How should boat owners **PREPARE** for tsunamis?

Prior to arrival of the March 11, 2011 tsunami along the California coast, many boat owners took their boats offshore without adequate supplies or knowledge of how long they would need to stay offshore. As a result, boaters tried to re-enter harbors too early, while dangerous tsunami conditions still existed. They put themselves and harbor personnel at risk of injury and death.

Before you plan to leave safe harbor, consider the following:

- Talk to the Harbor Master or related officials to learn about your harbor's tsunami safety protocols.
- Sign up to receive tsunami alerts from NOAA and emergency calls from your Harbor Master or local emergency services office.
- · Know weather conditions out on the ocean.
- Know how long it takes your boat to get to deep water. The 30-fathom line is the NOAA recommendation.
- · Have adequate supplies: water, shelter, food, and fuel to remain at sea for 24 hrs or more.
- · Have a family plan for tsunamis in place so you know your family will be safe.

If you do not have these essential preparedness items, DO NOT attempt to take your boat offshore. Secure your boat to the dock and leave the dock area before the tsunami arrives.



Boat attempting to leave Crescent City Harbor during the March 11, 2011 tsunami

Other resources for tsunami information in California

State of California Tsunami Program (California Geological Survey website): www.tsunami.ca.gov

California Office of Emergency Services Earthquake and Tsunami Program: http://caloes.ca.gov/cal-oesdivisions/earthquake-tsunami-volcanoprograms/tsunami-about

National Oceanic and Atmospheric (NOAA) Administration – National Weather Service Weather Forecast Offices: Eureka - www.wrh.noaa.gov/eka SF Bay/Monterey – www.wrh.noaa.gov/mtr Los Angeles/Oxnard - www.wrh.noaa.gov/lox San Diego - www.wrh.noaa.gov/sgx

Federal Emergency Management Agency: www.ready.gov/tsunamis

Redwood Coast Tsunami Work Group/ Humboldt **State University:** www.humboldt.edu/rctwg

California Harbor Master and Port Captain Association: www.harbormaster.org

Marine Recreation Association: www.marina.org

CA Boating Safety Officers Association: www.cbsoa.org

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TSUNAMIS

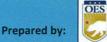
What **BOATERS** should know



The March 11, 2011 tsunami in Santa Cruz Harbor



Crescent City Harbor after the March 11, 2011 tsunami









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What is a **TSUNAMI**?

A tsunami is a series of water surges usually caused by an earthquake beneath the sea floor. These can cause strong, dangerous currents inside harbors and bays.

TSUNAMIS CAN TRICK YOU!

- The first surge may not be the largest.
- It is not unusual for tsunami surges to continue for 12 hours and in some cases much longer.
- · Just when you think it is all over, another very large surge may come.



2 Ways to Know if a Tsunami is Coming:

Natural Warnings

On shore: GROUND SHAKING, a LOUD OCEAN ROAR, or the WATER RECEDING UNUSUALLY FAR exposing the sea floor.

On the water: You may still feel the earthquake rapid and extreme shift to an outgoing tide.

Official Warnings

On shore: You may hear an outdoor siren or you can receive a call from your harbor master or

or Warning on your marine VHF radio's CHANNEL 16 or weather frequency (as long as your radio has the Alert feature).

Natural Warning



The natural warnings described to the left indicate that a tsunami could arrive within minutes. Your response depends on where you are:

If you are on land or tied up at the dock: Leave your boat and go to high ground on foot as soon as possible. You don't have time to save your boat in this situation and could die if you try to do so.

If you are on the water but very near shore: If you can beach or dock your boat and get to high ground on foot within ten minutes of a Natural not possible, head to deep water as quickly as possible.

(180 feet) then you are safe from tsunamis. If you are in deep water but not quite 30 fathoms, head to deeper water.

There are a number of TSUNAMI HAZARDS that could affect boats/boaters:

- Sudden water-level fluctuations
- Boats that hit bottom as water level drops
- Strong and unpredictable currents
- Tsunami bores and amplified waves
- Eddies/whirlpools .
- Drag on large keeled boats
- Collision with other boats, docks, and debris

Official Warning

The National Weather Service, provides tsunami information for California boaters:

- ADVISORIES Peak tsunami wave heights between 1-3 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

Should you take your **boat OFFSHORE?**

The answer to this question depends on:

- The SIZE of the tsunami.
- How much TIME you have.
- 3) The PREPAREDNESS of the boat and its captain (see back).
- 4) The WEATHER at sea could be as dangerous as the tsunami itself.

Your Harbor Master or Port Captain may provide the best advice. For most harbors in California, it is safer to keep your boat docked during a tsunami because most tsunamis are relatively small. On the taking their boat offshore using the criteria above. Do not go offshore unless you are very sure that you can get to 30 fathoms (180 feet) before the tsunami arrives.

boat ramps and remember that you have to get your boat to the trailer, out of the water, and out of the tsunami zone before the tsunami arrives.