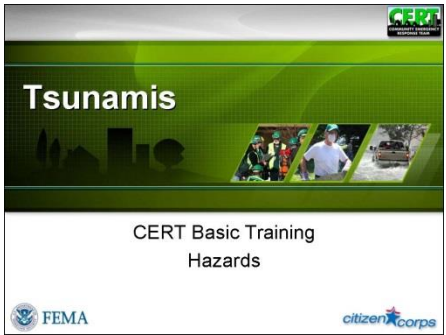
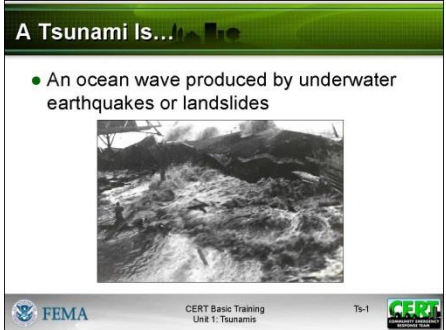
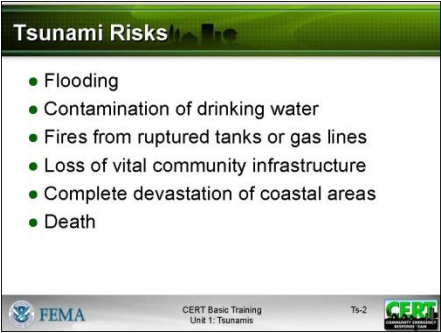
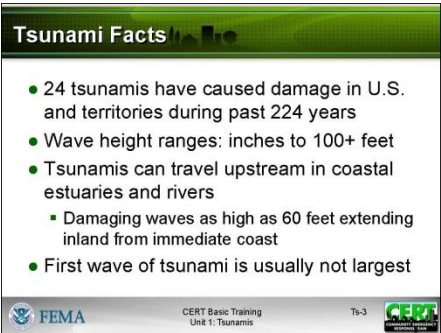


# Tsunamis


INSTRUCTOR GUIDANCE	CONTENT
 <p><b>Tsunamis</b></p> <p>CERT Basic Training Hazards</p> <p>FEMA citizen corps</p> <p><b>Display Slide Ts-0</b></p>  <p><b>A Tsunami Is...</b></p> <ul style="list-style-type: none"><li>• An ocean wave produced by underwater earthquakes or landslides</li></ul> <p>FEMA CERT Basic Training Unit 1: Tsunamis Ts-1</p> <p><b>Display Slide Ts-1</b></p>	<p><b><i>Tsunamis</i></b></p> <p>Tell the participants that <u>tsunamis</u> are ocean waves that are produced by underwater earthquakes or landslides. The word is Japanese and means “harbor wave” because of the devastating effects that these waves have had on low-lying Japanese coastal communities. Tsunamis are often incorrectly referred to as tidal waves.</p>

**COMMUNITY EMERGENCY RESPONSE TEAM  
TSUNAMIS**

INSTRUCTOR GUIDANCE	CONTENT
<div data-bbox="237 453 675 783">  <p><b>Tsunami Risks</b></p> <ul style="list-style-type: none"> <li>● Flooding</li> <li>● Contamination of drinking water</li> <li>● Fires from ruptured tanks or gas lines</li> <li>● Loss of vital community infrastructure</li> <li>● Complete devastation of coastal areas</li> <li>● Death</li> </ul> <p>FEMA CERT Basic Training Unit 1: Tsunamis Ts-2</p> </div> <p><b>Display Slide Ts-2</b></p> <div data-bbox="237 1003 675 1333">  <p><b>Tsunami Facts</b></p> <ul style="list-style-type: none"> <li>● 24 tsunamis have caused damage in U.S. and territories during past 224 years</li> <li>● Wave height ranges: inches to 100+ feet</li> <li>● Tsunamis can travel upstream in coastal estuaries and rivers <ul style="list-style-type: none"> <li>■ Damaging waves as high as 60 feet extending inland from immediate coast</li> </ul> </li> <li>● First wave of tsunami is usually not largest</li> </ul> <p>FEMA CERT Basic Training Unit 1: Tsunamis Ts-3</p> </div> <p><b>Display Slide Ts-3</b></p>	<p><b>Risk Posed by Tsunamis</b></p> <p>Explain that tsunamis pose the greatest risk to areas less than 25 feet above sea level and within one mile of the shoreline. They can cause:</p> <ul style="list-style-type: none"> <li>■ Flooding</li> <li>■ Contamination of drinking water</li> <li>■ Fires from ruptured tanks or gas lines</li> <li>■ Loss of vital community infrastructure</li> <li>■ Complete devastation of coastal areas</li> <li>■ Death</li> </ul> <p>Stress that <u>most deaths caused by tsunamis result from drowning.</u></p> <p>Tell the group that since 1945, six tsunamis have killed more than 350 people and caused 500 million dollars worth of property damage in Hawaii, Alaska, and the West Coast. In the United States and its territories, 24 tsunamis have caused damage during the past 224 years.</p> <p>Point out that the common scientific definition of tsunami wave height ranges between a few inches and about 100 feet (30 meters). Some tsunamis have produced wave heights of up to 200 feet (60 meters), for example, the 1964 Alaska subduction earthquake. Tsunamis can travel upstream in coastal estuaries and rivers, with damaging waves as high as sixty feet extending farther inland than the immediate coast. A tsunami can occur during any season of the year and at any time, day or night.</p>

**COMMUNITY EMERGENCY RESPONSE TEAM  
TSUNAMIS**

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INSTRUCTOR GUIDANCE	CONTENT
 <p>Allow the participants time to respond.</p>	<p>Explain that the first wave of a tsunami is usually not the largest in a series of waves, nor is it the most significant. One coastal community may experience no damaging waves, while another, not far away, may experience destructive deadly waves. Depending on a number of factors, some low-lying areas could experience severe inundation of water and debris several miles or more inland.</p> <p>Tell the participants that tsunami warnings originate from two agencies:</p> <ul style="list-style-type: none"><li>▪ <u>The West Coast/Alaska Tsunami Warning Center (WC/ATWC)</u> is responsible for tsunami warnings for California, Oregon, Washington, British Columbia, and Alaska.</li><li>▪ <u>The Pacific Tsunami Warning Center (PTWC)</u> is responsible for providing warnings to international authorities, Hawaii, and U.S. territories within the Pacific basin.</li></ul> <p>Point out that the two Tsunami Warning Centers coordinate the information that is being disseminated.</p> <p><b>Tsunami Preparedness</b></p> <p><b>How can you prepare for a tsunami?</b></p>



**COMMUNITY EMERGENCY RESPONSE TEAM  
TSUNAMIS**


INSTRUCTOR GUIDANCE	CONTENT
<div data-bbox="240 394 675 722"> </div> <p data-bbox="240 758 513 793"><b>Display Slide Ts-5</b></p> <div data-bbox="240 867 315 940"> </div> <p data-bbox="240 974 646 1045">Allow the participants time to respond.</p> <div data-bbox="240 1083 675 1411"> </div> <p data-bbox="240 1446 513 1482"><b>Display Slide Ts-6</b></p> <div data-bbox="240 1627 315 1701"> </div> <p data-bbox="240 1734 565 1806">Allow the group time to respond.</p>	<p data-bbox="706 363 1365 396">Suggest the following ways to protect property:</p> <ul data-bbox="706 415 1511 810" style="list-style-type: none"> <li>▪ <u>Avoid building or living in buildings within several hundred feet of the coastline.</u> These areas are most likely to experience damage from tsunamis, strong winds, or coastal storms.</li> <li>▪ <u>Elevate coastal homes.</u> Most tsunami waves are less than 10 feet high.</li> <li>▪ <u>Consult with a professional</u> for advice about ways to make your home more resistant to tsunami. Also, there may be ways to divert waves away from your property.</li> </ul> <p data-bbox="706 863 1357 934"><b>What do you do if you feel a strong coastal earthquake?</b></p> <p data-bbox="706 1087 1511 1159">Use the slide to explain the actions that they should take. Be sure to emphasize the following points:</p> <ul data-bbox="706 1178 1511 1572" style="list-style-type: none"> <li>▪ <u>Drop, cover, and hold.</u> You should protect yourself from the earthquake first.</li> <li>▪ <u>When the shaking stops, gather your family members and evacuate quickly.</u> Leave everything else behind. <u>A tsunami could occur within minutes.</u> Move quickly to higher ground away from the coast, up to two miles inland.</li> <li>▪ <u>Avoid downed power lines, and stay away from buildings and bridges from which heavy objects might fall during an aftershock.</u></li> </ul> <p data-bbox="706 1625 1451 1696"><b>What should you do when you receive a Tsunami Warning?</b></p>

**COMMUNITY EMERGENCY RESPONSE TEAM  
TSUNAMIS**

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INSTRUCTOR GUIDANCE	CONTENT
<div data-bbox="240 359 673 688"><p><b>If a Warning is Issued</b></p><ul style="list-style-type: none"><li>● If in tsunami risk area, evacuate immediately</li><li>● Follow instructions issued by local authorities</li><li>● Get to higher ground as far inland as possible</li><li>● Listen to NOAA Weather Radio or Coast Guard emergency frequency station</li><li>● Return home only after local officials tell you that it is safe</li><li>● If already out on ocean, be sure to get as far from coast as possible</li></ul><p><small>FEMA CERT Basic Training Unit 1: Tsunamis Ts-7</small></p></div> <p><b>Display Slide Ts-7</b></p> <p>Emphasize that watching a tsunami from the beach or cliffs can put people in grave danger. If a person can see the wave, he or she is too close to escape it.</p>	<p>Use the slide to summarize the discussion. Discuss the following actions:</p> <ul style="list-style-type: none"><li>▪ If you are in a tsunami risk area and you hear an official tsunami warning or detect signs of a tsunami, <u>evacuate at once</u>. A tsunami warning is issued when authorities are certain that a tsunami threat exists, and there may be little time to get out.</li><li>▪ <u>Follow instructions issued by local authorities</u>. Recommended evacuation routes may be different from the one you planned, or you may be advised to move to higher ground than you had planned.</li><li>▪ <u>Get to higher ground as far inland as possible</u>. Officials cannot reliably predict either the height or local effects of tsunamis.</li><li>▪ <u>Listen to a NOAA Weather Radio or Coast Guard emergency frequency station</u> for updated emergency information.</li><li>▪ <u>Return home only after local officials tell you that it is safe</u>. A tsunami is a series of waves that may continue for hours. Do not assume that after one wave, the danger is over. The next wave may be larger than the first one.</li><li>▪ <u>If you are out on a boat when the warning is issued, move as far out from the coast as possible</u>. This action could prevent the waves from carrying your craft inland where it is likely to sustain damage and the risk of fatality is great.</li></ul>

**COMMUNITY EMERGENCY RESPONSE TEAM  
TSUNAMIS**

INSTRUCTOR GUIDANCE	CONTENT
 <p><b>PM, P. Ts-5</b></p>	<p>Explain that, following a tsunami, citizens should continue listening to a NOAA Weather Radio or Coast Guard emergency frequency station for updated emergency information and instructions. As with many other hazards, post-tsunami actions include:</p> <ul style="list-style-type: none"> <li>▪ <u>Avoiding fallen power lines or broken utility lines</u> and immediately reporting those that you see</li> <li>▪ <u>Staying out of damaged areas</u> until told that it is safe to enter. The risk of contamination and disease is very high</li> <li>▪ <u>Staying out of damaged buildings</u></li> <li>▪ <u>Using a flashlight to look for damage</u> and fire hazards, and documenting damage for insurance purposes</li> <li>▪ <u>Turning off utilities</u>, if necessary</li> <li>▪ <u>Reserving the telephone</u> for emergencies</li> </ul> <p><b>Does anyone have additional questions, comments, or concerns about tsunamis or tsunami preparedness and response?</b></p> <p>Refer the participants to <i>Tsunami Myths and Facts</i> in the Participant Manual. Suggest that they review these myths and facts after the session.</p>

**COMMUNITY EMERGENCY RESPONSE TEAM  
TSUNAMIS**

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<b>PM, P. Ts-5</b>	<b>Tsunami Myths and Facts</b>
<b>Myth:</b>	<b>Tsunamis are giant walls of water.</b>
<b>Fact:</b>	Tsunamis normally have the appearance of a fast-rising and receding flood. They can be similar to a tide cycle occurring over 10-60 minutes instead of 12 hours. Occasionally, tsunamis can form walls of water, known as tsunami bores, when the waves are high enough and the shoreline configuration is appropriate.
<b>Myth:</b>	<b>Tsunamis are a single wave.</b>
<b>Fact:</b>	Tsunamis are a series of waves. Often the initial wave is not the largest. The largest wave may occur several hours after the initial activity has started at a coastal location.
<b>Myth:</b>	<b>Boats should seek protection of a bay or harbor during a tsunami.</b>
<b>Fact:</b>	Tsunamis are often most destructive in bays and harbors. Tsunamis are least destructive in deep, open ocean waters. Boats already out to sea should travel as far out as possible to prevent being carried to shore.