunami forecast and
7 warning system comprising regional tsunami warning net-
8 works, modeled on the International Tsunami Warning
9 System of the Pacific.

10 (b) INTERNATIONAL TSUNAMI INFORMATION CEN-
11 TER.—The Administrator of the National Oceanic and At-
12 mospheric Administration, through the National Weather
13 Service, shall operate an International Tsunami Informa-
14 tion Center to improve tsunami preparedness for all Pa-
15 cific Ocean nations participating in the International Tsu-
16 nami Warning System of the Pacific, and which may also
17 provide such assistance to other nations participating in
18 a global tsunami warning system established through the
19 Intergovernmental Oceanographic Commission. As part of
20 its responsibilities around the world, the Center shall—

21 (1) monitor international tsunami warning ac-
22 tivities around the world;

23 (2) assist member states in establishing na-
24 tional warning systems, and make information avail-

1 able on current technologies for tsunami warning
2 systems;
3 (3) maintain a library of materials to promul-
4 gate knowledge about tsunamis in general and for
5 use by the scientific community; and
6 (4) disseminate information, including edu-
7 cational materials and research reports.
8 (c) DETECTION EQUIPMENT; TECHNICAL ADVICE
9 AND TRAINING.—In carrying out this section, the Na-
10 tional Weather Service—
11 (1) shall give priority to assisting nations in
12 identifying vulnerable coastal areas, creating inunda-
13 tion maps, obtaining or designing real-time detection
14 and reporting equipment, and establishing commu-
15 nication and warning networks and contact points in
16 each vulnerable nation; and
17 (2) may establish a process for transfer of de-
18 tection and communication technology to affected
19 nations for the purposes of establishing the inter-
20 national tsunami warning system.
21 (d) DATA-SHARING REQUIREMENT.—The National
22 Weather Service may not provide assistance under this
23 section for any nation unless that nation agrees to share
24 relevant data or products associated with the development

1 and operation of the tsunami warning network in that re-
2 gion.

3 **SEC. 7. AUTHORIZATION OF APPROPRIATIONS.**

4 There are authorized to be appropriated to the Ad-
5 ministrator of the National Oceanic and Atmospheric Ad-
6 ministration $30,000,000 for each of fiscal years 2006
7 through 2008 to carry out this Act. Of the amounts appro-
8 priated for any fiscal year authorized under this Act—

9 (1) 70 percent shall be for the tsunami forecast
10 and warning systems under section 3 and inter-
11 national activities under section 6;

12 (2) 20 percent shall be for the tsunami hazard
13 mitigation program under section 4; and

14 (3) 10 percent shall be for the tsunami research
15 program under section 5.

SECTION-BY-SECTION ANALYSIS OF H.R. 1674,
UNITED STATES TSUNAMI WARNING AND EDUCATION ACT

Section 1. Short Title.

United States Tsunami Warning and Education Act

Section 2. Purposes.

Describes the purposes of the Act: (1) to improve tsunami detection, forecasting, warnings, notification, preparedness and mitigation both in the U.S. and around the world; (2) to enhance and modernize the existing Pacific tsunami warning system and to expand detection and warning systems to the Atlantic Ocean, Caribbean Sea and Gulf of Mexico; (3) to improve tsunami mapping, modeling, research and assessment efforts; (4) to improve and increase education and outreach activities; (5) to provide technical and other assistance to international efforts to establish regional tsunami warning systems in vulnerable areas worldwide, including the Indian Ocean region; and (6) to improve federal, State, and international coordination for tsunami and other coastal hazard warnings and preparedness.

Section 3. Tsunami Forecasting and Warning Program.

Requires NOAA to operate a program to provide tsunami forecasting and warnings for the Pacific Ocean region, and for the Atlantic Ocean, Caribbean Sea and Gulf of Mexico regions.

The components of the program shall include: tsunami warning centers; forecasting capabilities, based on measurements, models and maps; a cooperative effort among NOAA, USGS, and NSF to provide seismic information; and the capability for the rapid and reliable dissemination of tsunami warnings to States and communities.

Directs the National Weather Service to develop requirements for the equipment used to forecast tsunamis, including how the equipment will be integrated into other United States and global environmental observing systems and a plan for the transfer of technology from research into operations. Requires the National Weather Service to submit reports to Congress on how it will integrate the equipment and on the technology transfer plan. Also requires the National Weather Service to notify Congress when tsunami forecasting capabilities are impaired for more than three months due to equipment or contractor problems.

Requires the Administrator to enter into an arrangement with the National Academy of Sciences to evaluate and provide recommendation on how to improve NOAA's tsunami detection, forecast and warning activities.

Section 4. Tsunami Hazard Mitigation Program.

Directs the National Weather Service to conduct a community-based tsunami hazard mitigation program to improve tsunami preparedness of at-risk areas. Establishes a coordinating committee of federal and State officials, which shall: develop a plan for ensuring wide participation in the program; determine how funds will be allocated; and provide recommendations to increase resiliency of vulnerable communities. Specifically, the program will: use NOAA models and maps to assess vulnerable areas; promote and improve community outreach and education networks; and integrate tsunami preparedness and mitigation programs into ongoing hazard warnings and planning.

Section 5. Tsunami Research Program.

Requires NOAA to establish a tsunami research program to develop detection, forecasting, communication and mitigation tools and technologies. Directs the program to work with the National Weather Service on ways to transfer the research into operations.

Section 6. Global Tsunami Warning and Mitigation Network.

Directs NOAA to provide technical assistance and training to the international community toward the development of a fully functional global tsunami forecast and warning system. Establishes the International Tsunami Information Center to provide information and advice to nations around the world to improve tsunami preparedness.

Section 7. Authorization of Appropriations.

Provides $30 million for each of fiscal years 2006–2008 to carry out the act. Specifies that of any funds appropriated for activities under this act, 70 percent should be used for the tsunami forecast and warning systems under section three and section six, 20 percent should be used for the tsunami hazard mitigation program

under section four, and 10 percent should be for the tsunami research program under section five.

COMMITTEE ON SCIENCE
FULL COMMITTEE MARKUP

May 4, 2005

AMENDMENT ROSTER

H.R. 1674, United States Tsunami Warning and Education Act
--Motion to adopt the bill, as amended: agreed to by a voice vote.
--Motion to report the bill, as amended: agreed to by a voice vote.

No.	Sponsor	Description	Results
1.	Mr. Boehlert	Manager's Amendment	--Adopted by a voice vote.
2.	Mr. Wu	Amendment to authorize a study of the potential for improving communication systems for tsunami hazard warnings.	--Unanimous consent request to withdraw the amendment: agreed to.

AMENDMENT TO H.R. 1674
OFFERED BY MR. BOEHLERT OF NEW YORK

Page 2, line 4, strike "and elsewhere in the world".

Page 4, lines 22 and 23, strike "the National Weather Service determines" and insert "are determined".

Page 9, line 3, insert "**NATIONAL**" before "**TSUNAMI HAZARD**".

Page 9, line 13, insert "The Administrator may establish subcommittees to address region-specific issues." after "tribal government officials.".

Page 10, lines 5 and 6, strike "National Oceanic and Atmospheric Administration inundation models" and insert "inundation models that meet a standard of accuracy defined by the National Oceanic and Atmospheric Administration".

Page 10, line 8, strike "areas" and insert "and nearshore areas, in a coordinated and standardized fashion to maximize resources and the utility of data collected".

Page 11, line 6, insert "and with the Coordinating Committee established under section 4(b)," after "academic institutions,".

Page 11, line 17, strike "and".

Page 11, line 18, redesignate paragraph (3) as paragraph (4).

Page 11, after line 17, insert the following new paragraph:

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

Page 12, line 1, insert "Hazard" after "National Tsunami".

Page 12, line 13, insert "in cooperation with the Intergovernmental Oceanographic Commission," after "National Weather Service,".

Page 13, line 21, through page 14, line 2, amend subsection (d) to read as follows:

4 (d) DATA-SHARING REQUIREMENT.—The National
5 Weather Service, when deciding to provide assistance
6 under this section, may take into consideration the data
7 sharing policies and practices of nations proposed to re-

1 ceive such assistance, with a goal to encourage all nations
2 to support full and open exchange of data.

Page 14, lines 3 through 15, amend section 7 to read as follows:

3 **SEC. 7. AUTHORIZATION OF APPROPRIATIONS.**

4 There are authorized to be appropriated to the Ad-
5 ministrator of the National Oceanic and Atmospheric Ad-
6 ministration to carry out this Act—

7 (1) $26,000,000 for fiscal year 2006, of
8 which—

9 (A) 62 percent shall be for the tsunami
10 forecast and warning systems under section 3
11 and international activities under section 6;

12 (B) 30 percent shall be for the tsunami
13 hazard mitigation program under section 4; and

14 (C) 8 percent shall be for the tsunami re-
15 search program under section 5;

16 (2) $30,000,000 for fiscal year 2007, of
17 which—

18 (A) 66 percent shall be for the tsunami
19 forecast and warning systems under section 3
20 and international activities under section 6;

21 (B) 26 percent shall be for the tsunami
22 hazard mitigation program under section 4; and

1 (C) 8 percent shall be for the tsunami re-
2 search program under section 5; and
3 (3) $30,000,000 for fiscal year 2008, of
4 which—
5 (A) 66 percent shall be for the tsunami
6 forecast and warning systems under section 3
7 and international activities under section 6;
8 (B) 26 percent shall be for the tsunami
9 hazard mitigation program under section 4; and
10 (C) 8 percent shall be for the tsunami re-
11 search program under section 5.

AMENDMENT TO H.R. 1674

OFFERED BY MR. WU OF OREGON

Page 11, line 4, insert "(a) IN GENERAL.—" before "The Administrator".

Page 11, after line 19, insert the following new subsection:

1 (b) COMMUNICATIONS TECHNOLOGY.—The Adminis-
2 trator, in consultation with the Assistant Secretary of
3 Commerce for Communications and Information and the
4 Federal Communications Commission, shall investigate
5 the potential for improved communications systems for
6 tsunami and other hazard warning by incorporating into
7 the existing network a full range of options for providing
8 those warnings to the public, including, as appropriate—
9 (1) telephones, including special alert rings;
10 (2) wireless and satellite technology, including
11 cellular telephones and pagers;
12 (3) the Internet, including email;
13 (4) automatic alert televisions and radios;
14 (5) innovative and low-cost combination of such
15 technologies that may provide access to remote
16 areas; and

1 (6) other technologies that may be developed.