

Hayden Island **EARTHQUAKE** Guide

by your Neighborhood Emergency Team



www.hayden-island.net

The Hayden Island *Earthquake Guide*

from your Neighborhood Emergency Team

By Sam Churchill

www.hayden-island.net

About

This booklet and website aggregates content about earthquake preparedness and provides information specific to Hayden Island. It walks you through steps you may want to take to prepare for The Big One.

It was created by Hayden Island [Neighborhood Emergency Team](#) (NET) volunteers. The goal is to spread awareness of earthquake and emergency preparedness.

The [Portland Bureau of Emergency Management](#) offers NET training to enable each neighborhood to have volunteers that can check on the welfare of neighbors, provide assistance if needed. It uses FEMA-based CERT training standards.

Download this booklet

This website is also available as a website, a free pdf file, a mobile download, and an ebook:

- hayden-island.com (General information)
- hayden-island.net (Emergency Preparedness)
- hinnet.atavist.com/net (Mobile)
- [hi_net.pdf](#) (Free pdf)

A major earthquake will strand people and create hardships for weeks or months. It pays to be prepared.

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1. Introduction

Welcome to Hayden Island's Emergency Preparedness guide — a go-to resource for island residents and visitors concerned about a major Subduction Zone Earthquake.



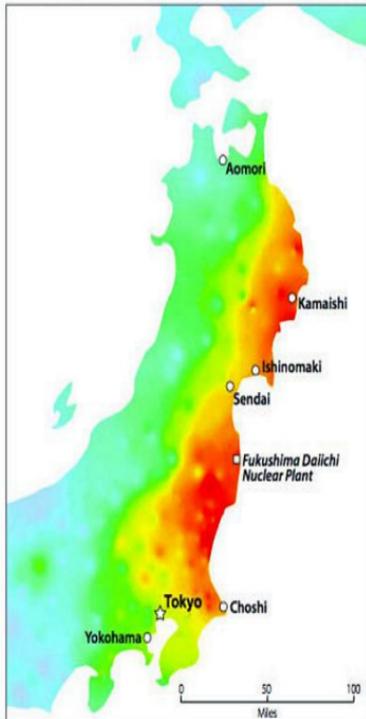
[Hayden Island](#) , is an 8 mile long island in the middle of the Columbia River, between [Vancouver Washington](#) and Portland, Oregon. It's a great place to live, work and play.

But geologists and numerous studies indicate much of western Oregon and Washington will experience a 9.0 Megathrust Earthquake. Maybe in 50 years. Maybe tomorrow.

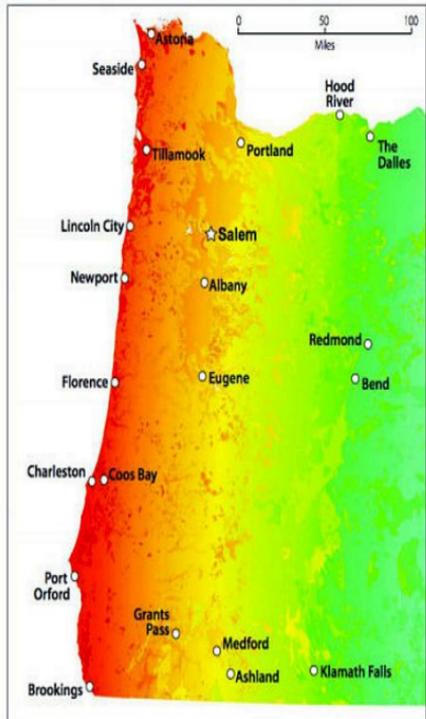
It will have an unparalleled impact. The last Cascadia Subduction Zone Earthquake happened in January, 1700.

Geologists say the next 9.0 [Cascadia Subduction Zone Earthquake](#) could happen anytime. We are now 315 years into a 200-500 year cycle.

ShakeMap for March 11, 2011 Tohoku M9 earthquake



ShakeMap for SIMULATED M9 Cascadia earthquake



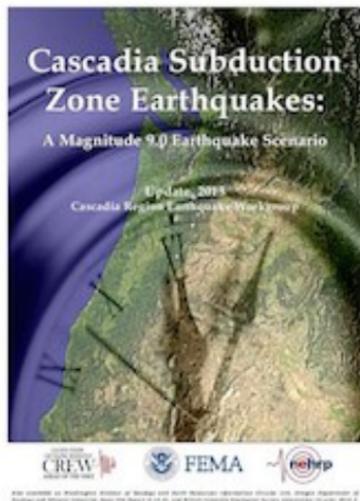
[Oregon Geology's map](#) shows the actual shake map from [the 2011 earthquake in Tohoku, Japan](#) and the anticipated full Cascadia earthquake. The lightest shaking in green may wake sleeping people.

The [Cascadia Region Earthquake Workgroup](#) has created a detailed magnitude 9.0 earthquake scenario.

Nobody knows when the Big One will happen...only that it WILL. Here's [your apocalyptic wake-up call from Portland Mercury](#).

The [Portland Bureau of Emergency Management](#), [Mult Co Emergency Management](#), [Clark County Regional Emergency Services Agency](#) and others, are preparing for the inevitable. Shouldn't you?

We hope you find this preparedness guide useful.



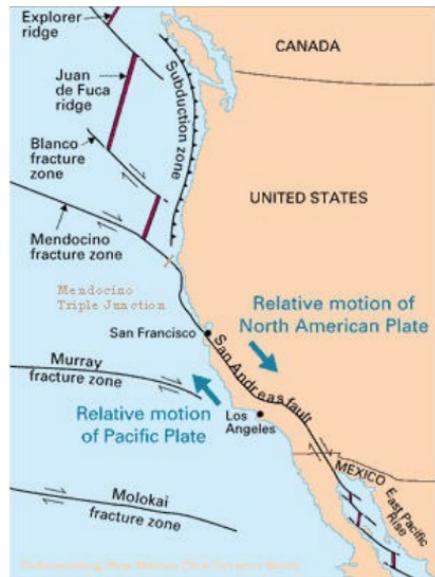
2. The Subduction Zone

The Cascadia Subduction Zone stretches from Northern Vancouver Island to Cape Mendocino California. It separates the Juan de Fuca Plate , a 700-mile chunk in the Pacific, and the North America plate , where we live.

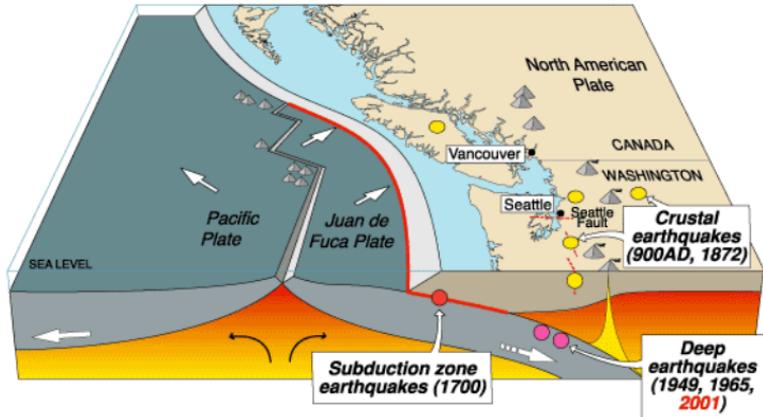
For more than 300 years, the Juan de Fuca Plate has been pushing underneath the North America plate. But the subduction is stuck. Relatively soon, the Juan de Fuca plate will be released like a spring.

That massive shift is expected to cause a major earthquake and Tsunami, collapsing many structures and causing the ground to sink six feet or more in places.

The earthquake and resulting tsunami would be similar to the 1964 Alaska earthquake and the 2011 Japanese Earthquake . If the whole shelf from Canada to California goes, it might be worse.



Cascadia earthquake sources



Source	Affected area	Max. Size	Recurrence
● Subduction Zone	W.WA, OR, CA	M 9	500-600 yr
● Deep Juan de Fuca plate	W.WA, OR,	M 7+	30-50 yr
● Crustal faults	WA, OR, CA	M 7+	Hundreds of yr?

“Over the past 10,000 years, there have been 19 earthquakes that extended along most of the margin, stretching from southern Vancouver Island to the Oregon-California border,” [according to Oregon State’s Chris Goldfinger](#) . “These would typically be of a magnitude from about 8.7 to 9.2 – really huge earthquakes.”

If a full-margin rupture happens (as it has before), the Northwest will suffer the worst natural disaster in the history of North America,[according to a widely quoted New Yorker article](#).



Roughly 3,000 people died in San Francisco’s 1906 earthquake. Almost 2,000 died in Hurricane Katrina. Almost 300 died in Hurricane Sandy.

FEMA projects that nearly 13,000 people will die in the Cascadia earthquake and tsunami. Another 27,000 injured. FEMA expects that it will need to provide shelter for 1 million displaced people, and food and water for another 2.5 million.

Table 5. Estimated injuries and deaths in Oregon resulting from the CSZ earthquake and tsunami

Area of Operation	Injuries			Fatalities		
	Earthquake	Tsunami	Total	Earthquake	Tsunami	Total
Coastal	5,000	1,500	5,500	300	4,500	4,800
I-5 corridor	9,000	0	9,000	400	0	400
Oregon total	14,000	1,500	15,500	700	4,500	5,200

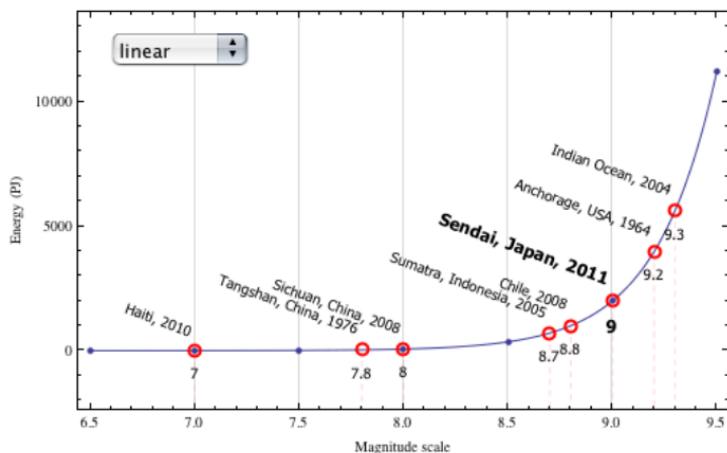
Source: FEMA CSZ Response Plan (2013) and Wood - see Methodology section for more detail

We’ve got a situation. A big earthquake is coming and we’re not prepared.

3. Should you be worried?

It's only common sense to get an emergency kit, gather supplies and make plans...just in case an earthquake or disaster strikes. That's what people in California and Japan do.

Earthquake Magnitude vs. Energy Released

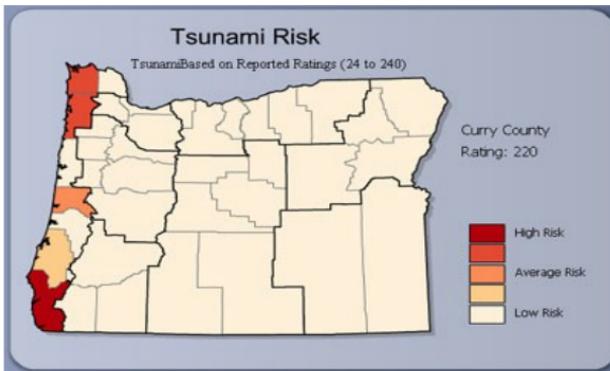


Shaking from a magnitude 9.0 [Cascadia Subduction Zone Earthquake](#) will damage infrastructure, especially older unreinforced masonry buildings. [Oregon Field Guide's "Unprepared" special](#) reviewed the possible impact a Cascadia Earthquake could have on Oregon. It's not a pretty picture.



<http://www.opb.org/television/programs/ofg/segment/more-about-unprepared>

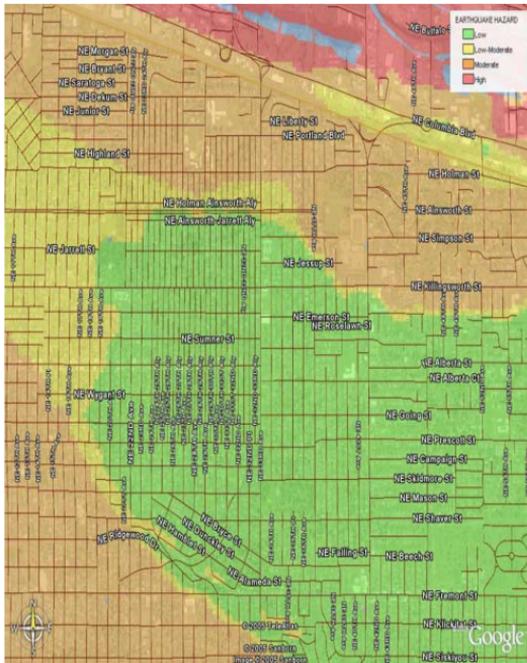
The resulting tsunami, arriving perhaps 10-20 minutes after the shaking stops, may have a big impact on the coast, but is not expected to be a threat to life or property past Longview.



Some 30,000 Oregonians live in the coastal tsunami inundation zone of a M9.0 earthquake. After the initial ground shaking, survivors may only have tens of minutes before the first wave makes landfall.

Assuming the 30,000 residents are present at the time of the initial earthquake and begin evacuating the tsunami zone at a slow walk, as many as 6,000 residents may be unable reach higher ground before the first wave hits.

The Port of Portland and Hayden Island are NOT in the tsunami inundation zone. Any tsunami would be largely dissipated within about 50 miles of the Columbia's mouth, near Longview, Washington, according to numerous studies.



However, Hayden Island residents are likely to experience severe liquefaction, moorage instabilities, and high currents which can damage ships and piers within harbors, [according to Oregon Geology](#).

4. What Do I Do?

Drop, Cover and Hold On is the official advice. Crawl under a sturdy table and avoid going outside. DO NOT run to other rooms. DO NOT stand in a doorway. You probably won't be able to stand up if you tried.

Artwork may fall from the walls and bookshelves may tip over. Let it go. Keep your head down.



Door frames in modern homes are no stronger than any other part of the house, and doorways do not protect you from falling objects, say experts.

If you tried to leave an office building, more injuries are generally caused by falling glass, concrete and debris. Many of Portland's residential homes built before 1976 have vulnerabilities to earthquakes and the damage may result in them being unusable or in need of costly repairs. Modern seismic codes were developed in the late 1980s and early 1990s.

What do I do?

DURING AN EARTHQUAKE YOU SHOULD:

If you are indoors, DROP and take COVER under a sturdy table or other furniture. **HOLD ON** to it and stay put until the shaking stops.

Stay clear of items that can fall and injure you, such as windows, fireplaces, and heavy furniture.

Stay inside. You may be injured by breaking glass and falling objects if you run outside.

If you are at the coast, walk to higher ground away from the ocean as soon as it is safe for you to move.

If you are driving, move your car as far out of the normal traffic pattern as possible and **stop** if it is safe. Stay away from structures or objects that could fall on you, such as bridges, overpasses, light posts, power lines, or trees. Stay inside your car.

If you are in the mountains, or near unstable slopes, **be alert for falling rocks, trees, or landslides** that could be loosened by the earthquake.



AFTER AN EARTHQUAKE YOU SHOULD:

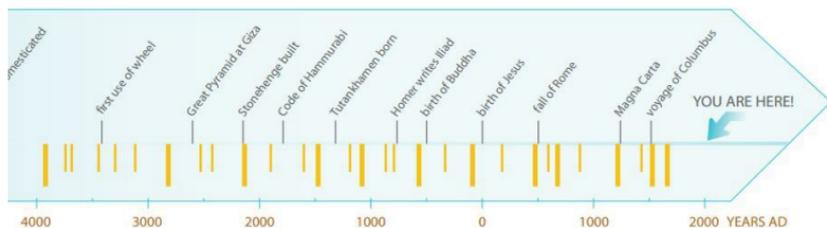
EVACUATE if you are in a TSUNAMI HAZARD ZONE. Walk inland or to higher ground as soon as it is safe to do so. Do not wait for official notification. Stay away from the coast until officials permit you to return.

Check for injuries. Do not move seriously-injured persons unless they are in immediate danger.

Check for hazards such as fires, gas leaks, downed utility lines, and fallen objects.

Clean up any potentially harmful material spills.

Expect aftershocks. Aftershocks following large earthquakes can be large and damaging.



If you're on the coast and it's 3am, RUN, don't walk to high ground if you feel a big quake. Don't wait for a warning siren. There isn't much time. Roads could become jammed. Round up your loved ones and get out of there the best way you know how. A Tsunami may be coming in minutes.

WHAT TO DO DURING AN EARTHQUAKE

- 1. If you live in an apartment building** or other multi-household structure with many levels, consider the following:
 - Get under a desk and stay away from windows and outside walls.
 - Stay in the building (many injuries occur as people flee a building and are struck by falling debris).
 - Be aware that the electricity may go out and sprinkler systems may come on.
 - DO NOT use the elevators.
- 2. If you are in a crowded indoor public location:**
 - Stay where you are. Do not rush for the doorways.
 - Move away from tall shelves, cabinets and bookcases containing objects that may fall.
 - Take cover and grab something to shield your head and face from falling debris and glass.
 - Be aware that the electricity may go out or the sprinkler systems or fire alarms may turn on.
 - DO NOT use elevators.
- 3. In a moving vehicle:**
 - Stop and stay in the vehicle.
 - Avoid stopping near or under buildings, trees, overpasses or utility wires.
 - Then, proceed cautiously, watching for road and bridge damage.

WHAT TO DO AFTER AN EARTHQUAKE

- 1. Be prepared for aftershocks.**
- 2. Check for injuries.** Do not attempt to move seriously injured persons unless they are in immediate danger of death or further injury. If you must move an unconscious person, first stabilize the neck and back, then call for help immediately. Never try to feed liquids to an unconscious person.
- 3. If the electricity goes out, use flashlights. Do not use candles, matches or open flames indoors after the earthquake** because of possible gas leaks.
- 4. Wear sturdy shoes in areas covered with fallen debris** and broken glass.
- 5. Check your home for structural damage.**
- 6. Check chimneys for visual damage.**
- 7. Clean up spilled medicines, bleaches, gasoline and other flammable liquids.**
- 8. Visually inspect utility lines and appliances for damage.**
 - If you smell gas or hear a hissing or blowing sound, open a window and leave. Shut off the main gas valve. Stay out of the building. If you shut off the gas supply at the main valve, you will need a professional to turn it back on.
 - Switch off electrical power at the main fuse box or circuit breaker if electrical damage is suspected.
 - Shut off the water supply at the main valve if water pipes are damaged. Do not flush toilets until you know that sewage lines are intact.
- 9. Open cabinets cautiously.** Beware of objects that can fall off shelves.
- 10. Use the phone only to report life-threatening emergencies.**
- 11. Listen to news reports** for the latest emergency information.
- 12. Stay off the streets.** Watch for fallen objects, downed electrical wires, weakened walls, bridges, roads and sidewalks.

Family Plan

Here's a **Family Plan for the big shake**:

- **Sit down with your family and/or friends to discuss what to do.** Imagine different times of day and scenarios—particularly who will be on what side of the river.
- **Set up at least two places to meet:** one outside of your home, the other outside of your neighborhood.
- **Designate a contact—outside of Portland.** Make them your communications hub. Phone lines within and into the city will be jammed. Outbound calls, particularly to other regions of the country, should be easier to make.
- **Texting often goes through when voice can't.**
- **Know your evacuation routes!** Portland's emergency planners have developed hazard maps for every neighborhood that include evacuation routes, hospital locations, and other emergency services.
- **Have family documents organized and ready to grab.** That means Social Security cards, insurance information, passports, and birth certificates.
- **Get some bikes.** Fuel might be tight for days, even months.

To prepare for and respond to emergencies, [Ready.gov](https://www.ready.gov) has lots of information available in many languages, including [ESPAÑOL](#).

The Scouts may have the best advise: **Be Prepared**. [Survival Guides](#) instruct everyone to have a Basic Disaster Supplies Kit, with 2 weeks of supplies, a [First Aid Kit](#) and a gallon of water per day per person.

5. Go-Kit

A [Basic Disaster Supplies Kit](#) should have enough supplies for at least two week or more for everyone in the family. It should include a basic first aid kit. The Red Cross has a handy guide.

Start with three necessities:

- 1. Water** - 1 gallon per person per day for a minimum of 3 days
- 2. Food** - items that don't need to be refrigerated or cooked (e.g., peanut butter, canned meats and foods, energy bars, etc.)
- 3. First Aid Kit** - include any prescription and over-the counter medications.

A Go Kit

You might pack some essential supplies in a backback to grab and go. Pack some gloves, bandages, flashlight, water, documentation of family members, and your family plan.

A family plan puts everyone on the same page, no matter where they are stuck. An out of state contact can act as your information hub - local communications may be less reliable. Consider a Go Kit for your car, one for your workplace, and one for each family member. That bag could come in handy.

Build an Emergency Kit

Here's how to [Build an Emergency Kit on a Budget](#) , with a [checklist from Oregon Public Health](#) , [FEMA](#) and the [Red Cross](#) .



<https://youtu.be/mNsaP1yqVrc>



Recommended Items to Include in a Basic Emergency Supply Kit:

- Water, one gallon of water per person per day for at least three days, for drinking and sanitation
- Food, at least a three-day supply of non-perishable food
- Battery-powered or hand crank radio and a NOAA Weather Radio with tone alert and extra batteries for both
- Flashlight and extra batteries
- First aid kit
- Whistle to signal for help
- Dust mask, to help filter contaminated air and plastic sheeting and duct tape to shelter-in-place
- Moist towelettes, garbage bags and plastic ties for personal sanitation
- Wrench or pliers to turn off utilities
- Can opener for food (if kit contains canned food)
- Local maps

An emergency supply kit should include the following:

-
- **Water** – one to three gallons per person per day, for drinking, cooking and sanitary needs.
- **Food** – ready to eat, non-perishable, high-protein, high-calorie foods that you enjoy (peanut butter, canned meats, energy bars, canned fruits and vegetables, etc.).
- **First aid kit** and first aid reference guide.
- **Portable battery-operated radio** and spare batteries.
- **Flashlights** and spare batteries.
- **List** of emergency contacts.
- **Blankets**, extra clothing, sturdy shoes and gloves.
- **Can opener** (non-electric).
- **Critical medications** for five days or more.
- **Extra pair of eyeglasses** and comfort items such as toys, books and games.
- **Copies of important documents**
- **Food and water for pets.**
- **Map of local area** in case evacuation is necessary.
- **Crescent wrench** for utility shut-off.
- **Duct tape** and plastic sheeting or large plastic garbage bags.
- **Extra cash** and coins for emergency purchases and pay phones.

Store your supply kit in a structurally sound location that's easy to get to.



Additional Items to Consider Adding to an Emergency Supply Kit:

- Prescription medications and glasses**
- Infant formula and diapers**
- Pet food and extra water for your pet**
- Important family documents such as copies of insurance policies, identification and bank account records in a waterproof, portable container**
- Cash or traveler's checks and change**
- Emergency reference material such as a first aid book or information from www.ready.gov**
- Sleeping bag or warm blanket for each person. Consider additional bedding if you live in a cold-weather climate.**
- Complete change of clothing including a long sleeved shirt, long pants and sturdy shoes. Consider additional clothing if you live in a cold-weather climate.**
- Household chlorine bleach and medicine dropper** – When diluted nine parts water to one part bleach, bleach can be used as a disinfectant. Or in an emergency, you can use it to treat water by using 16 drops of regular household liquid bleach per gallon of water. Do not use scented, color safe or bleaches with added cleaners.
- Fire Extinguisher**
- Matches in a waterproof container**
- Feminine supplies and personal hygiene items**
- Mess kits, paper cups, plates and plastic utensils, paper towels**
- Paper and pencil**
- Books, games, puzzles or other activities for children**

<http://goo.gl/mpEUb7>

First Aid Kit

You can buy a first aid kit or build one.



<http://www.redcrossstore.org/item/329165>

You could include the usual non-prescription medications, including pain relievers, antacids, ipecac, laxatives, hydrocortisone cream and vitamins.

Typical items in a First Aid kit may include:

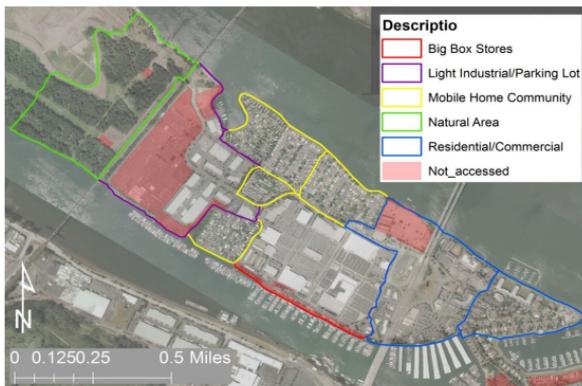
- Roller gauze and elastic bandages.
- Scissors and safety pins.
- Disposable gloves (two pairs).
- Non-stick sterile pads (different sizes).
- Assorted adhesive bandages.

- Triangle bandages (three).
- Aspirin or substitute.
- Antibiotic ointment.
- Current prescriptions medicines.
- Disinfectant (for cleaning wounds).
- Petroleum jelly.
- Cotton balls.
- Sunscreen.
- Thermometer.
- Tongue depressors (two).
- Soap and clean cloth/moistened towelettes.
- Tweezers/needle.
- Eye dressing or pad.
- Paper tape.
- Small plastic cup.
- Pen and note paper.
- Emergency phone numbers.
- First aid reference guide or first aid manual.

6. Home Safety

A 9.0 earthquake could last 3-5 minutes, compared to the 30-45 seconds of smaller, routine quakes.

Un-reinforced masonry buildings are the most vulnerable, along with structures that have high centers of gravity, such as lift bridges. People could become stranded since I-5 is the only highway off the island.



Hayden Island is built on sandy soil, so liquefaction may disrupt roads, crack sewer, water and natural gas pipelines, down power and communications lines and cause damage to manufactured homes and condos if they fall off their foundations.

THIRTY SUGGESTIONS TO MAKE YOUR HOME EARTHQUAKE SAFE

Connect these actions with their locations in the house below and on the previous page.

STEP 1—IDENTIFY HAZARDS

- 1 Know whether you live, work, or play in a tsunami hazard zone.
- 2 Hang plants in lightweight pots with closed hooks, well secured to a joist or stud and far away from windows.
- 3 Store fire extinguisher (type ABC) in easily accessible location.
- 4 Install strong latches on kitchen cabinets.
- 5 Use flexible connections where gas lines meet appliances.
- 6 Remove or lock refrigerator wheels, secure to studs.
- 7 Keep several flashlights in easily accessible places around the house.
- 8 Secure valuable electronics items such as computers and televisions.
- 9 Keep breakables in low or secure cabinets with latches.
- 10 Move heavy plants and other large items to floor or low shelves.

- 11 Hang mirrors and pictures on closed hooks.
- 12 Secure free-standing woodstove or fireplace insert.
- 13 Keep heavy unstable objects away from doors and exit routes.
- 14 Place bed away from windows or items that may fall.
- 15 Secure knick knacks and other small valuables with museum putty.
- 16 Brace overhead light fixtures.
- 17 Place only light weight/soft items over bed.
- 18 Secure top-heavy furniture to studs.
- 19 Keep wrench or turn-off tool in water-proof wrap near gas meter.
- 20 Know the location of your main electrical switch (fuse box or circuit breaker).
- 21 Secure water heater with metal straps attached to studs.
- 22 Trim hazardous tree limbs.

STEP 2—CREATE A PLAN

- 23 Have your emergency plan accessible and discuss with all family members.

STEP 3—PREPARE DISASTER KITS

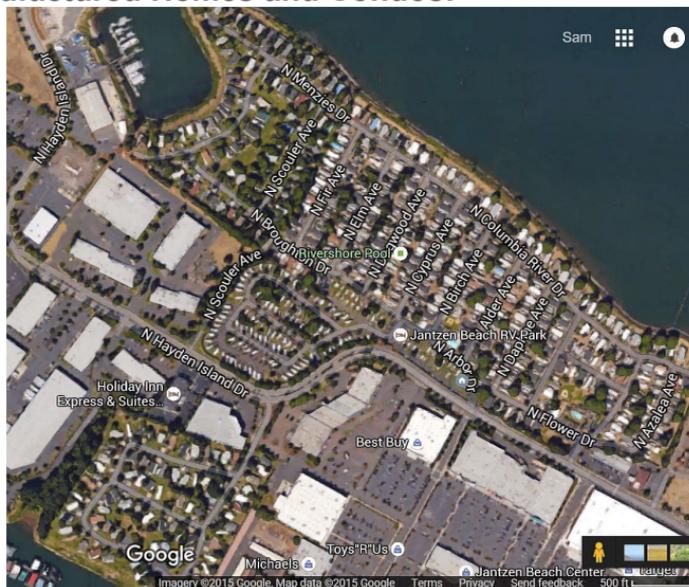
- 24 Obtain a NOAA Weather Radio with the Public Alert feature to notify you of tsunamis and other hazards.
- 25 Keep an emergency backpack with copies of important documents near the door to grab and go.
- 26 Keep flashlight, slippers and gloves next to beds.
- 27 Keep gas tank at least half full.
- 28 Store emergency food and water supplies in a dry accessible area. Include first aid kit, extra cash, portable radio, extra batteries, medications and other necessary supplies.

STEP 4—STRENGTHEN YOUR HOME

- 29 Use anchor bolts every 4 to 6 feet to secure home to foundation.
- 30 Reinforce brick chimneys.

<http://goo.gl/ZWiZbl>

Manufactured Homes and Condos:



<https://goo.gl/KVMZsn>

Mobile homes and manufactured houses are commonly NOT bolted to a foundation. Instead they rest on concrete blocks that are likely to collapse during low horizontal movement. This will cause the house to flop down onto its foundation.

A mobile home is likely to undergo less structural damage than an ordinary house, but is more likely to suffer extensive damage to the contents of the house. The house could be prevented from sliding off its blocks during an earthquake by replacing the blocks with a cripple wall and securing it. This would make the house insurable against earthquakes.



According to OSU, chances are two out of three that you'll be at home when the next big earthquake strikes, and one out of three that you'll be in bed. If you are an owner or even a renter, you can take steps to make your home safer against an earthquake.

- **Strap your Water Heater** and other heavy appliances.
- **Cabinets.** Inexpensive babyproof catches will keep cabinet doors closed during an earthquake
- **Stove.** Anchor a stove built on a brick hearth with three-eighths-inch diameter bolt.
- **Propane Tanks.** (1) Bolt the four legs of the tank to a concrete pad. (2) Install flexible hose connections between the tank, the supply line, and the entrance to your house. (3) Tie a wrench near the shut-off valve.

BEFORE an Earthquake:

- Secure your gas equipment to minimize movement during a quake.
- Replace semi-rigid gas connectors with flexible connectors.
- Move combustibles away from appliances.

AFTER an Earthquake:

- If you detect a natural gas odor, leave the area on foot and then call NW Natural at 800.882.3377.
- *ONLY, turn off your gas, if it is safe to do so.*
- If you turn off your gas, **DO NOT** turn it back on yourself. Leave it off and contact NW Natural.

Regarding Earthquake Shut-off Valves:

- If you choose to install an earthquake shut-off valve, be sure to use a qualified, licensed contractor.
- Earthquake shut-off valves must be installed on the customer's side of the meter, not on NW Natural's.
- If the shut-off valve has closed you will need to contact a qualified, licensed contractor to reset the valve and relight your natural gas appliances.

How to turn-off your meter:



<https://www.nwnatural.com/Residential/Safety/EarthquakePreparedness>

Floating Homes:



<https://goo.gl/oxKBXB>

The [Jantzen Beach Morage](#) (on the south side of the island) has an [emergency procedures sheet](#) that provides some guidelines for floating homes.

In case of FIRE:

- Call 911 immediately.
- Evacuate residents and alert neighbors
- DO NOT enter the building if there is smoke and/or fire.
- Use fire extinguishers and garden hoses as needed.
- Send someone to meet fire truck(s) and assist in directing fire location. The fire department has an emergency code and gate key for access.

In case of HIGH WINDS:

- Secure deck furniture, boat tie downs, plant containers, etc. Tip taller plants/trees over.
- Check float tie-ups and chain connections. Be prepared to turn off gas, water, and/or electricity breaker.
- Check utility connections. Know the location of the nearest fire extinguishers.
- Be prepared with safety ropes if needed.
- Assist neighbors. Know how to contact them if they are away.

In case of BREAK-A-WAY Houses/Floats:

- Call for help.
- Attach rope to cleat or stringer and secure to dock or piling, etc. until help can arrive.
- Turn off electrical breaker, gas and or water at walkway and report problem to utility company and moorage office.

In case of FLOOD or HIGH WATER:

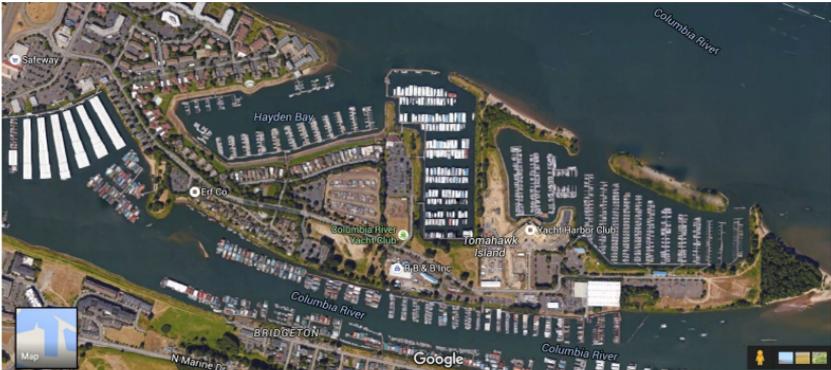
- Northwest Natural Gas will be notified of any gas leaks. They will turn off the gas service if they feel it is too dangerous or can't repair a leak.
- NWNG will determine the appropriate action to take.
- Moorage staff will contact Row Captains to help notify residents in the event an evacuation is mandated.
- In the event of an evacuation, all vehicle and pedestrian gates will be held open to allow easy
- Exit by residents leaving the moorage and easy access for emergency personnel.



Utility emergency numbers to keep handy:

- **JBMI Moorage Office:** (503) 283-2151
- **PGE:** (503) 464-7777, opt. 1
- **NWNG:** (503) 226-4211, opt. 9 or 1800-882-3377
- **Police (Non-Emergency):** (503) 823-3333

Boat Owners:



<https://goo.gl/vpWqZZ>

According to OregonSunami.org, the threat of a Tsunami is mostly coastal. But boat owners and those who live on their boats need to take precautions. If conditions permit, dock your boat and get out of the tsunami evacuation zone. Check with Coast Guard advisories before taking action.

If offshore evacuation is the best option for your vessel, proceed to a staging area greater than 30 fathoms (180 ft).

Go upriver, but **DO YOUR HOMEWORK** first. There won't be time to outrun a Cascadia tsunami but the surge will dissipate as you go upriver.

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.



For boaters, tsunami dangers include:

- Sudden water-level fluctuations
- Grounding of vessels as water level suddenly drops
- Capsizing from incoming surges
- Strong and unpredictable currents that can change direction quickly

Evacuation Preparation

- Develop a personal evacuation plan for handling emergency situations.
- Establish a meeting place at home and away from home if you become separated
- Carry a card with emergency/cell phone numbers of family members. Have a key contact/phone number of an out of state family member.
- Gather survival kit/emergency supplies, as necessary.
- Follow direction of emergency personnel as required.
- Know common First-Aid procedures (including CPR).
- Know how to turn off utilities and operate safety equipment such as fire extinguishers.

7. Tsunami and Liquefaction

A 30 foot Tsunami wave could inundate much of the low-lying coast just minutes after the shaking stops. Some 30,000 Oregonians live in the coastal tsunami inundation zone of a M9.0 earthquake. Run, don't drive, to higher ground, says Kevin Cupples, the city planner for the town of Seaside, Oregon.

What should I do if an earthquake occurs while I'm at the coast? [[back to top](#)]

Strong, local earthquakes may generate tsunamis. If shaking during the earthquake causes you to fall or to have difficulty standing:

1. **Drop, cover and hold.** Brace yourself under a sturdy object and watch out for falling debris.
2. After the shaking stops, **immediately move to high ground or inland.** Do not wait for an official warning; a tsunami may arrive within minutes.
3. **Stay away from the beach and low-lying coastal areas.** Tsunami waves may continue to arrive for many hours.
4. **Wait for the "All Clear" signal** from emergency officials before returning to low-lying areas. Buildings, roads, and utilities must be inspected for damage to ensure public safety.
5. **Be alert for aftershocks and stay tuned** to local radio, NOAA weather radio, and television broadcasts for emergency information and recovery assistance.

<http://www.oregongeology.org/tsuclearinghouse/faq-tsunami.htm>

On the coast, go to high ground immediately, advises Oregon Geology, at least 15 m (50 ft) above sea level. Go inland away from the ocean as far as possible. If you are unable to evacuate but are near a multi-story, reinforced-concrete building, go to the third floor or higher.

The Pacific Tsunami Warning Center, in Hawaii, issues Tsunami warnings minutes after the event. If the undersea event is thousands of miles away, it can take 4 hours before the Tsunami arrives.



<https://youtu.be/XlxhRs7bst4>

Oregonians may not be so lucky. The “hot zone” is not far off our coast. A tsunami wave off Oregon’s southern coast (more typical) may take a little longer to arrive, but if the whole Cascadia margin “rips”, a Tsunami could hit in as little as 10-15 minutes. After the initial ground shaking, survivors may have just tens of minutes before the first wave makes landfall.

The ground could also fall as much as 6 feet in places, making roads unreliable. If you must, climb to the top of a 3-4 story concrete building.



<https://youtu.be/ViNmb5vyBXw>

Assuming the 30,000 residents are present at the time of the initial earthquake and begin evacuating the tsunami zone at a slow walk, as many as 6,000 residents may be unable reach higher ground before the first wave hits, according to studies by the State of Oregon.

Tsunamis are primarily a coastal event. Any tsunami would be largely dissipated 50 miles up the Columbia River, near Longview, Washington, if not before.

However, Hayden Island residents are likely to experience severe liquefaction, moorage instabilities, and high currents which can damage ships and piers within harbors, according to Oregon Geology.



<https://youtu.be/RJCidfj-x9M>

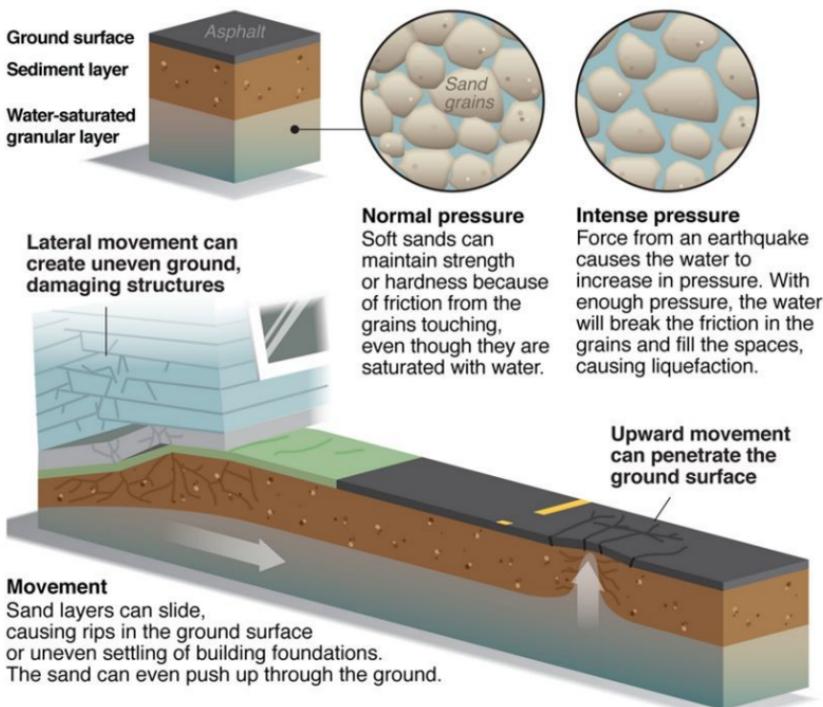
Liquefaction

Liquefaction is a phenomenon whereby soil behaves like quick sand in response to earthquake shaking, because water is forced out and lubricates the soil.

It's most often observed in sandy soils (like those of Hayden Island). Portland International (PDX) sits on soil prone to liquefaction while FEMA's primary backup, Redmond airport (RDM), is 145 miles southeast.

Soil liquefaction

Liquefaction is a phenomenon in which water-saturated sandy layers of earth act like liquids due to the pressure created by earthquakes.



Source: California Watch research

BRIAN CRAGIN / CALIFORNIA WATCH

Hayden Island Liquefaction

Hayden Island is [built on dredged mud and sand](#) from the Columbia River. It will be subject to severe liquefaction.

- Nearly all the 500 mobile homes on the island are not attached to their foundations, so many could suffer major damage if they slip off their foundations during the 3-5 minutes of shaking.

- Floating homes could be buffeted back and forth from wave action while liquefaction and landslides along the sea bank could make it difficult to get to land.
- Most condominiums have been built fairly recently so they may do somewhat better, but the sandy soil of Hayden Island, and its isolation as an island in the middle of the Columbia could put both structures and utilities at risk.

How much of a risk island residents and visitors may face from earthquakes, liquefaction, landslides and oil/gas spills, nobody can say for sure. Earthquake prediction is not a “thing”.

8. Walkie Talkies, NETs & Hams

Portland's [Neighborhood Emergency Teams](#) are volunteers in your neighborhood that assist and organize help. To communicate, they use walkie talkies and ham radios.

Walkie Talkies

Walkie Talkies are available at any big box store for \$30-\$50 a pair and don't require a ham radio license. They use the [GMRS /Family Radio Service](#) bands, around 462 and 467 MHz. They do not suffer the interference effects found on citizens' band (CB) at 27 MHz and have range between 1/2 mile to 5 miles (or more). They're handy, especially if cellular and land-lines are down.

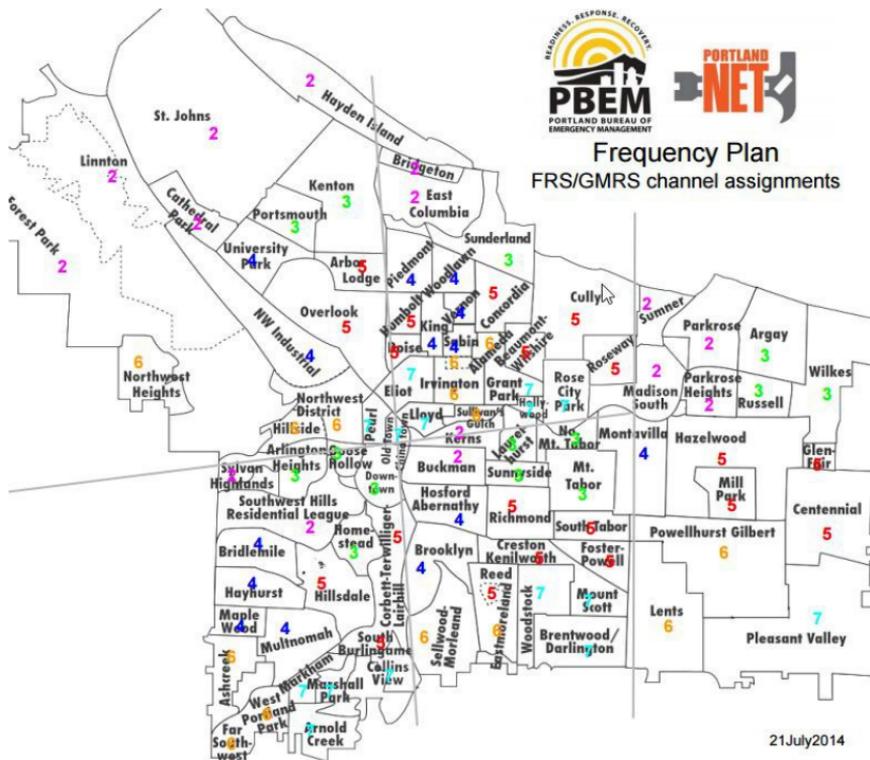


The Hayden Island NET team is mostly using [Midland GXT1000VP4](#) & [Motorola MS350R](#) walkie-talkies. They don't require a ham license.

Channels 1-7 can use 1/2 watt (or more with the high power switch). Channels 15-22 typically use 3-5 watts of power, but may require a \$60 (GMRS) mail-in license if you want to be fully compliant. [Channels 08 through 14](#) are limited to 1/2 watt.



Frequency Plan FRS/GMRS channel assignments



21 July 2014

The main talk walkie-talkie channel for emergency communications on both Hayden Island and Bridgeton is Channel 2 (462.5875). Kenton and Portsmouth mostly use Channel 3 (462.6125).

Hayden Island Walkie-Talkie Channels:

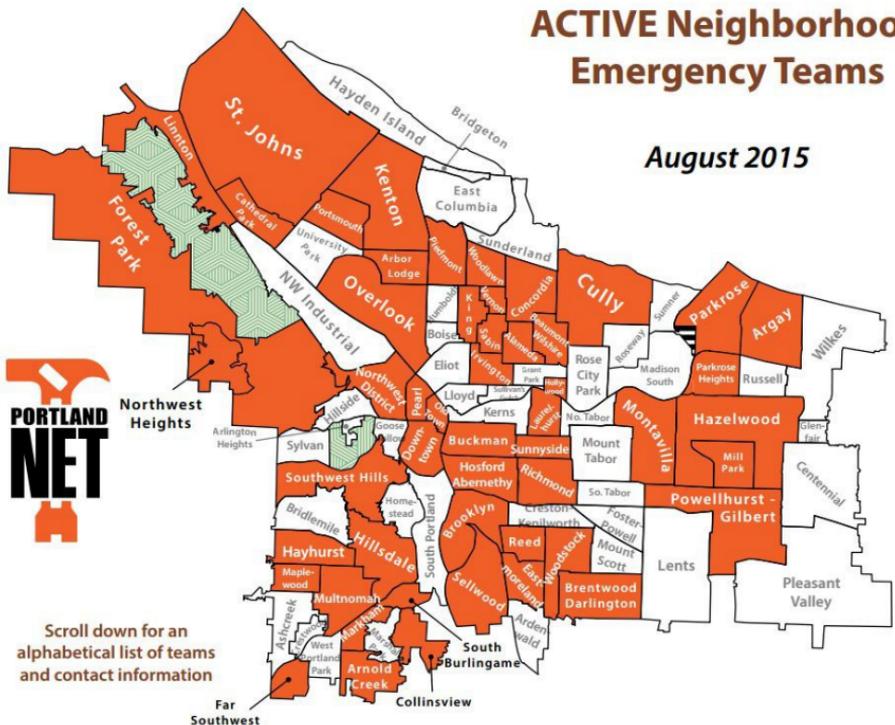
- **General use & talking to hams:** 4 & 6 (GMRS)
- **Jantzen Beach Moorage:** 19 & 21 (GMRS)
- **East Island (Waterside etc):** 20 & 22 (GMRS)
- **West Island (RV & MH parks):** 16 & 18 (GMRS)

Portland NETs

[Portland's Neighborhood Emergency Teams](#) (Facebook page & Map) are community volunteers. Their mission is to respond and report the current situation for professional responders and provide help as best they can. [Portland NET training](#) is guided by [Portland Fire and Rescue](#) personnel to do the greatest good for the greatest number.

ACTIVE Neighborhood Emergency Teams

August 2015



<http://www.portlandoregon.gov/pbem/article/456221>

[Here's a map of currently active Neighborhood Emergency Teams.](#) NET volunteers are your neighbors and may be the first on scene.

In an actual emergency, NET volunteers would meet at a nearby Staging Area, scout out the neighborhood situation in teams of two, identify tasks that unaffiliated volunteers can carry out, and communicate with the Portland Fire Bureau and Portland's Emergency Operations Center via ham radios or walkie-talkies.

Everyone is welcome to participate in NET training. It's free.



[This video](#) illustrates what Neighborhood Emergency Teams do. Hayden Island should have an emergency team activated by the end of 2015.

Each neighborhood has its own NET Operations & Communications Plan that describes what to do and how it will be done.

[A NET staging area](#) is intended as a rally point for NET members to gather after an earthquake (or other disaster) before going out into the community to provide assistance.

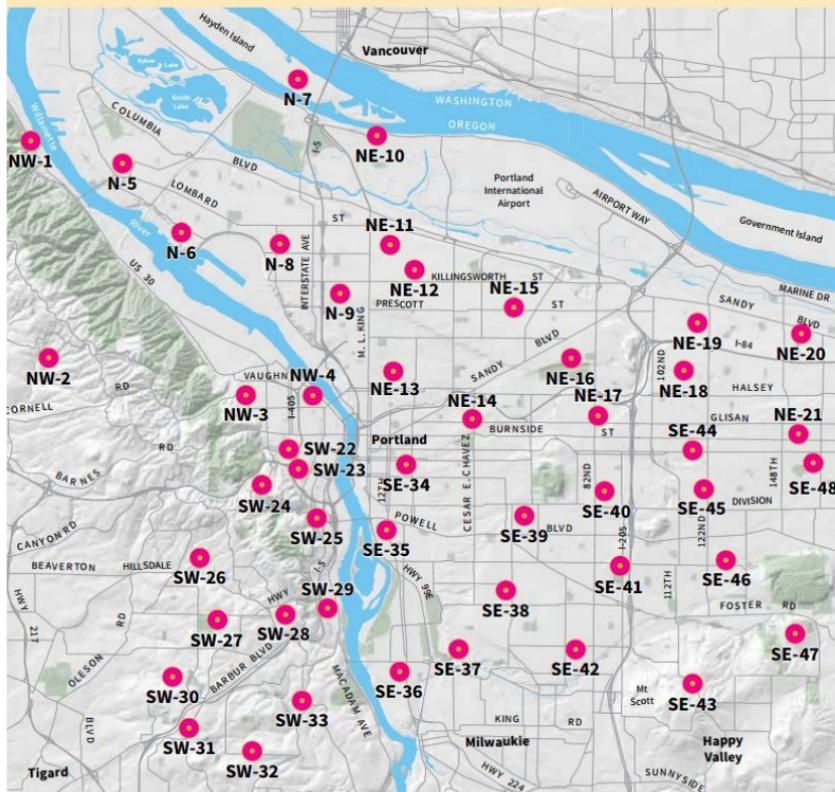
NET volunteers provide immediate response, in contrast to [Basic Earthquake Emergency Communication Nodes](#) which enable public outreach and communications. BEECNs are usually setup a day or two after an event.

In some cases the NET staging area and a [Basic Earthquake Emergency Communication Node](#) (BEECN) are co-located. BEECNs are designed for community support and community communications.

[A BEECN \(Basic Earthquake Emergency Communication Node\)](#) is the place to go in Portland after a big earthquake to ask for emergency assistance if phone service is down, or to report severe damage or injury.

Basic Earthquake Emergency Communication Nodes

Locate the earthquake "beacon" closest to where you live and/or work at www.publicalerts.org/earthquake



Visit publicalerts.org/earthquake today!

<http://www.portlandoregon.gov/pbem/59630>

The [BEECN Map](#) shows that the Bridgeton BEECN assembles at the Columbia Site Field, 716 NE Marine Drive (NE-10), while

Kenton assembles at Arbor Lodge Park, N Dekum Street and N Greeley Avenue (N-8). There are 48 locations throughout Portland.



<https://goo.gl/maps/9SjAwBirmfM2>

On Hayden Island, the [Basic Earthquake Emergency Communication Node](#) (BEECN) may be located on the Sleep Train parking lot, on the west side of the Jantzen Beach shopping center. BEECNs are located under a red and white tent.



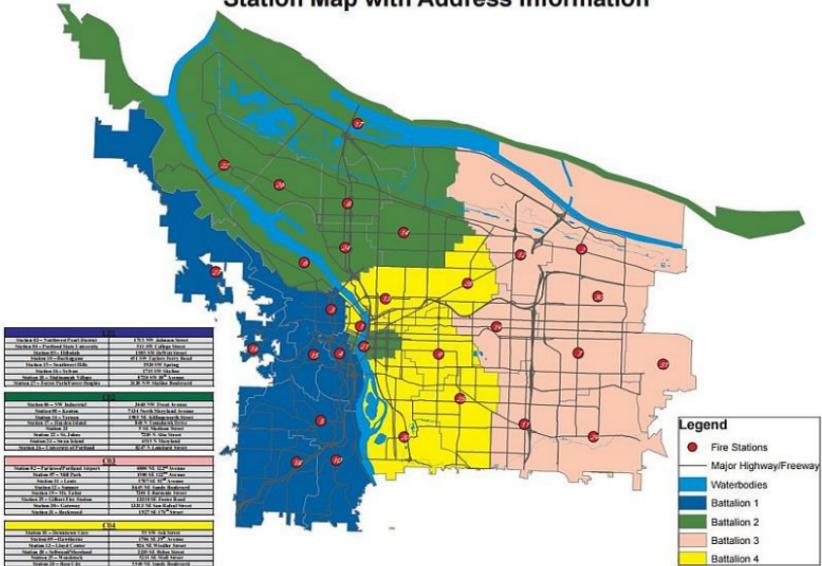
<https://youtu.be/TvN1KJloeB8>

BEECNs are primarily intended for communication purposes. They are places for the public to go after a major earthquake to call for help, and have walkie-talkies. PublicAlerts.org/earthquake has more information about the program.

Hayden Island's Fire Station

[Portland Fire & Rescue](#) provides emergency response through 30 fire stations throughout Portland. Hayden Island has its own Fire station (just east of Safeway) which has communications and rescue gear. Rescue Boat 17 and Fire Boat 17.

**Portland Fire & Rescue
Station Map with Address Information**



<https://goo.gl/P9yR0F>

Hayden Island's on-duty fire personnel include one company officer, one Harbor pilot, one engineer, and one firefighter paramedic. Local firefighters will likely be overwhelmed and away responding to the worst incidents.

Each station has a red Pelican case with ham and BEECN radios to contact Portland's Emergency Command Center, which is co-located at the 911 center in SE Portland. The ham radios at firestation are intended to communicate situation reports and other official communications when regular channels are down.

Each firestation has a ham radio and a large antenna that communicates many miles. The ham radio is available for firestation personnel as well as for NET volunteers who are licensed amateur radio operators.



<https://youtu.be/hKDSel1gz14>

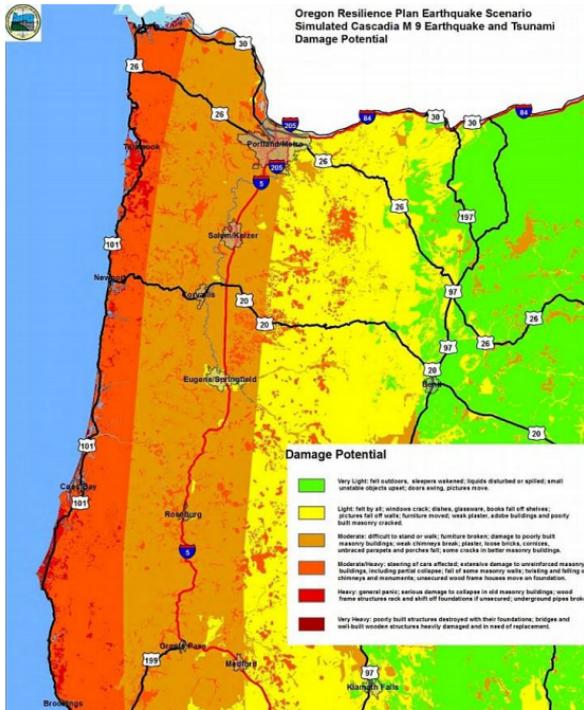
Amateur Radio is used to relay messages directly to the **Emergency Coordination Center** in SE Portland or elsewhere.

Multnomah County Frequencies					
Channel	Alias	Freq	Offset	Tone	Description
64	MC 2	147.280	+ 0.600	167.9	Multnomah Secondary Repeater
64	MC 5	146.460	--	--	Multnomah Secondary Simplex
66	MC 4	146.480	--	--	Multnomah Primary Simplex
68	MC 6	147.580			PBEM NET-Tac 1
69	MC 7	147.540			PBEM NET-Tac 2

The primary (emergency) ham frequency for the ECC is the Multnomah County Secondary Repeater (MC-2), at 147.280 MHz. It uses a repeater frequency offset of + 0.600 MHz and a Tone of 167.9. The fallback channel for ECC ham communications is (MC 5), a simplex channel of 146.460.

9. Hunkering Down

According to the Oregon Resiliency Plan, Oregon (even the Nation) has never witnessed a disaster of this magnitude. Food, water, transportation and communications may all be affected.



What can you expect from a big quake? Broken water pipes, downed power lines, highways and bridges impassable, people trapped in elevators, derailed trains and head injuries from falling objects. The degree of disruption will vary.

Some utility interruptions will last 1-3 days, while others may be out for 18 to 36 months. Both businesses and citizens should plan on being self-sufficient for longer than the 72-hour period.

If you had to re-locate, where would you go? What would you do? What would you take? It's worth considering. Buckle-up.

Based on the findings of the Oregon Resilience Plan, the harsh truth is it won't be business as usual. If the earthquake were to happen tomorrow, they estimate time to restore function would be:

- One month to one year to restore water and sewer in the valley zone.
- Six to twelve months to restore partial function of top-priority highways.
- Two to four months to restore police and fire stations.
- Eighteen months to restore healthcare facilities in the valley, three years or more in the coastal zone.

That's a disaster. But everyone's situation will be different.

Maybe you and your loved ones will be fine. Maybe your work place won't. On Hayden Island, shelter, transportation, power and sewage could be major issues.

Should you stay or should you go? It depends. The Oregon Resiliency Plan indicates Portland will suffer moderate to heavy damage.

You can deal with moderate damage, can't you? But what about longer term?

Don't panic. Let's review the situation.

On Hayden Island, your residence may only have light damage and remain structurally sound. Great. You might shelter in place.

But consider that there may be aftershocks for weeks and others who aren't so lucky.

Leaving the island (by boat) may be an option, but you can't bring more than a backpack to a shelter.

You may have 50 gallons of water available in your hot water heater, but what about light, heat and power? How long before utilities are back? For the first 72 hours, don't plan on any answers. Use your best judgment and listen to the radio.



<http://www.portlandoregon.gov/pbem/46475>

You've got a disaster kit with camping supplies, food and a first aid kit, don't you? Good. You'll be okay. Remember, people on the coast have it a lot worse than you. Deal with it.

State designated emergency shelters are commonly schools and churches (which Hayden Island doesn't have), followed by community centers that can hold many occupants. Local hotels and commercial buildings (such as mattress stores) might be used as temporary facilities. Today, most big-box stores use tilt-up concrete structures with light-framed wood or steel roofs. Buildings of this type that were constructed prior to 1995 have historically not performed well in earthquakes.

Power

BPA studies indicate that their main grid would require between 7 and 51 days for completion of emergency damage repairs after a magnitude 9.0 Cascadia earthquake. Electricity (and gas) for heat, light, refrigeration, communications and other essentials may not be available...for days or weeks. Emergency generators could supply limited power to shelters, work areas and other facilities in a few days. But gasoline might be scarce. Solar panels and batteries would be helpful but the need would likely far exceed their capacity.

Camping at home for a week without power wouldn't be a vacation. [RVers on Hayden Island](#) are probably the best prepared to "boondock". Ask them for advice. They're the experts.

Transportation

U.S. 101 is expected to be impassable, so I-5 will become the critical backbone after the earthquake. Emergency support may be staged along the corridor. A majority of bridges and other transportation infrastructure in western Oregon are susceptible to serious damage, particularly the Columbia I-5 bridge.

A Tier 1 route, such as I-5, is expected to be resilient within three days (at least for emergency vehicles), whereas a Tier 3 route may take up to four weeks. Say hello to water taxis.

Comparison of Target States and Estimated Time for Recovery

Infrastructure Facilities	Event Occurs	0-24 hours	1-3 days	3-7 days	1-4 weeks	1-3 months
Central Oregon Zone						
► OREGON STATE HIGHWAY SYSTEM						
State Highway System - Tier 1 SLR¹⁾			R	Y	G	
Roadways			R	Y	G/S	
Bridges			R	Y	G	
Landslides			R	Y	G	
State Highway System - Tier 2 SLR			R		Y	G
Roadways			R		Y	G/S
Bridges			R		Y	G
Landslides			R		Y	G

<http://goo.gl/8BznCF>

Transit agencies may play an important role. TriMet, in conjunction with school district buses, may assist with emergency evacuation. The river system and shipping channels could be significantly impacted. Marine issues include the condition of navigation channels immediately following a seismic event and how long it takes to clear navigation channels of silt and structural obstructions.

Food

Without power, local grocery stores will be unable to keep frozen foods or fresh meats and dairy cold enough to prevent spoiling. Most of the food in the grocery stores may be distributed (as opposed to sold) to the public because the store's registers will not work without power and there would be no sense in letting frozen foods, meats, and dairy products spoil in the store.

Once the food supply at local grocery stores is exhausted, the government will have to set up food distribution centers until local grocery stores regain electrical power and municipal services and can be resupplied.

Water

Hayden Island is surrounded by water. But a Cascadia earthquake would result in catastrophic impacts to existing water and wastewater systems. Oregon's pump stations along marine drive and waste water treatment plants, just south of the island, will be subject to damage from liquefaction. Concrete and cast-iron pipe will likely fail and leak in hundreds of places around the region.

Emergency water supplies may meet only subsistence needs (for example, direct consumption and very limited bathing).

For the first one to two months, water may be delivered via tankers to smaller tanks and bladders distributed throughout the community. People would wait in line to fill their containers and then carry the water home. Identification of each community's backbone water and waste water systems is essential. Water to fire hydrants could take two weeks. Water service to homes and businesses could take considerably longer.

Figure at least one gallon of drinking water per person per day. A toilet tank and water heater can supply emergency sources. A \$20 water filtering gadget, often used by campers, might be good to have in your emergency kit. Threats to public health and safety are expected to exist for one to three years on the Coast and six months to a year in the Valley. Clean water is paramount.

Sanitation

If your flush toilet doesn't work and the sewers are down, folks in your household will appreciate the comfort, hygiene and safety that come with a simple twin bucket toilet. It's easy to make. [Two, 5 gallon plastic buckets, one for pee and one for poo](#) does the trick.

A day's worth of pee has almost 10 times the volume of poo. So the pee bucket will fill up a lot faster. A single bucket camp toilet would fill up quickly and the mix is a mess to deal with. It's the poo bucket that contains most of the pathogens, but poo doesn't take up much space.



<http://goo.gl/JVw1pz>

Medical

Currently, essential healthcare facilities in Oregon are not expected to perform well during a Cascadia subduction zone seismic event. The facilities on the coast and in the valley will likely take over three years to recover to an operational state. Some facilities in eastern Oregon will take approximately 30 days to recover to an operational state.

Communications

Communications can't be restored until roads and electricity are functional. A number of the towers and antennas, especially in Vancouver, are located on top of existing buildings. They will be only as reliable as the buildings they are on. Satellite phones, ham radio and walkie talkies may be the only reliable communications options in the first 72 hours. Texting is better and more reliable than voice. Vancouver may be closer for microwave links.

Summary

If you're prepared to hunker down for 72 hours (three days), then give yourself credit. You're ahead of the game.

It's not the end of the world. The Big One may only cause moderate damage on Hayden Island and a temporary disruption in service. Nobody really knows. Plan for a worst case situation.

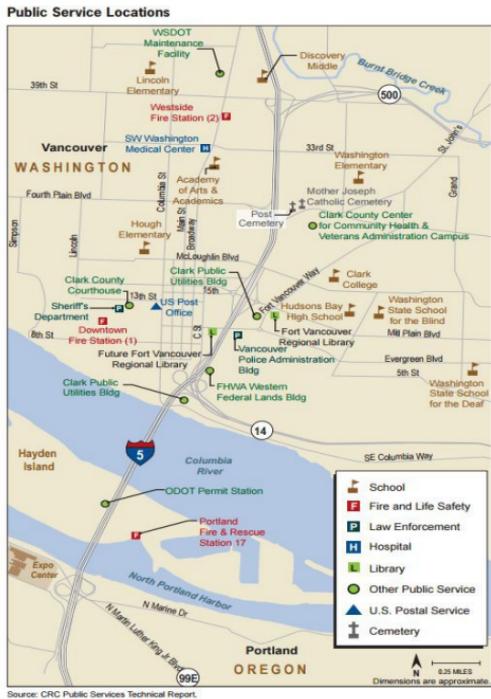
Have lots of comfort food, lots of games and books, and small toys the kids enjoy. They'll have a story to tell the next generation.

The American Red Cross says training and awareness is the best defense. Having prepared for the worst, we can be our best for our family, friends, and community. We will be stronger and better for the effort.

Don't stay up all night worrying about what *might* happen. Anything *might* happen. You'll probably be okay. Maybe some things will fall and break, the power may go out and wastewater may be a problem on the island, along with bridge traffic. But bridge traffic is *always* a problem.

Remember, [landslides closing Interstate 5 and I-30](#) happen all the time. [Landslides, downed trees and power outages affecting tens of thousands of people](#) are routine in Oregon and other states. Our friends and neighbors are our best resource.

We will survive.



10. Alerts & Social Media

Alerts and **social media** can keep you informed. Alerts (like **Amber Alerts**), are short messages that can be broadcast over radio or television and can even use telephone robocalls. **Social media**, like **Facebook**, **Twitter**, **Instagram**, **Tumblr**, **Reddit** and others, commonly use cellular or landlines, enabling two-way communication.



News and information on major service disruptions in the Portland-Vancouver metro area.

<http://www.publicalerts.org/>

Local Alerts

PublicAlerts is an online connection for residents in the Portland region to real-time emergency information. **PublicAlerts** can be received on your phone or PC using their web page or **Twitter Feed**. [Sign-up if you want emergency texts](#) delivered to your phone. **PublicAlerts** can be set to automatically provide information on LOCAL disruptions involving **roads and bridges**, **transit**, **public health**, **public safety**, **utilities**, **community services**, **schools**, **NET alerts**, and **weather**.

Federal Emergency Alert System

The **Emergency Alert System (EAS)** is a national warning system put into place in 1997 to enable the President to speak to the United

States within 10 minutes and for local emergencies. EAS messages are transmitted via AM, FM, broadcast TV, cable television and Land Mobile Radio Service, as well as VHF, UHF, and FiOS. The [Commercial Mobile Alert System](#), for smartphones [targets specific geographic areas](#) through nearby cell towers. Three types of messages will be sent to mobile phones: imminent threats, presidential messages, and [Amber Alerts](#).

Most alerts will be issued by the [National Weather Service](#). You can't opt-out of Presidential Alerts, but you can decline receiving Imminent threats or AMBER alerts. Under device instructions, select Email & messaging > Messaging settings. [Oregon State Police](#) also have a [Flash Alert Twitter feed](#).

Social Media

Social media lets users share and create content with 2-way communications. Concerns can be addressed. Cellular and landline communications, however, may be saturated or down in a big event. Public access to information may be established in isolated areas at first, perhaps enabled by working cellular, landlines, or commercial and consumer satellite internet connections. Here's [how to create a successful twitter wall](#) using Crowdscreen.

[Social Media Walls](#) display crowd-sourced tweets, Instagram photos and Facebook posts on a big screen. Participants tweet and post with the hashtag created by you. Live sources might include [live cameras along the Oregon Coast](#) and [ODOT's Statewide Cameras](#) as well as [Portland Police Incidents](#) (Twitter feed), Portland Fire Tweets, Portland Emergency Management tweets, [Oregon Emergency Management tweets](#) and Oregon State Police Twitter feeds. Tweets from Portland General, Pacific Power, NW Natural, Tri-Met, [ODOT & Portland Water Bureau](#) may also be helpful.

Newspapers on the [Oregon Coast](#) include [The Daily Astorian](#) , the [Seaside Signal](#) , [The News-Times](#) (Newport), and the [Chinook Observer](#) (Long Beach, Washington).



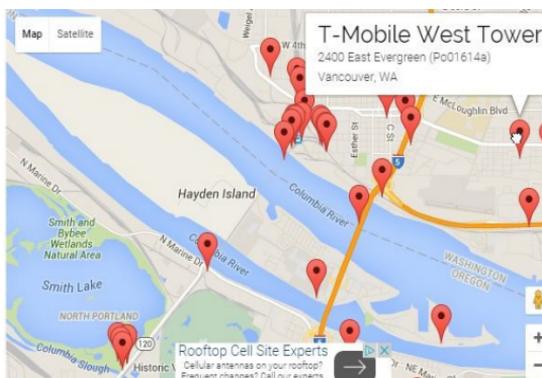
<http://www.postano.com/products/social-walls/>

There could be a variety of live media walls:

- Official Twitter feeds from government agencies such as Portland Fire, Portland Police, Portland OEM, Portland Weather Alerts, Oregon OEM, OSP, Vancouver OEM, and Washington State Patrol.
- Unofficial Citizen generated Twitter, Facebook and Instagram streams such as #VanWa and #Pdxalerts.
- Live cameras and live maps.

11. Cellular Service

Cellular carriers like AT&T, Verizon, T-Mobile and Sprint can be life savers. But cellular sites may be unreliable, overloaded or without power for some time after an earthquake. Fuel for a cell site's emergency generator may run out in 8 hours — and gas could be hard to get for months.



<http://goo.gl/mXnnS1>

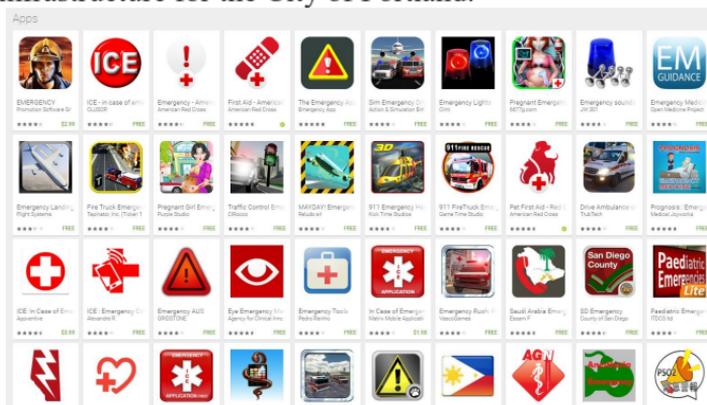
Restoring cellular will be a priority. The island is well served by all four cell carriers. [Verizon's tower](#) is inside the Hooters clock sign, [AT&T towers](#) are in back of Denny's and on East Hayden Island, [Sprint & T-Mobile towers](#) by the boat works opposite the Expo Center and Vancouver. Cell towers on top of Vancouver buildings, often pick up Hayden Island 911 calls.

Consequently, 911 calls may be answered by [Clark County Regional Emergency Services](#) not [Multnomah County 911](#) . Calls will be relayed to the appropriate provider.

Rooftop cell towers, however, don't support large emergency generators. In a real disaster, with power out for days, cellular service may be first restored at stand-alone towers or by self-contained trucks called [Cellular On Wheels](#) (COWs). With cellular service restored, lots of useful services will follow. An inexpensive smartphone, using a minimum pre-paid plan, could come in handy as a back-up.

Phone Apps

Portland Emergency Management recommends a number of Android, IOS, and Windows apps. PDX Reporter, for example, allows residents to report and request service calls to city assets and infrastructure for the City of Portland.



<https://play.google.com/store/search?q=emergency&c=apps&hl=en>

Lots of emergency apps are available for [Android](#) and IOS. Apps that (may) need an internet connections include: [The American Red Cross](#) provides different disaster preparedness apps in English and Spanish.

- [Earthquake by American Red Cross](#) lets you receive alerts and notifications when an earthquake occurs, prepare, and find help and let others know you are safe. [QuakeFeed](#) is the #1 Earthquake App for the iPad and iPhone.
- [The FEMA mobile app](#) for phones and tablets contains disaster safety tips, an interactive emergency kit list, meeting locations, and a map with open shelters.
- [Google's Person Finder](#) can assist you in both locating loved ones and sharing news with others.
- [Facebook's Safety Check](#) uses geolocation to let those close to a crisis zone check in and let their Facebook friends know that they're safe.
- Airbnb, a community marketplace for housing, [has a disaster response tool](#) to easily find free housing through the Airbnb platform.
- [ShakeMap and ShakeCast](#) are post-earthquake information tools for rapid situational awareness.
- [TaskRabbit](#) Is a web portal offering a real-time marketplace to connect local service providers with those that need assistance, without any fees
- [Geo](#) crowd sources geo-tagged photos of disaster-affected areas to assess damage over large regions
- [Google Docs](#) as well as [DropBox](#) and [Google Drive](#) make sharing documents easy. [Wiggio](#) is a free web application for working in groups.
- [Yammer Survivor Network](#) hosts private, online community spaces to serve as connection points and support networks for survivors and responders.
- Skype, of course, is available for Android, [Mac](#) and [IOS](#) and [Windows](#) .

12. Earthquake Science

Geology and oceanography have come together this year in the [Ocean Observatories Initiative](#), an unprecedented new tool for monitoring our coast. It will improve the already comprehensive seismic network throughout the Northwest and California.

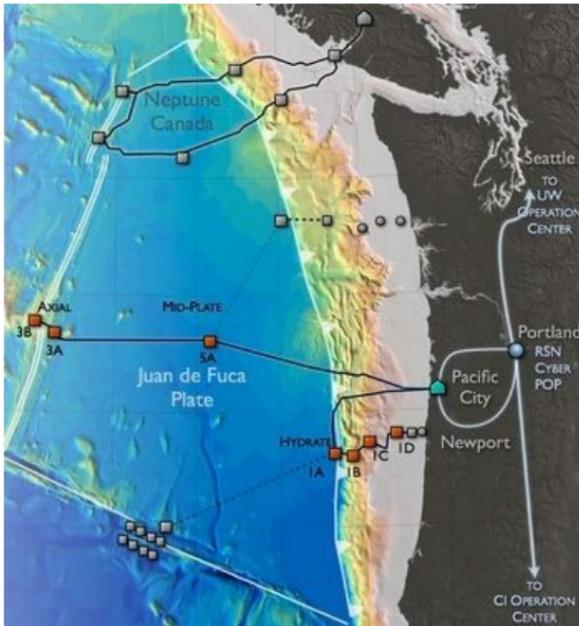


<http://goo.gl/EEPkTM>

Currently, some 240 seismometers have been installed throughout Washington and Oregon to detect vibrations. They send readings to a computer at the UW, where the regional seismic network creates an automated report within about 10 minutes after any seismic event.

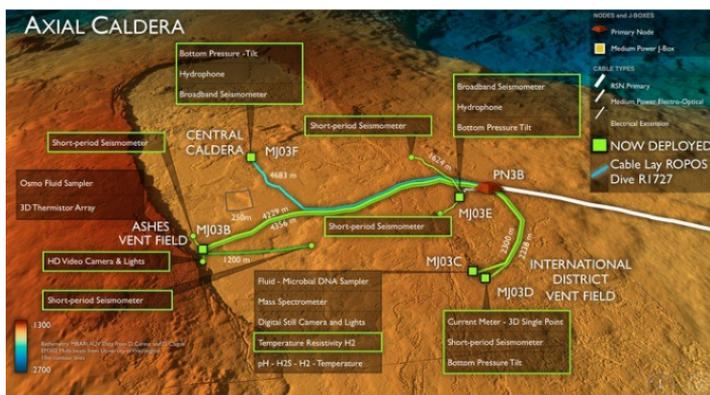
The Pacific Northwest Seismology Network (PNSN) recently implemented an earthquake warning system to predict the strength and location of earthquakes and provide short-term warnings. The earthquake warning system is under development, but not yet available to the public.

The Cascadia Initiative (pdf) is assembling a much more complete scientific picture of the Northwest's most dangerous fault — including what to expect the next time it ruptures. It's deployed more than 60 ocean-bottom seismometers and pressure gauges and is now receiving a “live” profile of events off our coast.



<http://goo.gl/KOG1LZ>

The Ocean Observatories Initiative has wired up the west coast, from California to Canada. It's the most extensive ocean monitoring system yet devised. Rutgers plans to hook up their ocean observatory to similar projects on the East coast and will deliver [OOI's Cyberinfrastructure](#). [Woods Hole](#), [Oregon State University](#) and [Scripps](#) are responsible for the OOI coastal and global arrays and their [autonomous vehicles](#).



http://www.ooi.washington.edu/story/Axial_Caldera_PN3B_Fully_Installed

Sensors on the [Axial Seamount](#) on the [Juan de Fuca spreading center](#) are now live. Axial is the most active volcanic site in the North Pacific.



https://youtu.be/4mouWf9S_T0

[Join the crew on the April-May 2015 Axial Seamount expedition](#) , mapping, and sampling the new lava flows from the 2015 eruption. In the summer of 2014, [Bill Chadwick](#) and colleagues correctly predicted that Axial Seamount would erupt in 2015.



<http://www.wired.com/2014/03/absurd-creature-week-water-bear/>

Maybe they'll bring back some [hyperthermophiles](#) , one of many weirdly amazing [extremophiles](#) . They can live in temperatures above boiling, in crushing depth and blackness. They're surrounded by sub-freezing water kept liquid by immense pressure. How did they get there?



<https://youtu.be/2pp17E4E-O8>

You can bet big pharma wants a piece of that DNA to create and patent new bio-engineered life forms. We're in international waters here.

The Wild West.



https://youtu.be/EBHK6T2_WSc

John Delaney, father of deep-sea, fiber-fed observatories, explains it all.

Summary & Links

The next 9.0 Cascadia Subduction Zone Earthquake could happen anytime. We are now 315 years into a 200-500 year cycle. This is the Big One. Buildings will topple, utilities will be out and people will die. There's little doubt about it.

Table 5. Estimated injuries and deaths in Oregon resulting from the CSZ earthquake and tsunami

Area of Operation	Injuries			Fatalities		
	Earthquake	Tsunami	Total	Earthquake	Tsunami	Total
Coastal	5,000	1,500	5,500	300	4,500	4,800
I-5 corridor	9,000	0	9,000	400	0	400
Oregon total	14,000	1,500	15,500	700	4,500	5,200

Source: FEMA CSZ Response Plan (2013) and Wood - see Methodology section for more detail

<https://goo.gl/QKvwlG>

FEMA projects that nearly 13,000 people will die in the Cascadia earthquake and tsunami. Another 27,000 injured.

But Northwesterners tend to be outdoorsy and have boots, tents, sleeping bags and cooking stoves. We also have a high level of volunteerism and social cohesion. We are strong and resilient. We can adapt. It's not the end of the world.

The [Oregon Resilience Plan](#) concludes very large earthquakes will occur in Oregon's future, and our state's infrastructure will remain

poorly prepared to meet the threat unless we take action now.

Be Prepared. A Basic Disaster Supplies Kit, with 2 weeks of supplies, a First Aid Kit and a gallon of water per day per person is cheap insurance.

Why not start this week, creating a plan and a supply kit. Just in case.

For more information about the earthquake hazard in British Columbia, Washington, Oregon, and northern California, visit CREW's website (crew.org) or contact the following organizations:

EMERGENCY MANAGEMENT BC
(www.embc.gov.bc.ca)

NATURAL RESOURCES CANADA
(www.nrcan.gc.ca)

EMERGENCY PREPAREDNESS FOR INDUSTRY & COMMERCE
(www.epicc.org)

WASHINGTON EMERGENCY MANAGEMENT DIVISION
(www.emd.wa.gov)

WASHINGTON STATE SEISMIC SAFETY COMMITTEE
(www.emd.wa.gov/about/SeismicSafetyCommittee.shtml)

WASHINGTON DEPARTMENT OF NATURAL RESOURCES, GEOLOGY
& EARTH RESOURCES DIVISION (www.dnr.wa.gov/geology)

OREGON OFFICE OF EMERGENCY MANAGEMENT
(www.oregon.gov)

OREGON SEISMIC SAFETY POLICY ADVISORY COMMISSION
(www.oregon.gov/omd/oem/pages/asspac/asspac.aspx)

OREGON DEPARTMENT OF GEOLOGY AND MINERAL INDUSTRIES
(www.oregongeology.org)

CALIFORNIA GOVERNOR'S OFFICE OF EMERGENCY SERVICES
(www.calema.ca.gov)

CALIFORNIA SEISMIC SAFETY COMMISSION
(www.seismic.ca.gov)

STATE OF CALIFORNIA DEPARTMENT OF CONSERVATION, CALIFORNIA
GEOLOGICAL SURVEY (www.conservacion.ca.gov)

FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA)
(www.fema.gov)

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
(tsunami.noaa.gov)

NATIONAL EARTHQUAKE HAZARDS REDUCTION PROGRAM
(www.nehrp.gov)

UNITED STATES GEOLOGICAL SURVEY
(usgs.gov)



https://en.wikipedia.org/wiki/Gorda_Ridge

Resources

- [American Red Cross](https://www.redcross.org) 503-284-1234
- [American Humane Society](https://www.americanhumane.org) 503-285-7722
- [Living on Shaky Ground](http://humboldt.edu/shakyground) humboldt.edu/shakyground
- [USGS Earthquake Preparedness](https://earthquake.usgs.gov/prepare) earthquake.usgs.gov/prepare
- [NOAA Tsunami Preparedness](https://tsunami.noaa.gov/prepare.html) tsunami.noaa.gov/prepare.html
- [FEMA](https://www.fema.gov) [ready.gov](https://www.fema.gov)
- [Centers for Disease Control](https://www.bt.cdc.gov) www.bt.cdc.gov
- [National Weather Service](https://www.nws.noaa.gov) [nws.noaa.gov](https://www.nws.noaa.gov)
- [Oregon Dept of Forestry](https://www.oregon.gov/ODF) [oregon.gov/ODF](https://www.oregon.gov/ODF)

Agencies

- [Ready.gov](https://www.ready.gov)
- [State of Oregon Emergency Management Office](https://www.oregon.gov/EM/StateEmergencyManagementOffice)
- [Oregon State Police](https://www.oregon.gov/OSP)
- [Multnomah County Emergency Management](https://www.multnomahcounty.gov/emergency)
- [Clark County Regional Emergency Services Agency](https://www.clarkcountync.gov/emergency)
- [Portland Bureau of Emergency Management](https://www.portland.gov/bureau-of-emergency-management)
- [Portland Fire & Rescue](https://www.portland.gov/fire-rescue)
- [Neighborhood Emergency Teams](https://www.portland.gov/neighborhood-emergency-teams)
- [BEECN Map](https://www.beeecn.com) and [BEECN – Spanish](https://www.beeecn.com)
- [Oregon Geology](https://www.oregon.gov/Geology)
- [Public Alerts](https://www.oregon.gov/Alerts)

Family Plans & Forms

[An Emergency GO-KIT PASSPORT](#) is a printed and detailed emergency plan that each family member should carry.



http://www.oregon.gov/OMD/OEM/plans_train/earthquake/go-kit_passport.pdf

Your Family Plan:

Your Family Plan gets everyone on the same page. It may be more important than putting food in a box. When phones are down, a Family Plan can save the day. Put a copy in everyone's wallet or purse.

AMERICA'S
PrepareAthon!
BE SMART, TAKE PART, PREPARE.

Ready 

Write your family's name above

Family Emergency Communication Plan

HOUSEHOLD INFORMATION

Home #: _____

Address: _____

Name: _____ Mobile #: _____

Other # or social media: _____ Email: _____

Important medical or other information: _____

Name: _____ Mobile #: _____

Other # or social media: _____ Email: _____

Important medical or other information: _____

Name: _____ Mobile #: _____

Other # or social media: _____ Email: _____

Important medical or other information: _____

Name: _____ Mobile #: _____

Other # or social media: _____ Email: _____

Important medical or other information: _____

SCHOOL, CHILDCARE, CAREGIVER, AND WORKPLACE EMERGENCY PLANS

Name: _____

Address: _____

Emergency/Hotline #: _____ Website: _____

Emergency Plan/Pick-Up: _____

Name: _____

Address: _____

Emergency/Hotline #: _____ Website: _____

Emergency Plan/Pick-Up: _____

Name: _____

Address: _____

Emergency/Hotline #: _____ Website: _____

Emergency Plan/Pick-Up: _____

Name: _____

Address: _____

Emergency/Hotline #: _____ Website: _____

Emergency Plan/Pick-Up: _____

IN CASE OF EMERGENCY (ICE) CONTACT

Name: _____ Mobile #: _____

Home #: _____ Email: _____

Address: _____

OUT-OF-TOWN CONTACT

Name: _____ Mobile #: _____

Home #: _____ Email: _____

Address: _____

EMERGENCY MEETING PLACES

Indoor: _____

Instructions: _____

Neighborhood: _____

Instructions: _____

Out-of-Neighborhood: _____

Address: _____

Instructions: _____

Out-of-Town: _____

Address: _____

Instructions: _____

IMPORTANT NUMBERS OR INFORMATION

Police: _____ Dial 911 or #: _____

Fire: _____ Dial 911 or #: _____

Poison Control: _____ #: _____

Doctor: _____ #: _____

Doctor: _____ #: _____

Pediatrician: _____ #: _____

Dentist: _____ #: _____

Medical Insurance: _____ #: _____

Policy #: _____

Medical Insurance: _____ #: _____

Policy #: _____

Hospital/Clinic: _____ #: _____

Pharmacy: _____ #: _____

Homeowner/Rental Insurance: _____ #: _____

Policy #: _____

Flood Insurance: _____ #: _____

Policy #: _____

Veterinarian: _____ #: _____

Kennel: _____ #: _____

Electric Company: _____ #: _____

Gas Company: _____ #: _____

Water Company: _____ #: _____

Alternate/Accessible Transportation: _____ #: _____

Other: _____

Other: _____

<http://www.fema.gov/media-library/assets/documents/108887>

FAMILY EMERGENCY COMMUNICATION PLAN

HOUSEHOLD INFORMATION

Home #: _____

Address: _____

Name: _____ Mobile #: _____

Other # or social media: _____

Email: _____

Important medical or other information: _____

Name: _____ Mobile #: _____

Other # or social media: _____

Email: _____

Important medical or other information: _____

Name: _____ Mobile #: _____

Other # or social media: _____

Email: _____

Important medical or other information: _____

Name: _____ Mobile #: _____

Other # or social media: _____

Email: _____

Important medical or other information: _____

SCHOOL, CHILDCARE, CAREGIVER, AND WORKPLACE EMERGENCY PLANS

Name: _____

Address: _____

Emergency/Hotline #: _____

Website: _____

Emergency Plan/Pick-Up: _____

<http://www.fema.gov/media-library/assets/documents/108887>

**SCHOOL,
CHILDCARE,
CAREGIVER, AND
WORKPLACE
EMERGENCY PLANS**

Name:
Address:
Emergency/Hotline #:
Website:
Emergency Plan/Pick-Up:

Name:
Address:
Emergency/Hotline #:
Website:
Emergency Plan/Pick-Up:

Name:
Address:
Emergency/Hotline #:
Website:
Emergency Plan/Pick-Up:

**IN CASE OF
EMERGENCY
(ICE) CONTACT**

Name: Mobile #:
Home #: Email:
Address:

**OUT-OF-TOWN
CONTACT**

Name: Mobile #:
Home #: Email:
Address:

**EMERGENCY
MEETING PLACES**

Indoor:
Instructions:
Neighborhood:
Instructions:

Out-of-Neighborhood:
Address:
Instructions:

Out-of-Town:
Address:
Instructions:

**IMPORTANT
NUMBERS OR
INFORMATION**

Police: Dial 911 or #:

Fire: Dial 911 or #:

Poison Control: #:

Doctor: #:

Doctor: #:

Pediatrician: #:

Dentist: #:

Hospital/Clinic: #:

Pharmacy: #:

Medical Insurance: #:

Policy #:

Medical Insurance: #:

Policy #:

Homeowner/Rental Insurance:

#:

Policy #:

Flood Insurance: #:

Policy #:

Veterinarian: #:

Kennel: #:

Electric Company: #:

Gas Company: #:

Water Company: #:

Alternate/Accessible Transportation:

#:

Other: #:

Other: #:

BUILD A KIT ON A BUDGET CHECKLIST

- Bags or container for kit
- Water - 3 gallons - one gallon per person per day
- Food - enough for 3 days
- Battery - powered or hand-crank radio ([NOAA Weather Radio](#), if possible)
- Extra batteries
- First aid kit - also include applicable prescription medications
- Whistle - to signal for help
- Filter mask
- Moist towelettes
- Wrench or pliers
- Manual can opener
- Plastic sheeting
- Duct tape
- Garbage bags
- Flashlight
- Unique family needs - entertainment, rain gear, blanket

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Getting Everything Together

Commercial reuse of plastic buckets for food is illegal so supermarkets, restaurants and bakeries often give them away for free. Donated buckets may lack lids but both buckets and lids are sold at hardware stores and online.

Buy toilet seats that fit buckets at camping stores or online. Or adapt seats from home toilets to fit.

Handwashing is critical. Use of hand sanitizer and disposable gloves and wipes will help you conserve your emergency water supply for essential handwashing.

Keep toilet paper, soap, bottled water, disposable gloves, towels or wipes and absorbent bags of carbon material in a bucket. Include sanitary napkins or diapers, if needed. Nest in empty buckets that remain available for everyday cleaning chores.



For More on Disaster Sanitation

See www.phlusb.org and www.cbacna.org

For handwashing, make the Tap Up hand bucket hand sink. See directions in MCM's Sewer Catastrophe Companion.



Preparing compost that is safe to use in gardening requires extra steps. The process is explained in Sewer Catastrophe Companion and on website of the New Zealand team: www.composttoilets.co.nz



PHLUSH (Public Hygiene Lets Us Stay Human) is an all-volunteer advocacy group based in Portland, Oregon. We receive support from the Old Town, Chinatown Neighborhood Association and Neighbors West/Northeast. PHLUSH is a member of the World Toilet Organization and a partner in the Sustainable Sanitation Alliance.

We are grateful to the New Zealand Pharmaceutical Emergency Response Network for the practical elegance of their design.

The Portland Bureau of Emergency Management has reviewed the design and posted instructions at <http://www.portlandoregon.gov/ebm>

We are indebted to Mully Danielsson and Mathew Sappoport of MCM, for their expertise and permission to use illustrations from their Sewer Catastrophe Companion.

PHLUSH Public Hygiene Lets Us Stay Human

115 SW Ash Street #400, Portland, OR 97204
www.phlusb.org
[facebook.com/PHLUSH](https://www.facebook.com/PHLUSH)
twitter.com/PHLUSH
 Facebook: PHLUSH



The Twin-Bucket Emergency Toilet



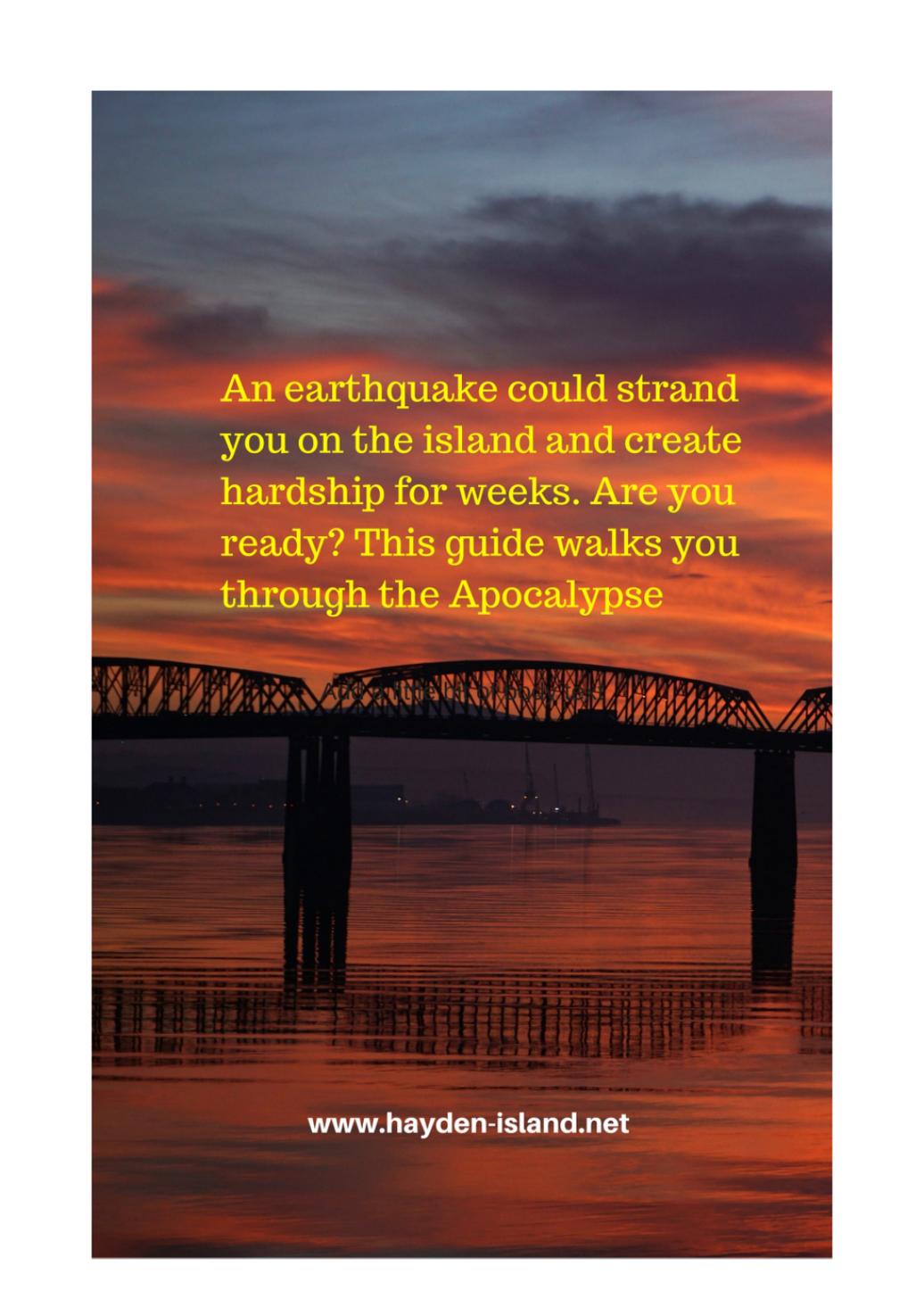
A Household Toilet
for Oregon
Emergency Kits

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Recommended Items to Include in a Basic Emergency Supply Kit:

- Water, one gallon of water per person per day for at least three days, for drinking and sanitation
- Food, at least a three-day supply of non-perishable food
- Battery-powered or hand crank radio and a NOAA Weather Radio with tone alert and extra batteries for both
- Flashlight and extra batteries
- First aid kit
- Whistle to signal for help
- Dust mask, to help filter contaminated air and plastic sheeting and duct tape to shelter-in-place
- Moist towelettes, garbage bags and plastic ties for personal sanitation
- Wrench or pliers to turn off utilities
- Can opener for food (if kit contains canned food)
- Local maps



A dramatic sunset over a body of water. The sky is filled with dark, heavy clouds, with a bright orange and red glow from the setting sun. In the foreground, the dark silhouette of a bridge with a truss structure spans across the water. The bridge's reflection is visible in the calm water below. In the distance, a few small lights and the masts of a boat are visible on the horizon.

An earthquake could strand
you on the island and create
hardship for weeks. Are you
ready? This guide walks you
through the Apocalypse

www.hayden-island.net