



## TSUNAMIREADY® GUIDELINES

### **GUIDELINES INTRODUCTION**

In order for the National Weather Service (NWS) to recognize a community as TsunamiReady®, the community must have implemented the activities established in the TsunamiReady® Guidelines. The appropriate activities will vary by community and depend on each community’s tsunami threat (e.g., tsunami sources) and vulnerability as determined by the local NWS Weather Forecast Office and the responsible TsunamiReady® Board in consultation with National Tsunami Hazard Mitigation Program partners and other tsunami experts, as needed.

For more information about the application process, see “How to Become TsunamiReady” at <https://www.weather.gov/tsunamiready/become>.

### **SUMMARY TABLE OF GUIDELINES**

MIT-1	Have designated and mapped tsunami hazard zones.
MIT-2	Include tsunami hazard and community vulnerability information in the community’s FEMA-approved multi-hazard mitigation plan.
MIT-3	Install signage, as needed, that identifies for example: (1) tsunami danger area and/or hazard zone (entering and leaving signs), evacuation routes, and assembly area; and (2) provides tsunami response education (go to high ground).
PREP-1	Produce easily understood tsunami evacuation maps as determined to be appropriate by local authorities.
PREP-2	Support an ongoing sustained tsunami public education effort. This effort should include the development and distribution of outreach materials.
PREP-3	Support an ongoing sustained tsunami education effort specific to public schools in coastal community pursuing TsunamiReady® recognition.
PREP-4	Hold at least one community-wide outreach or education activity annually.
PREP-5	Conduct community exercises that reinforce the concepts contained in PREP-1 through PREP-4.
PREP-6	Conduct evacuation drills for all public schools in the mapped tsunami evacuation zone to reinforce the concepts contained in PREP-1 through PREP-4.

## **SUMMARY TABLE OF GUIDELINES (continued)**

RESP-1	Address tsunami hazards in the community's emergency operations plan (EOP).
RESP-2	Address tsunami hazards in the emergency operations plans (EOP) for all public schools in the tsunami hazard zone.
RESP-3	Commit to supporting the emergency operations center (EOC) during tsunami incidents if an EOC is opened and activated.
RESP-4	Have redundant and reliable means for a 24-hour warning point (and EOC if activated) to receive official tsunami watch, advisory, and warning alerts.
RESP-5	Have redundant and reliable means for 24-hour warning point and/or EOC to disseminate official tsunami watch, advisory, and warning alerts to the public.
RESP-6	Have Public Alert-certified NOAA Weather Radio (NWR) receivers in critical facilities and public venues.
RESP-7	Conduct emergency operations plan exercises that test at least one component of the community's EOP or one item from RESP-4 through RESP-6.

## **MITIGATION (MIT)**

**MIT-1. Have designated and mapped tsunami hazard zones.** The primary source for mapping potential tsunami hazard zones is inundation modeling, which illustrates expected areas to be flooded by the tsunami. If models are unavailable, other acceptable sources include guidance from tsunami experts from NOAA, the U.S. Geological Survey, state geological surveys, universities, or consultants. Modeling and mapping efforts should meet NOAA/NTHMP guidelines.

*Note: for communities on the coasts of the Atlantic Ocean or Gulf of Mexico, a "baseline tsunami zone" has been prepared and, where observed, is approved to meet this requirement. SLOSH modeling is also approved for use for this purpose. Tsunami Hazard Zone maps are used by emergency managers for planning purposes and are different from, but related to, evacuation maps described in PREP-1.*

**MIT-2. Include tsunami hazard and community vulnerability information in the community's FEMA-approved multi-hazard mitigation plan.** As described in section 44CFR Part 201.6 (c)(2) of the Stafford Disaster Mitigation Act, this information should include, where available, the following:

- A tsunami-hazard profile, including source locations, extent of inundation, run-up or height that a wave reaches above sea level, previous tsunami occurrences, and likelihood of future tsunamis
- A description of community vulnerability, including areas exposed to inundation and an impact summary of the resident population and specific sub-populations of people expected to be affected (e.g., individuals with access and functional needs, visitors, seasonal workers), businesses, infrastructure, and critical facilities

Estimates of population exposure in tsunami evacuation zones should be based on local knowledge or on analysis of population data (e.g., Census), and can include ranges of population counts to recognize daily or seasonal fluctuations in workers, visitors, and temporary residents.

Communities that do not have resources to support development of a multi-hazard mitigation plan should work with the county where the community is located to be incorporated into the county's multi-hazard mitigation plan.

This requirement is met if there is a FEMA-approved multi-hazard mitigation plan that includes tsunamis.

**MIT-3. Install signage, as needed, that identifies for example: (1) tsunami danger area and/or hazard zone (entering and leaving signs), evacuation routes, and assembly area; and (2) provides tsunami response education (go to high ground).** Signage should be implemented according to state and local policies and as determined to be appropriate by local authorities, the responsible TsunamiReady® Board, and with possible assistance from partners. Wherever possible, signage should comply with specifications aimed at standardization so that all coastal communities eventually will have identical signage. Continuity of signage benefits domestic residents and international visitors. In cases where tribal law supersedes state laws, tribes should make every effort to try to be consistent with state codes while also maintaining their own tribal codes. Multi-hazard signs that include the tsunami hazard are adequate for this item.

## **PREPAREDNESS (PREP)**

**PREP-1. Produce easily understood tsunami evacuation maps as determined to be appropriate by local authorities** that depict tsunami evacuation routes and assembly areas (see MIT-1). Maps should be based on tsunami hazard zone mapping and in accordance with the community's emergency operations plan. Maps should be made available via appropriate print and/or digital media.

*Note: for communities on the coasts of the Atlantic Ocean or Gulf of Mexico, a "baseline tsunami hazard zone" has been prepared and, where observed, is approved to meet this guideline.*

**PREP-2. Support an ongoing sustained tsunami public education effort. This effort should include the development and distribution of outreach materials** that include, where appropriate, tsunami evacuation maps, evacuation routes, safety tips, and information about when and how to respond to warnings (including natural warnings for regions with a local tsunami threat). They should be tailored to meet local information needs and be based on location-specific tsunami threats. Distribution should use three or more wide-reaching diverse methods, including, but not limited to:

- Brochures and flyers distributed at public venues and/or bulk mailed to local residents and businesses
- Newspaper inserts

- Public utility/service industry bill safety notices
- Local faith-based and civic organization bulletins/mailings
- Local radio and television
- Billboard, roadside, highway, or educational signs
- Historical markers and interpretative signs
- Websites/social media
- Bulk email

Possible physical locations for distribution of materials include:

- Visitor centers and local tourist businesses (e.g., restaurants, bars)
- Hotels, motels, and campgrounds where visitors to beach areas stay
- Public libraries
- Community centers
- Recreation centers
- Kiosks or information centers in places where the public visits (e.g., malls, stores, etc.)
- Child care centers

**PREP-3. Support an ongoing sustained tsunami education effort specific to public schools in coastal community pursuing TsunamiReady® recognition.** This effort can leverage the outreach materials from PREP-2 but should also be augmented if needed to cover tsunami threats specific to any given school. Distribution can be through existing state, regional, or local educational governing bodies but cover letters transmitting materials should be included that provide schools with a means to get support from the responsible TsunamiReady® Board. Distribution to all schools in the tsunami hazard zone should occur for initial TsunamiReady® recognition and then again every three years. At the discretion of the responsible TsunamiReady® Board, and to address the cases where the tsunami hazard zone represents a very small percentage of total area of the community, the distribution can be limited to schools that are in or near the tsunami hazard zone. This applies to both the initial and periodic distribution. This distribution should also occur for private schools when possible.

**PREP-4. Hold at least one community-wide outreach or education activity annually** to educate community residents, businesses, and visitors, with an emphasis on those in the tsunami hazard zone, on tsunami hazards, evacuation routes, how warning information will be received (including natural warnings for regions with a local tsunami threat), safety, and response. These activities may be multi-hazard as long as they include tsunamis in the content. The number of activities required for a given community is to be determined by the responsible TsunamiReady® Board but will generally include at least one community-wide event and/or multiple smaller scale events.

Acceptable activities include, but are not limited to:

- Leveraging of national, state, and regional campaigns through use of social media
- Multi-hazard events or presentations
- Adding on to *The Great Shakeout* drills and practice
- Booths at community events and county fairs
- Community tsunami safety workshops, town halls, or similar public meetings

- Presentations or workshops for faith-based organizations, community or civic groups
- Local public safety campaigns, such as “Tsunami Preparedness” week/month
- Local business workshops to help them develop response and business continuity plans
- Information for business owners for employee training, outreach, or education that targets high-occupancy businesses in tsunami hazard zones (e.g., hotels, restaurants, fisheries, industrial sites)
- Door-to-door safety campaigns targeted to residents and businesses who live or work in the community’s tsunami hazard zone

**PREP-5. Conduct community exercises that reinforce the concepts contained in PREP-1 through PREP-4.** The exercises can focus solely on the tsunami hazard or can be a multi-hazard exercise that also addresses the tsunami hazard. One exercise should be conducted for initial Tsunami Ready recognition and then at least one other should be conducted within the three-year period following recognition. The exercises could be tabletop, functional, or full-scale.

**PREP-6. Conduct evacuation drills for all public schools in the mapped tsunami evacuation zone to reinforce the concepts contained in PREP-1 through PREP-4.** Evacuation drills should be conducted annually but can be conducted as part of a multi-hazard drill (for example, combined with a fire evacuation drill). Private schools in the tsunami evacuation zone should be encouraged to also conduct annual evacuation drills.

## **RESPONSE (RESP)**

**RESP–1. Address tsunami hazards in the community’s emergency operations plan (EOP).** If a community-level plan does not exist, other acceptable plans include a countywide EOP or a state or local comprehensive emergency management plan. To meet this requirement, plans should:

- Identify tsunami as a hazard and provide a risk assessment
- Detail 24-hour warning point procedures relating to tsunamis
- Specify emergency operations center activation criteria and staffing expectations
- Specify tsunami criteria and procedures for the activation of the public warning system in its area of responsibility
  - Criteria and procedures for siren activation, cable television override, and/or local activation in accordance with state EAS plans, warning fan-out procedures, and communication to functional and access needs populations
- Provide contact information for all jurisdictional agencies and response partners, including the NWS
- Include evacuation plans for tsunamis, roles of community entities/agencies, tsunami hazard zone maps with evacuation routes, and protocols for access and functional needs populations
- Include procedures for updating information and determining when to advise it is safe for (1) emergency response personnel to enter the evacuated zones, and (2) when it is safe for the public to return to homes and businesses in the evacuated zone(s)
- Include procedures for providing security for the evacuated zone(s)
- Include procedures for reporting tsunami impacts in the community

**RESP-2. Address tsunami hazards in the emergency operations plans (EOP) for all public schools in the tsunami hazard zone,** or have a section in community's emergency operations plan (EOP), from RESP-1, that addresses emergency operations for public schools in the community. Encourage this for private schools.

**RESP-3. Commit to supporting the emergency operations center (EOC) during tsunami incidents if an EOC is opened and activated.** Ensure that the EOC can execute tsunami warning functions (public notifications) based on predetermined guidelines related to NWS tsunami information and/or tsunami incidents.

*Note: this applies only for communities with a year-round population of 15,000 or more. For communities with less than a 15,000 year-round population, there must be ties to an EOC serving that community.*

- Has 24-hour operations or plan to activate an EOC for tsunami incidents in accordance with the EOP
- Has warning reception and dissemination capability
- Has the ability and authority to activate the public warning system in its area of responsibility
- Maintains the ability to communicate within and across jurisdictions (e.g., with other EOCs, including those maintained by private organizations, incident command posts, etc.); communication capabilities should be equal to or better than the communication/dispatch center
- Maintains established communication links with NWS (e.g., NWSChat, phone, etc.) to relay real-time weather and flood reports to support the warning decision making process

**RESP-4. Have redundant and reliable means for a 24-hour warning point (and EOC if activated) to receive official tsunami watch, advisory, and warning alerts** from NOAA Tsunami Warning Centers, local NWS Offices, or other officially recognized U.S.-based agencies such as state and local emergency management agencies. Alerts must be able to reach the 24-hour warning point by at least three of the following:

- Public Alert-certified NOAA Weather Radio (NWR) receiver: ***Required for recognition only if within reliable reception range of a NWR transmitter***
- Statewide warning fan-out notification system (documented in writing with backup indicated)
- NOAAPORT receiving station
- National Warning System (NAWAS) drop: FEMA-controlled, 24-hour, continuous-private-line telephone system used to convey warnings to federal, state and local governments, as well as the military and civilian population
- NWSChat: An instant messaging program available via the Internet used by NWS operational personnel to share critical warning decision expertise and other significant weather information
- Emergency Management Weather Information Network (EMWIN) receiver: Device that receives satellite feed and/or VHF radio transmission of NWS products

- Statewide telecommunications system: Automatic relay of NWS products, usually on law enforcement systems
- California Integrated Seismic Network (CISN) Display Program
- Amateur Radio transceiver: Potential communications directly to NWS office
- Alerts provided through a third-party provider: Typically received via phone, email and/or a texting service to a smartphone, tablet, or computer
- Local Radio: Emergency Alert System, LP1/LP2
- Active Internet monitoring capability, including social media such as Facebook and Twitter
- NOAA Weather Wire drop: Satellite downlink data feed from NWS
- Direct email from Tsunami Warning Center
- Direct fax from Tsunami Warning Center
- Text message or direct pager message from Tsunami Warning Center
- U.S. Coast Guard (USCG) broadcasts: warning point monitoring of USCG marine channels
- Other communications channel (e.g., active participation in a state-run warning network, two-way, local emergency responder radio network, etc.), please explain

*Note: Wireless Emergency Alerts (WEA) are NOT included as a means of receiving tsunami alerts because WEA is only activated for the first tsunami warning and not for other levels of alerts (Tsunami Advisory, Tsunami Watch, Tsunami Information Statement). Also, WEA does not work everywhere.*

**RESP-5. Have redundant and reliable means for 24-hour warning point and/or EOC to disseminate official tsunami watch, advisory, and warning alerts to the public.** Alerts must be able to be disseminated from the 24-hour Warning Point and/or EOC through at least three of the following methods:

- Emergency Alert System (EAS) message initiation and broadcast
- Cable television audio/video overrides
- Local flood warning systems ideally with no single point of failure
- Plan for siren/megaphone notification on emergency vehicles
- Outdoor warning sirens
- Other local alert broadcast system
- Local pager/texting system
- Amateur radio operator network (ham radio)
- Telephone mass notification system
- Telephone tree to critical facilities
- Coordinated jurisdiction-wide radio network
- For counties, parishes, boroughs, etc., a countywide communications network that ensures the flow of information between all cities and towns within its borders, including acting as the surrogate warning point and/or EOC for communities without those capabilities
- Social media usage (Twitter, Facebook, etc.)
- Lifeguards on beaches and on patrol
- Other, please explain

All response requirements should recognize that during a local tsunami event, initial response would be performed primarily by at-risk individuals. Individuals in local tsunamis, including emergency personnel, will need to take personal responsibility for evacuating after recognizing the natural warnings or environmental cues of a possible or imminent tsunami (e.g., ground shaking from an earthquake, unusual rapid rise or fall of a shoreline). Official communications and warnings may be difficult to perform given the potential for infrastructure and telecommunication damage from the preceding earthquake and the limited time between the generation and arrival of the first wave in the tsunami.

**RESP-6. Have Public Alert-certified NOAA Weather Radio (NWR) receivers in critical facilities and public venues** in and around the tsunami evacuation zone (where reception is available), including:

**Required locations:**

- Communication/dispatch center serving as the 24-hour warning point
- EOC or standby location (such as a conference room) that will become a defacto EOC, if designated
- City hall, county courthouse, or similar local elected executive office building
- Public school superintendent's office—for all public school jurisdiction(s) in tsunami evacuation zones

**Recommended, but not required, locations:**

- Courthouses
- Public school superintendent's office—for all public school jurisdiction(s) in tsunami hazard zones (different from tsunami evacuation zone under "required" above)
- Private school headmaster's (or equivalent) office—for all private schools with a student population exceeding 100
- Public libraries
- Recreation centers
- Community centers
- Hospitals
- All schools, usually located in principal's or designee's office
- Childcare centers
- Fairgrounds, parks and recreation areas\*
- Public utilities\*
- Large-event venues, e.g., arenas, stadiums, etc.\*
- Transportation departments\*
- Nursing homes/assisted living facilities\*
- Harbor masters' offices
- Life guard towers

*\*Note: usually, the NWR receivers would be located in the primary management office/facility that is accessible 24/7 (where appropriate) and has the authority to alter operations and the*

*ability to order protective actions based on the NWS hazardous weather or flood warning received.*

**RESP-7. Conduct emergency operations plan exercises that test at least one component of the community's EOP or one item from RESP-4 through RESP-6.** These exercises can be part of a multi-hazard exercise and/or can be part of an exercise that satisfies the PREP-5 requirement to conduct a community exercise. One exercise should be conducted for initial Tsunami Ready recognition and at least one other should be conducted within the three-year period following recognition. The exercises could be tabletop, functional, or full-scale.

For recommendations about additional activities to supplement TsunamiReady efforts, see "TsunamiReady Guidelines: Tier Two" and "Other Recommended Efforts to Increase Community Resilience," which are available at <https://www.weather.gov/tsunamiready/become>.