NATIONAL WEATHER SERVICE POLICY DIRECTIVE 10-7
FEBRUARY 20, 2023

Operations and Services

TSUNAMI WARNING SERVICES

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SUMMARY OF REVISIONS: This directive supersedes NWS Policy Directive 10-7, *Tsunami Warning Services*, dated February 20, 2023. This is an administrative update made only to fix the broken links under Notice. No content changes were made with this update, and the effective date was not affected.

1. A tsunami is one of the most powerful and destructive natural hazards. It is a series of waves caused by a large and sudden displacement of ocean water. Tsunamis radiate outward in all directions from the disturbance and can move across entire ocean basins. Most tsunamis are caused by large earthquakes below or near the ocean floor, but tsunamis can also be caused by landslides, volcanic activity, certain types of weather, and bolide impacts (e.g., asteroids, comets).

2. The objective of this policy is to set forth roles and responsibilities for service delivery of the National Oceanic and Atmospheric Administration (NOAA) National Weather Service (NWS) tsunami forecasts and warnings. Consistent with the Tsunami Warning, Education, and Research Act of 2017, 33 U.S.C. §§ 3201 - 3208, NWS operational objectives are to: a) rapidly detect and characterize potential tsunami sources to their tsunami potential for the area of responsibility (designated service areas), b) forecast tsunami wave arrival times and, when possible, provide potential local impacts, c) detect and measure the tsunami waves in order to refine the forecast and alert levels, d) provide timely and effective tsunami information and warnings to coastal populations within the designated service areas to reduce the risks of tsunamis, especially to human life, and e) carry out disaster preparedness activities.

To achieve these objectives, the NWS operates two Tsunami Warning Centers (TWC): the Pacific Tsunami Warning Center (PTWC) located within the NOAA Inouye Regional Center (IRC) in Honolulu, Hawaii, and the National Tsunami Warning Center (NTWC) in Palmer, Alaska. Each Center provides tsunami warning services to its designated service areas as defined in sections 3.3.1 and 3.3.2 and acts as a backup to the other Center. In support of warning operations, the Centers monitor seismic and sea level stations for rapid, accurate, and reliable detection and evaluation of earthquakes and tsunamis. Although much of the seismic and sea level data comes from cooperating organizations, the NWS operates additional seismic

and sea level stations as needed to carry out the mission. The NWS also accesses or operates a wide and effective communications network for receiving the data and disseminating information and warnings.

3. This directive establishes the following authorities and responsibilities:

3.1 AFSO Responsibilities

NWS' Analyze, Forecast and Support Office (AFSO) is responsible for managing the Tsunami Service Program. The Tsunami Service Program Lead responsibilities include:

a. Establishing national policies and procedures for the provision of consistent domestic and international tsunami products and services;
b. Developing and maintaining national NWS tsunami warning system directives and instructions;
c. Providing support for NWS awareness, preparedness, and external warning coordination, including the National Tsunami Hazard Mitigation Program (NTHMP) and the NWS TsunamiReady® program;
d. Identifying requirements for necessary changes in existing plans, policies and procedures affecting the Tsunami Warning System (TWS);
e. Providing support for technical end-user education, dissemination and communications, and user notification programs as they relate to tsunami warning services;
f. Monitoring the national performance of the Tsunami Program;
g. Providing input to AFSO Management on Tsunami Program budget (execution managed through AFS Forecast Services Division and FMC Directors);
h. Providing support for international efforts to develop a fully functional global tsunami forecast and warning system comprising regional tsunami warning networks through technology transfer and training; and,
i. Chairing the Tsunami Research Advisory Council to include making project funding recommendations based on coordinated TWC input.

3.2 Regional Headquarters

The Pacific, Alaska, Western, Southern, and Eastern Regional Headquarters will:

a. Operate, monitor, and maintain the tsunami warning program within their designated service areas and provide regional guidelines and instructions to their field offices, as required;
b. Maintain liaison with international, national, state, county, and local emergency services agencies, as required;
c. Interact with the TWCs, NWS Headquarters (NWSH), the Tsunami Service Program Lead, other regions, the NTHMP, and other Federal, state, and local government agencies in planning improved tsunami warning services; and,
d. Provide input on Tsunami Service Program requirements to the TWCs and AFSO.

3.2.1 The Pacific Region Headquarters (PRH) provides administrative, facility, travel, financial and other support to the PTWC and to the International Tsunami Information Center (ITIC) and the ITIC Caribbean Office (ITIC-CAR). PRH also provides additional guidance to its field

offices on the communication and disaster preparedness aspects of the Tsunami Program, and establishes and coordinates regional program requirements with the other regions and NWSH.

3.2.2 The Alaska Region Headquarters (ARH) provides administrative, facility, travel, financial, and other support to the NTWC. ARH also provides additional guidance to its field offices on the communication and disaster preparedness aspects of the Tsunami Program, and establishes and coordinates regional program requirements with the other regions and NWSH.

3.2.3 The Southern, Western, and Eastern Region Headquarters provide additional guidance to field offices on the communication and disaster preparedness aspects of the Tsunami Program and establish and coordinate regional program requirements with the other regions and NWSH.

3.2.4 Each regional headquarters is responsible for implementing NWS policy for disaster preparedness activities for potential tsunami events and maintaining an effective regional disaster preparedness program. Warning Coordination Meteorologists (WCMs) at coastal NWS field offices will carry out tsunami disaster preparedness activities in their designated service areas with Federal, regional, state, county, and local emergency management or civil defense officials.

The TWCs also assist Regional Directors within their designated service areas in designing and implementing national and regional NWS policies to ensure adequate public preparedness for tsunamis. Tsunami public preparedness is done cooperatively among the NWS, NOAA's National Ocean Service, Federal Emergency Management Agency, U.S. Geological Survey, the NTHMP, and state and local civil defense or emergency management agencies.

3.3 General Tsunami Warning Center Responsibilities.

a. Operations. Each TWC is responsible for rapidly detecting, locating, sizing and otherwise parameterizing possible tsunami sources for their hazard potential; for detecting and measuring tsunamis; for evaluating the tsunami threat based on all available data; and for issuing effective Tsunami Warning, Advisory, Watch, and Information Bulletins, as well as other supporting products. Each Center is also responsible for supplying their operational data to the other Center, to the National Earthquake Information Center (NEIC), and to other agencies, as appropriate. The TWCs and the NWS are responsible for the installation, maintenance and operation of certain seismic, sea level, and telemetry equipment that provides direct support to their warning programs. TWCs are also responsible for conducting regular message dissemination tests to ensure proper and efficient product delivery. The TWCs participate in exercises for testing and improving components of the TWS.

b. Development. The TWCs develop techniques necessary to upgrade and improve operational aspects of the TWS. In addition, the TWCs interact and collaborate with government and academic research and development entities to stay abreast of research in tsunami generation, modeling, detection, and forecasting.

c. Procedures and Policy. The TWCs provide technical information and recommendations regarding tsunami warning and mitigation procedures and policies to TWS-related decision-making and governing bodies within the NWS and NOAA, and to local, state, national, and international levels.

d. Outreach. The TWCs conduct or participate in outreach activities to improve tsunami awareness and education for the public, the scientific community, emergency managers, and policy-makers. These activities are conducted secondary to TWS operational priorities.

e. Other. The TWCs also serve as collection sites for geophysical and oceanographic data under agreements with the U.S. Geological Survey and other U.S. and foreign agencies.

3.3.1 National Tsunami Warning Center (NTWC)

The NTWC, located at Palmer, Alaska, is responsible for the preparation and dissemination of Tsunami Warning, Advisory, Watch, and Information products to the NTWC designated service areas. The NTWC designated service areas are the coastal regions of all U.S. states (except Hawaii) and the Pacific and Atlantic Provinces of Canada. NTWC has the primary responsibility for the detection and parameterization of potentially tsunamigenic sources occurring within its Tsunami Source Region as defined in NWS Instruction (NWSI) 10-701. The NTWC serves as a backup to the PTWC.

3.3.2 Pacific Tsunami Warning Center (PTWC)

The PTWC, located within the NOAA Inouye Regional Center (IRC), Honolulu, Hawaii, is responsible for the preparation and dissemination of Tsunami Warning, Advisory, Watch, and Information products to the PTWC designated service areas. The PTWC designated service areas are Hawaii and all U.S. territories (including American Samoa, the Commonwealth of the Northern Mariana Islands, Guam, Puerto Rico, and the U.S. Virgin Islands) and countries in the Pacific Ocean, the Caribbean Sea, and adjacent regions. International responsibilities are by agreement and in coordination with the UNESCO/IOC Tsunami Programme. PTWC has the primary responsibility for the detection and parameterization of potentially tsunamigenic sources that might affect its Tsunami Source Region as defined in NWSI 10-701. The PTWC serves as a backup to the NTWC.

3.3.3 International Tsunami Information Center (ITIC)

The ITIC is operated in support of the NWS Tsunami Warning System and UNESCO/IOC operations. Located within the IRC, Honolulu, Hawaii the ITIC was established upon request of the IOC and is maintained by the NWS to strengthen the TWS and to assist IOC Member States in mitigating the effects of tsunamis. The ITIC operates an office in Mayaguez, Puerto Rico to support the Caribbean (ITIC Caribbean Office). The ITIC Director reports directly to the appropriate IOC authorities on matters not affecting NWS operations or U.S. policy and to the NWS Pacific Region Director for all other purposes.

3.4 Weather Forecast Offices (WFOs) and Pacific Region Weather Service Office (WSO)

WFOs and the Pacific Region WSO in American Samoa with coastal areas of responsibility are responsible for planning for, and taking appropriate action when there is a threat of a tsunami. These actions include dissemination of tsunami warnings, advisories, and watches from the TWCs, and the issuance of appropriate local statements if required. Coastal WFOs and the Pacific Region WSO are also responsible for ensuring the readiness of office staff and systems through routine operational drills, and for coordinating community outreach activities to increase

tsunami hazard awareness. Coastal WFO WCMs assist in community preparedness and emergency planning for tsunami events and take the lead role promoting the TsunamiReady® Program, and performing liaison functions with the state and local departments of homeland security/emergency management and homeland security in their service area, and assist them as appropriate in their responsibilities to develop warning procedures, plans, and evacuations. WFOs and the Pacific Region WSO should cooperate with the state and local emergency management and homeland security agencies and where possible, aid in their warning dissemination.

3.5 Office of Observations Responsibilities

NWS' Office of Observations is responsible for operational availability and monitoring deep ocean, coastal sea level, and tidal monitoring stations in support of the TWCs, and to plan and coordinate with the Tsunami Service Program on service requirements to determine system requirements and technical solutions.

3.6 Office of Dissemination Responsibilities

NWS' Office of Dissemination is responsible for ensuring, through program planning, that policy, procedures and backup systems are in place to sustain dissemination system operational capabilities to support the TWCs.

3.7 Office of Central Processing

NWS' Office of Central Processing is responsible for providing:

1) System engineering, software management, facilities engineering, communications, maintenance, and logistical services to sustain operational systems supporting the TWCs.
2) Real-time operational support and maintenance for nationally-delivered tsunami applications.

4. Compliance with this directive will be monitored by the TWCs, the NWS regions, AFSO, and the NWS Assistant Administrator (AA) based on defined performance measures.

5. This directive is supported by the documents referenced in Appendix A. Procedural directives will be issued to implement this policy as needed and determined by the AA, AFSO, and NWS Regions.

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Kenneth E. Graham Date
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Appendix A

References. This policy directive is supported by:

- NWS Instruction 10-701: *Tsunami Warning Center Operations*
- NWS Instruction 10-702: *International Tsunami Information Center*
- NWS Instruction 10-703: *Post-Tsunami and Warning Effectiveness Surveys*
- NWS Instruction 10-704: *The TsunamiReady Recognition Program*
- Tsunami Warning, Education, and Research Act of 2017, 33 U.S.C. §§ 3201 - 3208.