

## EARTHQUAKE AWARENESS AND PREPARATION SUMMARY

Prepared by Eric Dittmer and Harry Smedes \*  
Emeritus Professors Southern Oregon University

The 1993 earthquakes near Salem and Klamath Falls were, fortunately, relatively small. However, the Tohoku Earthquake and tsunami striking Japan in 2011 exceeded a Richter Magnitude 9. Both are reminders that we need to be more aware of and prepared for earthquakes here in Oregon. In fact, recent geologic studies show that the Pacific Northwest has experienced earthquakes of a Magnitude 8 or 9 (similar to the 2011 Tohoku, Japan event), every 250 to 350 years.

Clues to our earthquake history have been found in the rocks and sediments along the beaches and in the ocean bottom off the Oregon and Washington coast. Scientists from University of Washington and Oregon State University have been able to determine that many trees along our coast died all at the same time early in 1700 AD. They also found that a large Tsunami (seismic sea wave) hit Japan on January 26, 1700. Scientists estimate that the earthquake causing that tsunami had a Richter Magnitude of 8 or 9 and was located just off the coast of Oregon and Washington along what is now referred to as the Cascadia Subduction zone (CSZ). The offshore subduction zone fault is the boundary between two colliding crustal plates along a 600 - mile zone extending from northern California to southern British Columbia.

The dating of offshore sediments found multiple tsunami related deposits over the last 10,000 years indicating major earthquakes have occurred every 250 to 350 years. The last one was dated January 26, 1700. Based on this and other corroborating evidence scientists now believe that there is a 37% chance of a CSZ Mag. 8+ earthquake occurring in the Pacific Northwest within the next 50 years (Chris Goldfinger, OSU).

When the CSZ earthquake occurs, the extent of casualties, infrastructure damage and long-term economic disruption would be severe. **It is advisable to be aware of and prepare for the possibility of a large earthquake where we live.** Earthquakes like the one affecting San Francisco in 1989 (Mag. 7) or Klamath Falls in 1993 (Mag. 6) released only a small fraction of the energy of a Mag. 8 or 9 event. Should the CSZ fault rupture along much

of its length, there could be as much as 5 minutes of intense ground shaking!  
You should think about the following expected situations:

- Police, fire, paramedics and other first responders will be overwhelmed. Immediate rescue needs will be up to you, your neighbors and co-workers.
- Your family members may not be together, and you will want to contact them; but the phone systems may be so overloaded that even your emergency calls cannot get through. This problem was evident as recently as the September 8, 2020 fires here in Jackson County.
- You and your family, your friends and neighbors may need to be entirely self-sufficient for weeks, if not months.
- You may not have electricity, water, food, shelter or essential emergency supplies. Your lifestyle will change!
- Buildings, streets, bridges, water/sewer and other infrastructure systems will likely be damaged. Electricity, natural gas and gasoline may not be available for weeks.
- You may also have emergency responsibilities at your work, while you are anxious about the status of your family at home.
- Are you able shut off your electricity, natural gas and water? Do you need a special tool?

Public agency staff have earthquake response plans. Earthquake drills are **required** in Oregon public schools. The Oregon Department of Geology and Mineral Industries and the State Department of Emergency Management are promoting public awareness programs statewide. We should also consider the possibility of an earthquake before it happens.

REMEMBER even a large earthquake is survivable; if you are PREPARED. The following brief checklist of things can help you prepare for a future earthquake or similar emergency.

## **BEFORE AN EARTHQUAKE**

Prepare a **disaster plan** and discuss these issues with family and at work with co-workers. Practice the plan. For example:

- Find the best "Drop Cover and Hold On" location, such as under a sturdy table or desk, near a wall away from such hazards as glass and tall, heavy objects. Are there other "safe" areas?
- Check for obvious **hazards**: place heavy objects as low as possible on shelves, locate windows and other large glass hazards.
- Store hazardous chemicals and breakables carefully, low on shelves.
- Consider adding secure latches to cabinets.
- Locate and label electricity, natural gas and water shutoffs. Show others and obtain any tools needed to shut them off.
- Know the best exit route(s) from your home and work and have sturdy shoes handy to protect your feet from broken glass.
- Make sure everyone knows **not** to use the phone unless there **is** a serious emergency. Land lines and cell phone texting seem to work best. Have a contact person outside the Pacific Northwest. Know your emergency numbers.
- Prepare an emergency supplies "kit" and store it in a safe, accessible location. Include flashlights, fire extinguisher, first aid kits, battery-powered radios and know how to use them. Learn and practice first aid. You should have supplies of food, water, medicines, fuel and cash needed for several weeks! See web sites below for detailed lists. Think "Two Weeks Ready".

Consider "Mapping Your Neighborhood" to gather resource information to share and to learn who lives where and anyone having special needs.

## **DURING AN EARTHQUAKE**

**Drop, Cover and Hold ON!** (immediately when you know it is an earthquake). **Hold on** to your cover so it does not slide away from you. Cover your head and keep away from known hazards such as windows.

- If you are inside, **DO NOT RUN OUTSIDE!** (discussion to follow)
- If you are outside, check your surroundings - stay away from obvious hazards such as older buildings, bridges and electrical wires, etc.
- If in a car, pull over to an area away from buildings, bridges, trees and powerlines. Practice "Situational Awareness".

## **JUST AFTER THE EARTHQUAKE**

- Try to remain calm - others may look to you for help. 95% of emergency rescues are thanks to your neighbors and co-workers!
- Check to see if you and those near you are injured or alright.
- **Do not use phone except for reporting an emergency (call 911).**
- Note condition of the building; check for gas and water leaks (only turn off the gas if you smell it).
- If inside, make sure those for whom you are responsible are accounted for are safe; and, if mobile, can carefully exit the building with you.
- Meet at an open area away from obvious hazards.
- **Prepare for aftershocks!**
- If the earthquake was strong enough to cause building damage, do not re-enter the building until given permission by a qualified expert.

## **LONG TERM CONSIDERATIONS**

- The lessons from Hurricane Katrina, recent fires and other major disasters indicate there will likely be months, if not years of social and economic disruption. How will our society react to lack of accustomed resources?
- Take stock: Be prepared for post-earthquake realities such as: injuries, lack of utilities and communication, connecting with family, preserving food, water, etc.
- Our area may be facing the need to care for displaced people from the coast or rural areas.

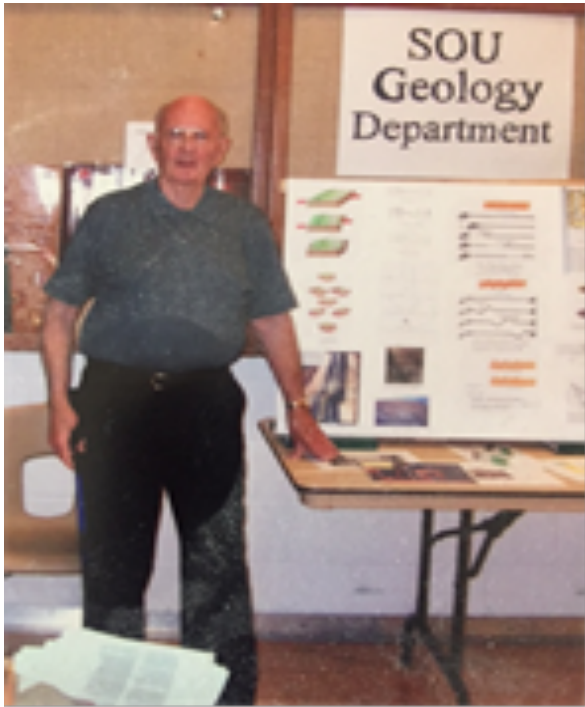
Fortunately, earthquakes are rare in Oregon, but we are in a window of a potentially large event. Just being **aware** of the possibility of a large earthquake and considering your actions will help you, your family and friends survive to help others and not be victims.

### Some useful web sites and references for more information:

- Oregon Dept. of Geology & Mineral Industries:  
<http://www.oregon.gov/dogami/Pages/index.aspx>
- Oregon Emergency Management:  
[www.oregon.gov/OMD/OEM/pages/plans](http://www.oregon.gov/OMD/OEM/pages/plans)
- Oregon Emergency Management – “Living on Shaky Ground”  
[https://www.oregon.gov/oem/Documents/15022\\_OEM\\_Shaky%20Ground\\_2018%20v4.pdf](https://www.oregon.gov/oem/Documents/15022_OEM_Shaky%20Ground_2018%20v4.pdf)
- Oregon Public Broadcasting: “Oregon Unprepared” – a series of several Earthquake videos. <https://www.youtube.com/watch?v=-n6FxBNNO4> Includes a 6 min. “Trailer” version  
[https://www.youtube.com/watch?v=g3NICXA6\\_kE](https://www.youtube.com/watch?v=g3NICXA6_kE)
- Red Cross: <http://www.redcross.org/prepare/disaster/earthquake>
- U.S. Geological Survey: <http://earthquake.usgs.gov/learn/>
- USGS Earthquake Early Warning web site: [www.Shakealert.org](http://www.Shakealert.org)
  
- Goldfinger, Chris. Oregon State University. “Ted Talk” (Excellent!)  
<https://www.youtube.com/watch?v=ly5a2P3zXI4>
- Goldfinger, Chris. Oregon State University Report 2012:  
<http://oregonstate.edu/ua/ncs/archives/2012/jul/13-year-cascadia-study-complete-%E2%80%93-and-earthquake-risk-looms-large>
- Goldfinger, Chris. OSU Cascadia Report update. August, 2016:  
<http://oregonstate.edu/ua/ncs/archives/2016/aug/subduction-zone-earthquakes-oregon-washington-more-frequent-previous-estimates>
- New Yorker Magazine 7/20/15:  
<http://www.newyorker.com/magazine/2015/07/20/the-really-big-one>
- *Cascadia’s Fault*. Thompson, Jerry. 2011. Counterpoint Press.  
A book covering the research and gathering of information leading to the current knowledge of the history and implications of earthquakes related to the Cascadia Subduction Zone.
- Jackson County Citizen Alert sign-up:  
<https://jacksoncountyor.org/emergency/Resources/Citizen-Alert>

For more information contact: Eric Dittmer (541) 941-1572

*\* Provided in honored memory of Dr. Harry Smedes, original co-author, geologist and wonderful, caring friend who passed away May 22, 2015*



Revised March, 2021