

reach, and mitigation to protect life and property in the United States;

(2) to enhance and modernize the existing United States Tsunami Warning System to increase the accuracy of forecasts and warnings, to ensure full coverage of tsunami threats to the United States with a network of detection assets, and to reduce false alarms;

(3) to improve and develop standards and guidelines for mapping, modeling, and assessment efforts to improve tsunami detection, forecasting, warnings, notification, mitigation, resiliency, response, outreach, and recovery;

(4) to improve research efforts related to improving tsunami detection, forecasting, warnings, notification, mitigation, resiliency, response, outreach, and recovery;

(5) to improve, increase, and develop uniform standards and guidelines for 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, including the warning signs of locally generated tsunami;

(6) to provide technical and other assistance to speed international efforts to establish regional tsunami warning systems in vulnerable areas worldwide;

(7) to foster resilient communities in the face of tsunami and other similar coastal hazards; and

(8) to improve Federal, State, and international coordination for detection, warnings, and outreach for tsunami and other coastal impacts.

(Pub. L. 109-424, § 3, Dec. 20, 2006, 120 Stat. 2902; Pub. L. 109-479, title VIII, § 803, Jan. 12, 2007, 120 Stat. 3653; Pub. L. 115-25, title V, §§ 503, 512(a), Apr. 18, 2017, 131 Stat. 115, 128.)

#### CODIFICATION

Pub. L. 109-424 and title VIII of Pub. L. 109-479 enacted substantially identical sections. Pub. L. 109-424 was repealed by section 512(a) of Pub. L. 115-25.

#### AMENDMENTS

2017—Par. (1). Pub. L. 115-25, § 503(1), inserted “research,” after “warnings.”

Par. (2). Pub. L. 115-25, § 503(2), amended par. (2) generally. Prior to amendment, par. (2) read as follows: “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;”

Par. (3). Pub. L. 115-25, § 503(3), amended par. (3) generally. Prior to amendment, par. (3) read as follows: “to improve mapping, modeling, research, and assessment efforts to improve tsunami detection, forecasting, warnings, notification, outreach, mitigation, response, and recovery;”

Par. (4). Pub. L. 115-25, § 503(5), added par. (4). Former par. (4) redesignated (5).

Par. (5). Pub. L. 115-25, § 503(4), (6), redesignated par. (4) as (5), substituted “, increase, and develop uniform standards and guidelines for” for “and increase”, and inserted “, including the warning signs of locally generated tsunami” after “approaching”. Former par. (5) redesignated (6).

Par. (6). Pub. L. 115-25, § 503(4), (7), redesignated par. (5) as (6) and substituted semicolon at end for

“, including the Indian Ocean; and”. Former par. (6) redesignated (8).

Par. (7). Pub. L. 115-25, § 503(8), added par. (7).

Par. (8). Pub. L. 115-25, § 503(4), redesignated par. (6) as (8).

### § 3203. Tsunami forecasting and warning program

#### (a) In general

The Administrator, through the National Weather Service and in consultation with other relevant Administration offices, shall operate a program to provide tsunami detection, forecasting, and warnings for the Pacific and Arctic Ocean regions and for the Atlantic Ocean region, including the Caribbean Sea and the Gulf of Mexico.

#### (b) Components

The program under this section shall—

(1) include the tsunami warning centers supported or maintained under subsection (d);

(2) to the degree practicable, maintain not less than 80 percent of the Deep-ocean Assessment and Reporting of Tsunamis buoy array at operational capacity to optimize data reliability;

(3) utilize and maintain an array of robust tsunami detection technologies;

(4) maintain detection equipment in operational condition to fulfill the detection, forecasting, and warning requirements of this chapter;

(5) provide tsunami forecasting capability based on models and measurements, including tsunami inundation models and maps for use in increasing the preparedness of communities and safeguarding port and harbor operations, that incorporate inputs, including—

(A) the United States and global ocean and coastal observing system;

(B) the global Earth observing system;

(C) the global seismic network;

(D) the Advanced National Seismic system;

(E) tsunami model validation using historical and paleotsunami data;

(F) digital elevation models and bathymetry; and

(G) newly developing tsunami detection methodologies using satellites and airborne remote sensing;

(6) maintain data quality and management systems to support the requirements of the program;

(7) include a cooperative effort among the Administration, the United States Geological Survey, and the National Science Foundation under which the Director of the United States Geological Survey and the Director of the National Science Foundation shall—

(A) provide rapid and reliable seismic information to the Administrator from international and domestic seismic networks; and

(B) support seismic stations installed before April 18, 2017, to supplement coverage in areas of sparse instrumentation;

(8) provide a capability for the dissemination of warnings, including graphical warning products, to at-risk States, territories, and tsu-

nam communities through rapid and reliable notification to government officials and the public, including utilization of and coordination with existing Federal warning systems, including the National Oceanic and Atmospheric Administration Weather Radio All Hazards Program and Wireless Emergency Alerts;

(9) provide and allow, as practicable, for integration of tsunami detection technologies with other environmental observing technologies and commercial and Federal undersea communications cables; and

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

**(c) Tsunami warning system**

The program under this section shall operate a tsunami warning system that—

(1) is capable of forecasting tsunami, including forecasting tsunami arrival time and inundation estimates, anywhere in the Pacific and Arctic Ocean regions and providing adequate warnings;

(2) is capable of forecasting and providing adequate warnings, including tsunami arrival time and inundation models where applicable, in areas of the Atlantic Ocean, including the 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 tsunami for States along the coastal areas of the Atlantic Ocean, Caribbean Sea, or Gulf of Mexico; and

(3) supports other international tsunami forecasting and warning efforts.

**(d) Tsunami warning centers**

**(1) In general**

The Administrator shall support or maintain centers to support the tsunami warning system required by subsection (c). The Centers<sup>1</sup> shall include—

(A) the National Tsunami Warning Center, located in Alaska, which is primarily responsible for Alaska and the continental United States;

(B) the Pacific Tsunami Warning Center, located in Hawaii, which is primarily responsible for Hawaii, the Caribbean, and other areas of the Pacific not covered by the National Center; and

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

**(2) Responsibilities**

The responsibilities of the centers supported or maintained under paragraph (1) shall include the following:

(A) Continuously monitoring data from seismological, deep ocean, coastal sea level, and tidal monitoring stations and other data sources as may be developed and deployed.

(B) Evaluating earthquakes, landslides, and volcanic eruptions that have the potential to generate tsunami.

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

(D) To the extent practicable, utilizing a range of models, including ensemble models, to predict tsunami, including arrival times, flooding estimates, coastal and harbor currents, and duration.

(E) Using data from the Integrated Ocean Observing System of the Administration in coordination with regional associations to calculate new inundation estimates and periodically update existing inundation estimates.

(F) Disseminating forecasts and tsunami warning bulletins to Federal, State, tribal, and local government officials and the public.

(G) Coordinating with the tsunami hazard mitigation program conducted under section 3204 of this title to ensure ongoing sharing of information between forecasters and emergency management officials.

(H) In coordination with the Commandant of the Coast Guard and the Administrator of the Federal Emergency Management Agency, evaluating and recommending procedures for ports and harbors at risk of tsunami inundation, including review of readiness, response, and communication strategies, and data sharing policies, to the maximum extent practicable.

(I) Making data gathered under this chapter and post-warning analyses conducted by the National Weather Service or other relevant Administration offices available to the public.

(J) Integrating and modernizing the program operated under this section with advances in tsunami science to improve performance without compromising service.

**(3) Fail-safe warning capability**

The tsunami warning centers supported or maintained under paragraph (1) shall maintain a fail-safe warning capability and perform back-up duties for each other.

**(4) Coordination with National Weather Service**

The Administrator shall coordinate with the forecast offices of the National Weather Service, the centers supported or maintained under paragraph (1), and such program offices of the Administration as the Administrator or the coordinating committee, as established in section 3204(d)<sup>2</sup> of this title, consider appropriate to ensure that regional and local forecast offices—

(A) have the technical knowledge and capability to disseminate tsunami warnings for the communities they serve;

(B) leverage connections with local emergency management officials for optimally disseminating tsunami warnings and forecasts; and

(C) implement mass communication tools in effect on the day before April 18, 2017, used by the National Weather Service on

<sup>1</sup> So in original.

<sup>2</sup> So in original. Probably should be "section 3204(b)".

such date and newer mass communication technologies as they are developed as a part of the Weather-Ready Nation program of the Administration, or otherwise, for the purpose of timely and effective delivery of tsunami warnings.

**(5) Uniform operating procedures**

The Administrator shall—

(A) develop uniform operational procedures for the centers supported or maintained under paragraph (1), including the use of software applications, checklists, decision support tools, and tsunami warning products that have been standardized across the program supported under this section;

(B) ensure that processes and products of the warning system operated under subsection (c)—

(i) reflect industry best practices when practicable;

(ii) conform to the maximum extent practicable with internationally recognized standards for information technology; and

(iii) conform to the maximum extent practicable with other warning products and practices of the National Weather Service;

(C) ensure that future adjustments to operational protocols, processes, and warning products—

(i) are made consistently across the warning system operated under subsection (c); and

(ii) are applied in a uniform manner across such warning system;

(D) establish a systematic method for information technology product development to improve long-term technology planning efforts; and

(E) disseminate guidelines and metrics for evaluating and improving tsunami forecast models.

**(6) Available resources**

The Administrator, through the National Weather Service, shall ensure that resources are available to fulfill the obligations of this chapter. This includes ensuring supercomputing resources are available to run, as rapidly as possible, such computer models as are needed for purposes of the tsunami warning system operated under subsection (c).

**(e) Transfer of technology; maintenance and upgrades**

In carrying out this section, the Administrator shall—

(1) develop requirements for the equipment used to forecast tsunami, including—

(A) provisions for multipurpose detection platforms;

(B) reliability and performance metrics; and

(C) to the maximum extent practicable, requirements for the integration of equipment with other United States and global ocean and coastal observation systems, the global Earth observing system of systems, the global seismic networks, and the Advanced National Seismic System;

(2) develop and execute a plan for the transfer of technology from ongoing research conducted as part of the program supported or maintained under section 3205 of this title into the program under this section; and

(3) ensure that the Administration's operational tsunami detection equipment is properly maintained.

**(f) Federal cooperation**

When deploying and maintaining tsunami detection technologies under the program under this section, the Administrator shall—

(1) identify which assets of other Federal agencies are necessary to support such program; and

(2) work with each agency identified under paragraph (1)—

(A) to acquire the agency's assistance; and

(B) to prioritize the necessary assets in support of the tsunami forecast and warning program.

**(g) Congressional notifications**

**(1) In general**

The Administrator shall notify the Committee on Commerce, Science, and Transportation of the Senate and the Committee on Science of the House of Representatives within 30 days of—

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

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

(C) the occurrence of a significant tsunami warning.

**(2) Contents**

In a case in which notice is submitted under paragraph (1) within 30 days of a significant tsunami warning described in subparagraph (C) of such paragraph, such notice shall include, as appropriate, brief information and analysis of—

(A) the accuracy of the tsunami model used;

(B) the specific deep ocean or other monitoring equipment that detected the incident, as well as the deep ocean or other monitoring equipment that did not detect the incident due to malfunction or other reasons;

(C) the effectiveness of the warning communication, including the dissemination of warnings with State, territory, local, and tribal partners in the affected area under the jurisdiction of the National Weather Service; and

(D) such other findings as the Administrator considers appropriate.

(Pub. L. 109-424, §4, Dec. 20, 2006, 120 Stat. 2903; Pub. L. 109-479, title VIII, §804, Jan. 12, 2007, 120 Stat. 3654; Pub. L. 115-25, title V, §§504, 512(a), Apr. 18, 2017, 131 Stat. 116, 128.)

REFERENCES IN TEXT

Section 3205 of this title, referred to in subsec. (e)(2), was in the original "section 6", meaning section 6 of Pub. L. 109-424, and was translated as if it referred to section 806 of Pub. L. 109-479, which enacted a substantially identical section 3205 of this title. Section 6 of

Pub. L. 109–424 was repealed by section 512(a) of Pub. L. 115–25.

#### CODIFICATION

Pub. L. 109–424 and title VIII of Pub. L. 109–479 enacted substantially identical sections. Pub. L. 109–424 was repealed by section 512(a) of Pub. L. 115–25.

#### AMENDMENTS

2017—Subsec. (a). Pub. L. 115–25, § 504(a), substituted “Atlantic Ocean region, including the Caribbean Sea and the Gulf of Mexico” for “Atlantic Ocean, Caribbean Sea, and Gulf of Mexico region”.

Subsec. (b)(1). Pub. L. 115–25, § 504(b)(1), substituted “supported or maintained” for “established”.

Subsec. (b)(2). Pub. L. 115–25, § 504(b)(4), added par. (2). Former par. (2) redesignated (3).

Subsec. (b)(3), (4). Pub. L. 115–25, § 504(b)(3), redesignated pars. (2) and (3) as (3) and (4), respectively. Former par. (4) redesignated (5).

Subsec. (b)(5). Pub. L. 115–25, § 504(b)(5), amended par. (5) generally. Prior to amendment, par. (5) read as follows: “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;”.

Pub. L. 115–25, § 504(b)(3), redesignated par. (4) as (5). Former par. (5) redesignated (6).

Subsec. (b)(6). Pub. L. 115–25, § 504(b)(3), redesignated par. (5) as (6). Former par. (6) redesignated (7).

Subsec. (b)(7). Pub. L. 115–25, § 504(b)(6), amended par. (7) generally. Prior to amendment, par. (7) read as follows: “include a cooperative effort among the 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 Administration from international and domestic seismic networks;”.

Pub. L. 115–25, § 504(b)(3), redesignated par. (6) as (7). Former par. (7) redesignated (8).

Subsec. (b)(8). Pub. L. 115–25, § 504(b)(2), (7), redesignated par. (7) as (8) and inserted “, including graphical warning products,” after “warnings”, “, territories,” after “States” and “and Wireless Emergency Alerts” after “Hazards Program”. Former par. (8) redesignated (9).

Subsec. (b)(9). Pub. L. 115–25, § 504(b)(2), (8), redesignated par. (8) as (9) and inserted “provide and” before “allow” and “and commercial and Federal undersea communications cables” after “observing technologies”. Former par. (9) redesignated (10).

Subsec. (b)(10). Pub. L. 115–25, § 504(b)(2), redesignated par. (9) as (10).

Subsec. (c). Pub. L. 115–25, § 504(c), amended subsec. (c) generally. Prior to amendment, subsec. (c) related to tsunami warning system areas.

Subsec. (d). Pub. L. 115–25, § 504(d), amended subsec. (d) generally. Prior to amendment, subsec. (d) related to the location of tsunami warning centers and the responsibilities of the centers.

Subsec. (e). Pub. L. 115–25, § 504(e), amended subsec. (e) generally. Prior to amendment, subsec. (e) related to the National Weather Service’s responsibilities regarding tsunami equipment and technology.

Subsec. (f). Pub. L. 115–25, § 504(f), amended subsec. (f) generally. Prior to amendment, text read as follows: “When deploying and maintaining tsunami detection technologies, the Administrator shall seek the assistance and assets of other appropriate Federal agencies.”

Subsec. (g). Pub. L. 115–25, § 504(h), designated existing provisions as par. (1) and inserted heading, redesignated former pars. (1) and (2) as subpars. (A) and (B), respectively, of par. (1) and realigned margins, added subpar. (C) of par. (1), and added par. (2).

Pub. L. 115–25, § 504(g)(1), (3), redesignated subsec. (h) as (g) and struck out former subsec. (g) which related to annual equipment certification.

Subsec. (h). Pub. L. 115–25, § 504(g)(3), redesignated subsec. (h) as (g).

Subsecs. (i) to (k). Pub. L. 115–25, § 504(g)(2), struck out subsecs. (i) to (k) which related to Comptroller General report, external review by the National Academy of Sciences, and establishment of a process for monitoring and certifying contractor performance, respectively.

#### CHANGE OF NAME

Committee on Science of House of Representatives changed to Committee on Science and Technology of House of Representatives by House Resolution No. 6, One Hundred Tenth Congress, Jan. 5, 2007. Committee on Science and Technology of House of Representatives changed to Committee on Science, Space, and Technology of House of Representatives by House Resolution No. 5, One Hundred Twelfth Congress, Jan. 5, 2011.

### § 3204. National tsunami hazard mitigation program

#### (a) Program required

The Administrator, in coordination with the Administrator of the Federal Emergency Management Agency and the heads of such other agencies as the Administrator considers relevant, shall conduct a community-based tsunami hazard mitigation program to improve tsunami preparedness and resiliency of at-risk areas in the United States and the territories of the United States.

#### (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 3203(c) of this title in the United States and its territories can have the opportunity to participate in the program;

(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; and

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

#### (c) Program components

The Program conducted under subsection (a) shall include the following:

(1) Technical and financial assistance to coastal States, territories, tribes, and local governments to develop and implement activities under this section.

(2) Integration of tsunami preparedness and mitigation programs into ongoing State-based hazard warning, resilience planning, and risk management activities, including predisaster planning, emergency response, evacuation