

WHAT TO KNOW ABOUT TSUNAMIS

Tsunami Dangers

A tsunami is a series of waves, usually caused by an earthquake beneath the sea floor. As tsunamis enter shallow water near land, they increase in height and can cause great loss of life and property damage.

For boaters, tsunami dangers also include:

- Sudden water-level fluctuations
- Grounding of vessels as water level suddenly drops
- Capsizing from incoming surges (bores), complex coastal waves and surges hitting grounded boats
- Strong and unpredictable currents that can change direction quickly
- Eddies/whirlpools
- Drag on large-keeled boats
- Collision with other boats, docks, and debris

Tsunami Types and Warnings

LOCAL TSUNAMIS are caused by great earthquakes near the Oregon coast and will strike in 10 to 30 minutes. The earthquake is the warning for a local tsunami. Be alert for natural warning signs:

- Onshore
 - Strong ground shaking for minutes
 - Loud ocean roar
 - Water receding unusually far, exposing the sea floor
 - Water surging onshore faster than any tide
- Offshore
 - You may feel the earthquake through the hull of your boat
 - You could see a rapid and extreme shift in currents and simultaneous changes in wind wave heights

Smaller **DISTANT TSUNAMIS** are caused by great earthquakes far away from the Oregon coast and will strike four hours or more after the earthquake. Be alert for warning statements and natural warning signs:

- Sign up to receive notifications from the National Tsunami Warning Center, which issues two types of warnings for Oregon boaters:
 - **Advisories:** Peak tsunami wave heights of 1 to 3 feet are expected, indicating strong and dangerous currents can be produced in harbors
 - **Warnings:** Tsunami wave heights could exceed 3 feet, indicating very strong, dangerous currents and inundation of dry land is anticipated
- Contact your harbormaster or emergency services office to find out what notifications you can sign up for locally
- Listen for warnings from sirens or announcements from airplanes and from the media
- Heed natural warnings such as a loud ocean roar or rapid changes in sea level or currents

Tsunamis Can Trick You

- The first surge may not be the last or the largest
- It is not unusual for tsunami surges to continue for 12 hours
- Dangerous currents can persist in harbors for 60 hours or more
- The National Tsunami Warning Center forecasts how long dangerous conditions persist

WHAT TO DO TO PREPARE

Are you prepared for a great earthquake and tsunami to strike, rendering ports, fuel supplies, and other infrastructure inaccessible?

For more information on how to better prepare, check with:

- Harbor masters and port captains
- US Coast Guard contacts
- State and local emergency managers
- National Tsunami Warning Center:
www.wcatwc.arh.noaa.gov
- Oregon Department of Geology and Mineral Industries – download evacuation maps:
www.oregontsunami.org
- National Weather Service – sign up for alerts:
www.weather.gov/emailupdates/
- Weather Forecast Offices:
 - Medford www.wrh.noaa.gov/mfr/
 - Portland www.wrh.noaa.gov/pqr/
- Oregon Emergency Management:
www.oregon.gov/OMD/OEM/
- NOAA: www.tsunami.gov
- Federal Emergency Management Agency:
www.ready.gov/tsunamis
- Centers for Disease Control:
www.bt.cdc.gov/disasters/tsunamis
- Red Cross: www.redcross.org



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TSUNAMI!

WHAT OREGON

BOAT OWNERS

NEED TO KNOW



Port of Brookings, Ore., following wave surges from the March 11, 2011 tsunami off the coast of Japan. Photo: Jamie Francis/The Oregonian



Marina damage near Chetco River, Ore., following wave surges from the March 11, 2011 tsunami off the coast of Japan. Photo: U.S. Coast Guard



If you are on the water and a tsunami is coming, how far offshore should you take your boat?

Minimum safe distance offshore for local tsunamis: 100 fathoms

Minimum safe distance offshore for distant tsunamis: 30 fathoms

Nautical Miles 40 20 0
Miles 40 20 0

Astoria
Seaside
Cannon Beach
Manzanita
Rockaway Beach
Tillamook

Pacific City
Lincoln City
Depoe Bay
Newport
Waldport
Yachats

Florence
Reedsport
Coos Bay

Bandon
Port Orford

Gold Beach

Brookings

WHAT TO DO WHEN A TSUNAMI STRIKES

What to do depends on what type of tsunami occurred and where you are

Distant Tsunamis

You generally have at least 4 hours after the distant earthquake to take action.

If you are on the water

- Check with the US Coast Guard (USCG) before taking any action. If advised that offshore evacuation is an option and this option looks practical for your vessel, proceed to a staging area **greater than 30 fathoms (180 ft)**. If conditions do not permit, dock your boat and get out of the tsunami evacuation zone.

If you are on land or tied up at the dock

- Your choices are to a) evacuate out to sea beyond 30 fathoms, b) leave your vessel and evacuate out of the distant tsunami inundation zone, or c) go upriver. DO YOUR HOMEWORK before the event to understand how practical these options are for the largest distant tsunamis that might strike your area. Check with local authorities and www.oregontsunami.org for information.
- Check with local authorities before taking any action. Most distant tsunamis are small enough that it is safer to keep your boat docked. Congestion in the waterway or among those trying to pull boats out with trailers can create serious problems. Sea and weather conditions may be more dangerous than the tsunami! Get yourself out of the tsunami evacuation zone.

After the tsunami

- If in an offshore staging area**, check with the USCG for guidance before leaving the staging area; conserve fuel by drifting until you know what actions you need to take.
- If in an onshore assembly area**, check with local authorities for guidance before returning to the inundation zone.

BROADCASTS DURING A TSUNAMI EVENT

USCG will issue Urgent Marine Information Broadcasts on CH 16, and additional information will be available from NOAA Weather Radio.

Local Tsunamis

You have only ~10 minutes to take action, so have a plan ahead of time that includes a quick way to release commercial fishing gear so your boat is not dragged down by currents; have least 3 days of food, fuel and water.

If you are on the water

- At less than 100 fathoms (600 ft):** (1) Stop commercial fishing operations immediately, (2) free the vessel from any bottom attachment (cut lines if necessary), and (3) if you can beach or dock your boat and evacuate on foot within 10 minutes of a natural warning, then this is your best chance. If that is not possible, head to greater than 100 fathoms, keeping in mind the following:
 - Proceed as perpendicular to shore as possible.
 - Sail directly into wind waves, keeping in mind that wind waves opposed by tsunami currents will be greatly amplified.
 - Maintain as much separation as possible from other vessels.
 - Synchronize movements with other vessels to avoid collisions.
- At greater than 100 fathoms:** If you are in deep water but not quite 100 fathoms, head to deeper water. If you are already at greater than 100 fathoms, then you are relatively safe from tsunamis, but deeper water is safer from tsunami currents and the amplification of wind waves by those currents.

If you are on land or tied up at dock

- Evacuate out of the tsunami evacuation zone.** You don't have time to save your boat and could die if you try to do so.

After the tsunami

- If in an offshore staging area**, check with the USCG for guidance before leaving the staging area; conserve fuel by drifting until you know what actions you need to take.
- If in an onshore assembly area**, check with local authorities for guidance before returning to the inundation zone.
- Do not return to local ports** until you have firm guidance from USCG and local authorities.
 - Local ports will sustain heavy damage from a local tsunami and may not be safe for days, weeks or months.
 - If at sea, check to see if you can reach an undamaged port with your current fuel supply and watch for floating debris or survivors that may have been washed out on debris.
 - If at sea, consider checking with USCG about your role in response and recovery.