

THE EARTHQUAKE-TSUNAMI SURVIVAL GUIDE FOR RESIDENTS OF PACIFIC NORTHWEST COASTAL COMMUNITIES

The ground shaking will strike every Pacific Northwest coastal community from northern California to British Columbia. Ten to twenty-five minutes after the ground shaking starts, the first plateau of seventy- to eighty-foot high onshore tsunami waves will cover large portions of these coastal communities. One enormous plateau of tsunami waves will follow another onshore for up to eighteen hours. Evacuees will be isolated for the next twenty to thirty days, experiencing shortages of food, safe water, shelter and medical supplies.

It sounds like a science-fiction, but isn't. There is nearly a forty percent probability this disaster will happen at any time during the next fifty years, according to geoscientists, state and federal officials. Some say it is already overdue. It will be very different from the conditions caused by distant tsunamis arriving from Japan, Alaska, Chile or Russia. There will be no tsunami siren. There will not be an hour to evacuate. Roads, water, sewer mains and propane tanks will rupture, causing fires and minor flooding before the tsunami arrives. Foot travel will be the only way to reach a one hundred foot safe elevation.

“The earthquake that generated the great Indian Ocean tsunami of 2004 is estimated to have released the energy of 23,000 Hiroshima-type atomic bombs, according to the U.S. Geological Survey (USGS).” (Nat Geo., The Deadliest Tsunami in History? Jan 7, 2005). This is equivalent to the magnitude 9.0 plus undersea earthquakes that have happened along the Pacific Northwest Coast, generating the huge plateaus of tsunamis waves.

Knowing how to prepare for this disaster and what to do may make the difference in saving your life.

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Your Best Emergency Tool is a Positive, Well-prepared, Focused Mind. It is knowing clearly what you will do by mentally and actively rehearsing it. This will increase the simplicity and mental calm of your effort during an actual disaster and afterward.

A Primary Part of Disaster Preparedness is a Go-bag. It is a part of everyday life in locales prone to earthquakes, hurricanes, tornadoes, or tsunamis. The Go-bag is simply a medium backpack and rain cover containing lightweight weather appropriate clothing, illumination, food, safe water, shelter and a few other items. During the winter in Oregon the Go-bag might include the following:

Gear	Suggested Weights
Backpack/rain cover	56 oz.
rain jacket	11 oz.
rain pants	7 oz.
2 base-layer shirts, 1 base-layer pair of pants	28 oz.
1 mid-layer synthetic jacket and vest	22 oz.
1 mid-layer synthetic pant	8 oz.
hat, gloves, 2 pair socks	4 oz.
pocket knife, whistle, washcloth, 50' of paracord	16 oz.
headlamp, flint and steel fire-striker, cotton balls, paraffin	9 oz.
1 liter plastic BPA-free water bottle, mug-pot, purification tablets	8 oz.
sm. baggie of baking soda	1 oz.
1 Siltarp	16 oz.
30 one-a-day vitamins and ¾ lb. protein powder	19 oz.
(in winter only: a lightweight isobutene stove and 500g fuel canister)	24 oz.

Approximate Weight

205 to 229oz. (12. 8 lbs. to 14.3 lbs.)

Should you ordinarily use prosthetics or medications such as hearing aids, eyeglasses, insulin or Coumadin, you should include an extra prescription in your Go-bag. Some officials also recommend carrying a small handheld HAM radio or family service radio (walkie-talkie). A Siltarp is a lightweight silicone-impregnated nylon windproof, waterproof tarp for making an emergency shelter or simply to wrap around you. And even if you are using rain gear this will add an essential layer of protection. Protein powder and a thirty day supply of one-a-day vitamins is light weight, relatively inexpensive and compact, but these will provide some basic nutritional requirements.

Ideally, you might have the Go-bag stored in a footlocker or closet in your bedroom or in your vehicle. Aid organizations suggest both. Keep a t-shirt, a pair of pants, socks and sneakers with the Go-bag in your bedroom to lower the time you spend getting out the door. If you have physical limitations that do not allow you to carry a backpack, perhaps you can carry a headlamp, pocket knife and water bottle, hat and gloves in the pockets of a hooded waterproof coat.

While the strategy of having and preparing a Go-bag can literally save your life, don't risk your life trying to get to it if it isn't readily accessible within a minute or two after the earthquake. The most important thing is to survive the initial events.

When the Ground Begins Shaking, Duck, Cover and Hold Until It Stops. If you are indoors or outdoors stay there. If your Go-bag is available when the shaking stops grab it and go. Move as safely and as quickly as you can to a one hundred foot elevation. Injuries indoors during earthquakes result from being struck by falling objects, flying glass from bursting windows, in attempting to go from one room to another, or in trying to leave the building. Chimneys and walls with chimneys will also often collapse causing injuries in- and outdoors. If you are in bed, cover your head with a pillow and go into the fetal position on your side. Injuries outdoors during earthquakes often occur along the sides of buildings, from collapsing walls, flying glass, falling siding, roofing materials or electrical lines. During earthquakes, propane gas lines will also rupture, so do not light matches after an earthquake if you have a propane-based heating system or stove. A note of caution: a ruptured sparking electrical line and ruptured propane line will also cause an explosion.

To limit the possibility of injuries properly secure bookshelves, water-heaters, propane tanks, large mirrors and overhead fans. Cabinets containing dishes, pans, pots, glasses and plates should have latches. Containers of herbicides, pesticides, insecticides, solvents and propane should be stored in a shed in latched cabinets away from your house. If you have an older house, ask a contractor inspect it to make sure the framing sills are secured to the foundation. This was not a building requirement or a common practice fifty or sixty years ago and during an earthquake these houses may slide off of their foundations and partially collapse.

An Evacuation Plan

If the earthquake happens night you will want to have a headlamp immediately accessible at the top of your Go-bag. This will enable you to be dressed and headed toward higher ground about a minute after the ground shaking stops, with everything you need. Simply continue walking as quickly, calmly and as safely as you can along the right of way areas of the streets and roads. Your headlamp will help you negotiate possible debris fields you may encounter with both hands free, rather than holding a flashlight. This may save you five to eight minutes in reaching a 100' elevation.

As part of your preparation, find the shortest route to a 100' elevation and walk it with your Go-bag. Your city hall or local Red Cross Chapter will also be able to tell you the location of the designated Community Assembly Areas for evacuees when disaster conditions occur, but to go to the nearest 100-foot elevation whether it is a Community Assembly area or not. This can be determined from tsunami evacuation maps at your city hall. If you have children who are attending school, find out their school's evacuation plan.

What You Can Expect

Tsunami sirens will be activated at least an hour in advance of a distant tsunami's arrival from the coast of Japan, Chile, Alaska or Russia. The areas at greatest risk from a distant tsunami include beaches, estuaries, coves, harbors and the mouths of rivers—all areas below a twenty-five foot elevation. There will be at least an hour to pack cases of stored bottled water and dehydrated or canned food and drive to a Community Assembly Area or any 100-foot elevation. On isolated beaches several

miles from the nearest community you may not be able to hear a tsunami siren. If the ocean along the entire shoreline in front of you begins drawing rapidly out to sea, move immediately to higher ground.

When a major earthquake strikes the entire Pacific Northwest coast the disaster conditions will be more widespread. The four or five minutes of strong ground shaking will rupture streets, roads and bridges. Coastal communities will be isolated. Natural gas lines will break and municipal water and sewer mains will collapse causing fires and minor street-flooding before the tsunami arrives. Even buildings above a 100' elevation will be significantly damaged. Hundreds of bridges, overpasses, dams, highways, business centers and hospitals in major metropolitan areas such as Seattle, Portland and Salem will also be damaged or destroyed. The I-5 Highway through Medford and Ashland may be impassable. Hospitals and emergency medical services will not be functioning or available in most of the state. Ten to twenty-five minutes after the ground shaking starts, the seventy- to eighty-foot high plateaus of onshore tsunami waves moving at thirty miles an hour will cover most areas of rural coastal communities. The tsunami will also flood river beds and surrounding areas several miles inland. In reaching a safe 100-foot elevation or a Community Assembly Area, rest and wait for the All Clear to be given by emergency services personnel before returning to lower elevations. Lower area elevations may also pose health risks due to broken sewer mains and other organic and man-made contaminants. As much as possible avoid these areas.

After the tsunami there will be shortages of medical supplies, safe water, shelter and food. All federal disaster aid and recovery efforts will be concentrated in the areas most densely populated, such as Portland or Salem. Aid to rural coastal areas may not arrive for three or four weeks. If the earthquake is a foreshock, a main quake will follow days, weeks, months or years later. If it is a main shock, it will be followed by similar and smaller magnitude earthquakes over the next several years. The worst case scenario is an earthquake that lasts four or five minutes and a tsunami that arrives ten minutes after the start of the ground shaking. This leaves a five or six minute window for evacuation to higher ground.

Suggested Recommendations for a First Aid Kit

A personal first aid kit should only weigh two or three ounces: A pair of non-powdered surgical gloves, dust mask, scissors, tweezers, 2 small pkgs. Quick Clot or Celox, iodine swabs, antibiotic ointment, four packets of burn gel, 2 large gauze pads, 2 large non-adhering sterile pads, one roll of elasticized wound wrap, ibuprofen, aspirin, a moleskin, 4 medium butterfly bandages, insect repellent, 2 packets of after sting gel, Immodium and Ex-lax.

Suggestions for Treating Water

After an earthquake-tsunami event, all water except rain water should be considered contaminated by man-made or natural toxins, or both. Evacuees will also need approximately two gallons per day per person, for drinking water and hygiene. Water from seeps or springs above and away from the inundation zone, housing developments and pastures are likely to be the best water sources, but simply choose the clearest looking water you can find.

The best traditional methods for eliminating biological contaminants are boiling and chlorine dioxide tablets. The water disinfection tablets are available from Aquamira or Micropur. In boiling, bring the water to a rolling boil for one minute over a small cooking fire. Even if there is natural particulate such as algae in the water, boiling will kill any attendant biological contaminants. Aquamira or Micropur

water disinfection tablets are equally efficient, lightweight, less labor intensive and the best choice during emergency conditions when inclement weather prevents fire-starting. They are essentially oxygenated chlorine, but they have a completely different chemical structure than household bleach and a clear taste. Cut open the foil package of one tablet with a small pair of scissors that you keep with the tablets only for this purpose and add the tablet to a liter or quart of water without handling the tablet. Then wait four hours. Put the empty packaging in a separate baggie and seal it. This is important.

Both boiling and chemical treatment are highly effective where cryptosporidium from fecal contamination and other protozoa, bacteria and viruses are suspected or pervasive. The use of iodine crystals, tablets or drops used for water disinfection will not kill cryptosporidium and ordinary household chlorine bleach has both long term side effects and marginal success, according to the Center for Disease Control (CDC). Also, iodine should not be used for more than two weeks; should not be used by pregnant women or individuals with thyroid or other immuno-compromised conditions. The cost of Aquamira or Micropur tablets at two gallons a day is approximately \$130.00 per person for thirty days. Aquamira also produces disinfection drops, costing approximately \$36.00 for the same coverage, however it involves a two-step process before adding the chemicals to the water.

In areas where man-made contaminants are suspected or pervasive there is a pre-treatment step to eliminate them from drinking water before starting the disinfection process with tablets or boiling. Add small amounts of baking soda to mugs, quarts, liters and gallons of water—a teaspoon per gallon. Briefly stir in the baking soda and let sit for half an hour. The toxins will leach to the baking soda and sink to the bottom as sediment. Then carefully pour the water into the container you will utilize for disinfection or boiling, avoiding the transfer of the sediment. The practice of capturing falling rain water may also be an option.

Suggestions for a Small Cooking Fire and a Small Cooking Stove

A simple, lightweight, waterproof, inexpensive means of fire-starting requires a flint and steel striker, paraffin, wax or vaseline, cotton balls and a small magnesium bar. The flint and steel striker and magnesium bar are lightweight, waterproof and available at almost all sporting goods stores. Rub the paraffin, wax or Vaseline into the cotton and place it in a nest of dead cedar branch shavings taken from a standing tree. Scrape or cut a small few shavings from the magnesium bar, add them to the cotton ball, then send a small shower of sparks at the cotton ball with the flint and steel striker. It will also be less labor intensive if you use only twigs and small branches.

A Giga Power Stove and 500 gram fuel container by Snow Peak weigh approximately 1.5 lbs., costing about \$45.00. This small stove and its fuel would raise the weight of the Go-bag to approximately 14 lbs. 10 oz. Used specifically for 2 minutes twice daily on high for 30 days this stove fuel combination will heat two cups of fluid and help to prevent the possibility of hypothermia, especially when inclement conditions inhibit fire-building. During drier months this item will be less necessary to carry in your Go-bag.

Community Assembly Areas

The primary advantages of the Community Assembly Areas are the collective human resources that become available with a group. This includes problem-solving, organization and a stronger sense of

morale. Because the Community Assembly Areas are at higher elevations than the tsunami inundation zones they are more also likely to have sanitary conditions and marginally damaged buildings.

Most city governments do not yet have stores of food, medical supplies, shelters, porta-toilets, or water for disasters, or the proper storage units to house them, but this kind of preparation can be developed with municipal planning. Even then, it's probably a good idea to carry what you will need in case the best laid plans aren't available. And the minimalist approach of keeping your gear load light is especially important when your evacuation time is at a minimum.

For more information on Earthquake and Tsunami preparation contact your City Hall, Local Red Cross Chapter, or County Emergency Services Office.

This information is only meant to provide life-saving suggestions for a general readership in preparation for an earthquake-tsunami event. The author assumes no liability what-so-ever for the use of the recommendations provided, including but not limited to material losses, injury, psychological conditions or death. Individuals with disabilities or age-related limitations should contact the local Red Cross Chapter for more information. For more information on portable water-treatment, fire-starters or other gear, comments or suggestions, email johnroorbach@yahoo.com