

The Nisqually Earthquake

February 28, 2001

“We cannot prevent earthquakes, but we can learn to live with them and to survive them. When the inevitable earthquake strikes, we can be ready. But today, we are not.”

ROBERT S. YEATS, Professor Emeritus in the Geosciences Dept., Oregon State University
Author of *Living with Earthquakes in the Pacific Northwest*

It’s only in the past two decades that scientists have begun to piece together the region’s violent past and the future of earthquakes in the Pacific Northwest. What is known is that the Nisqually Earthquake at a 6.8 magnitude was not even close to what is predicted to be “the big one.”

The Nisqually Earthquake collapsed buildings and bridges, disrupted gas, electric, and phone service, and triggered destructive landslides. The Nisqually Earthquake injured 407 people and resulted in one death due to a heart attack. Hundreds of chimneys toppled, and buildings with foundations resting on unstable soil, and trailers and homes not tied to their foundations were shaken off their mountings during the earthquake. Damage to buildings is estimated at over \$500 million. Future earthquakes could cause catastrophic avalanches, flash floods, fires, and huge, destructive ocean waves (tsunamis). When an earthquake occurs in a populated area, it will likely cause deaths and injuries and extensive property damage.

In the aftermath of the Nisqually Earthquake we’re reminded that once an earthquake hits, it’s too late to protect one’s family, home and belongings. But there are ways to limit future earthquake damage. Sometimes only a little time and a few dollars are all you need. *When* a catastrophic earthquake might happen can not be determined. That it *will* happen is predicted by geologic experts throughout the region. Washington truly is “earthquake country.”

The checklists within will help you reduce the probability of serious injury and catastrophic expenses from an earthquake. They do not cover every hazard nor every method. Used as a guide, however, they will help you and your family survive devastating circumstances.

Home Emergency Supply Checklist

Stocking up now on emergency supplies can add to your safety and comfort after an earthquake. Emergency Kits should contain enough supplies to last at least 3 days. Keep items that you would need during an evacuation in an easy-to-carry bag.

Survival

- ☐ Water, 3 gallons per person
- ☐ First aid kit, freshly stocked
- ☐ First aid book
- ☐ Food (packaged, canned, baby food)
- ☐ Can opener, nonelectric
- ☐ Blankets or sleeping bags
- ☐ Portable radio, flashlight and spare batteries
- ☐ Essential medication and glasses
- ☐ Fire extinguisher, A-B-C type
- ☐ Food and water for pets
- ☐ Cash, coins for phones
- ☐ Axe, shovel, broom
- ☐ Adjustable wrench for turning off gas



Courtesy of Washington Dept. of Natural Resources

Sanitation Supplies

- ☐ Large plastic bags for trash and waste
- ☐ Large trash containers
- ☐ Bar soap, liquid detergent, and shampoo
- ☐ Toothpaste and toothbrushes
- ☐ Feminine and infant supplies
- ☐ Toilet paper
- ☐ Household bleach

Safety and Comfort

- ☐ Sturdy shoes
- ☐ Heavy gloves for clearing debris
- ☐ Matches in waterproof container
- ☐ Change of clothing
- ☐ Knife or razor blades
- ☐ Garden hose for siphoning and fire fighting
- ☐ Tent

Cooking

- ☐ Barbecue or camp stove and fuel for cooking
- ☐ Plastic knives, forks, spoons
- ☐ Paper plates and cups
- ☐ Paper towels
- ☐ Heavy-duty aluminum foil

Tools and Supplies

- ☐ Screwdriver, pliers, hammer
- ☐ Coil of 1/2” rope
- ☐ Plastic tape and plastic sheeting
- ☐ Toys for children

Learning How to Survive Earthquakes

Practice Drop, Cover, and Hold!

Whether you are in your home, a classroom, or a tall building, know how to protect yourself during an earthquake. Teach yourself and family members to react automatically when the shaking starts.

When an earthquake strikes:

DROP — DROP down to the floor.

COVER — Take **COVER** under a sturdy piece of furniture. If that is not possible, seek **COVER** against an interior wall and protect your head and neck with your arms. Avoid danger spots near windows, hanging objects, mirrors, or tall furniture.

HOLD — If you take cover under a sturdy piece of furniture, **HOLD** on to it and be prepared to move with it. HOLD the position until the ground stops shaking and it is safe to move.

Tips to Protect Yourself During An Earthquake

- If you’re in a **HIGH-RISE BUILDING**, and you are not near a desk or table, move against an interior wall, and protect your head with your arms. Do not use the elevators.
- If you’re **OUTDOORS**, move to a clear area, away from trees, signs, buildings, or downed electrical wires and poles.
- If you’re on a **SIDEWALK NEAR BUILDINGS**, duck into a doorway to protect yourself from falling bricks, glass, plaster, and other debris.
- If you’re **DRIVING**, pull over to the side of the road and stop. Avoid overpasses, power lines, and other hazards. Stay inside the vehicle until the shaking is over.

- If you’re in a **CROWDED STORE**, do not rush for exits. Move away from display shelves containing objects that could fall.
- If you’re in a **WHEELCHAIR**, stay in it. Move to cover, if possible, lock your wheels, and protect your head with your arms.
- If you’re in the **KITCHEN**, move away from the refrigerator, stove, and overhead cupboards.
- If you’re in a **STADIUM or THEATER**, stay in your seat and protect your head with your arms. Do not try to leave until the shaking is over. Then leave in a calm, orderly manner.

Be prepared for **AFTERSHOCKS**, and plan where you will take cover when they occur. Aftershocks can occur in the first hours, days, weeks, or even months after the quake. Be prepared to take cover.

For Information

To learn more, call:

Washington State

Emergency Management Division

at (800) 562-6108, or visit our Web site at:
www.wa.gov/wsem

Or contact your:

Local Emergency Management Office



Washington Military Department Emergency Management Division

Camp Murray
Washington 98430-5122

George Crawford

Earthquake Program Manager

Barbara Thurman

Public Education Program Manager

Nisqually Earthquake 6.8

Preparing for Future Earthquakes
Lessons Learned
Protecting Your Family
Protecting Your Home
Protecting Your Business
Helping Neighbors



Washington Military Department, Emergency Management Division

Courtesy of Washington DNR

Lessons Learned

- 1 **Aggressive planning and training in schools was clearly evidenced by children knowing what to do when the shaking began.**
- 2 **A significant number of adults did not protect themselves by properly carrying out the **DROP COVER, AND HOLD** procedure.**
- 3 **Proactive mitigation planning and implementation paid off.**
- 4 **Establishing and enforcing seismic building codes reduced structural damage.**
- 5 **Business disruption, for the most part, was due to insufficient reduction of nonstructural hazards in the work place.**
- 6 **Incorrect public perception of building damage, and impassable street access, caused significant loss of revenue to local businesses.**
- 7 **The creation of public and private partnerships to protect Washington state citizens increased public safety and reduced property damage.**



Courtesy of Washington Dept. of Natural Resources

Checklist for Homeowners

- Consider having your home evaluated by a structural design engineer. Ask about home repair and strengthening tips for porches, front and back decks, sliding glass doors, canopies, carports, and garage doors.
- Check to see if your house is bolted to its foundation. Homes bolted to their foundations are less likely to be severely damaged during earthquakes. Homes that are not bolted have been known to slide off their foundations, and many have become uninhabitable.
- Is the chimney properly secured? Masonry chimneys pose a real hazard, especially the freestanding section above the roofline. Have the chimney inspected by a professional to determine the best method to secure it.
- Anchor fuel tanks and wood-burning stoves securely to the floor. Fuel oil and propane tanks can slide or overturn, rupturing the tank or breaking the supply line and causing a fire. Have flexible hose connections installed between the tank and supply line, and where the supply line enters the house.
- Repair any deep cracks in ceilings or foundations.
- Repair defective electrical wiring and leaky gas connections. These are potential fire risks.
- Consider purchasing an emergency generator. Use only in well ventilated areas away from air intakes to the home.



Courtesy of Washington Dept. of Natural Resources

Checklist Inside the Home

- Hang pictures and mirrors away from beds, couches, and anywhere people sit. Anchor overhead light fixtures and hanging plants to the structural support above the ceiling.
- Secure televisions, computers and stereo equipment using inexpensive products, including adhesive-backed latches; nylon and elastic cords; and shelf edges to prevent items from falling.
- Wood burning and other freestanding stoves pose a fire hazard in an earthquake and should be anchored to the floor.
- Strap the water heater to wall studs. The water heater may be your best source of drinkable water following an earthquake. Protect it from damage and leaks.
- Bolt bookcases, china cabinets, and other tall furniture to wall studs. Brace or anchor top-heavy objects — these items can fall over, causing damage or severe injuries.
- Secure kitchen equipment to the floor, wall or countertop, such as stoves and ovens, built-in and countertop microwave ovens, garbage compactors, dishwashers, refrigerators and freezers, clothes washers and dryers.



Courtesy of The News Tribune

Checklist for Businesses

- Know Your Facility**
- Conduct an earthquake vulnerability analysis to determine potential damage to your building, and unreinforced masonry or concrete structures.
 - Develop a mitigation plan that addresses emergency needs, including loss of utilities, and potential business loss and recovery.
 - Identify and correct nonstructural hazards, including securing bookcases, computers, and hanging objects on walls,
- Prepare Your Staff**
- Enlist staff to participate in private/public preparedness training programs.
 - Develop a disaster management plan that incorporates all departments and personnel.
 - Provide basic first aid training to all personnel.
 - Provide emergency response training to all employees, including how to help the disabled, non-English speaking persons, and the elderly.
 - Develop personnel records that include family contacts, schools, doctors, and medical needs.



Courtesy of The News Tribune

Checklist for Neighborhoods

Being prepared is everyone's job. During the first hours or days after a disaster, essential services may not be available.

Community Planning

- Organize neighborhood education events to learn about earthquake preparedness.
- Establish a center to communicate with police, sheriff, fire and emergency services.
- Inform local emergency service offices and volunteer organizations about your neighborhood plan.
- Appoint a leader who will keep a record of neighborhood residents, skills and equipment.
- Identify persons who may require special assistance in an emergency.
- Develop a list of tools, equipment and materials available in the neighborhood.
- Organize and train teams in first aid, search and rescue, communications, firefighting and damage assessment procedures.
- Establish locations where the injured can be treated, and emergency care resources can be collected and distributed.
- Encourage households to purchase NOAA Weather Radios with an alert feature.

If you would like additional help to start a neighborhood response plan, visit:
http://training.fema.gov/EMIWeb/CERT/new_CERT/index.htm



Courtesy of The News Tribune

Checklist Before an Earthquake

- Contact your local Emergency Management Office to find out what types of hazards are most likely to occur in your community.
- Develop an earthquake plan with your family.
- Prepare disaster supply kits for your home, workplace, and vehicle.
- Pick "safe places" in each room of your home and work place. A safe place could be under a sturdy table or desk or against an interior wall away from anything that could fall. The shorter the distance to move to safety, the less likely you will be injured.
- Set aside your inhibitions and practice Drop, Cover, and Hold procedures with your family.
- Inform guests, babysitters, and caregivers of your plan. Everyone in your home should know what to do if an earthquake occurs.
- Take a first aid class and get training on how to use a fire extinguisher
- Check with your veterinarian for animal care instructions in an emergency situation.
- Talk with your insurance agent. Study locations of active faults, and if you are at risk, consider purchasing earthquake insurance.
- If you live on a coastal or inland shoreline, be familiar with tsunami evacuation routes.
- Know what emergency plans are in place at your workplace, school and day- and seniorcare center.
- Store weed killers, pesticides and flammable products in closed cabinets with child-safe latches and on lower shelves.



Courtesy of Washington Dept. of Natural Resources

"Practice... Practice... Practice"

Earthquake Drill

- Review emergency procedures with your family and co-workers every 3 months.
- Encourage your family and co-workers to participate in earthquake drills.

Practice Drop, Cover and Hold

- Practice taking cover as if an earthquake were taking place. This will make people aware of the safest places in their immediate environment.

Practice Exiting

- Practice exiting your home and work place. Walk through the possible escape routes, and periodically inspect those routes to make certain they are not cluttered, and if they could become blocked by falling debris.

Practice Shutoff

- Practice turning off electricity, gas and water at your home and office. Be sure everyone can do this quickly and safely. Know how to turn off gas, *but do not practice this step*. Once gas is turned off for any reason, only trained utility personnel should turn it back on.

Practice First Aid

- Review and practice first aid techniques. All members of the household should receive periodic first aid training.

Review Earthquake Plans

- Check and refresh the supply of emergency food and water in your survival kit.
- Check medication and first aid materials for all members of the household including the children, handicapped and elderly.
- Replenish expired supplies of food, water, medicine, fire extinguishers and batteries at least every 6 months.
- Review the responsibility of each family member after an earthquake.
- Call the designated contact person outside the area to remind them of their role.
- Review plans to pick up children and check with schools and daycare centers to ensure the family plan is still appropriate.
- Contact your neighbors and neighborhood association frequently to review earthquake plans.
- Contact your local Emergency Management Office for an update on the local emergency plan.

Checklist After an Earthquake

- If you are in a tsunami hazard area, quickly move to higher ground by following evacuation signs.
- Call 9-1-1 only for life threatening emergencies.
- Provide assistance to elderly, disabled and non-English speaking neighbors.
- Give first aid where appropriate. *Do not* move seriously injured persons unless they are in danger of further injury. Call 9-1-1.
- Evacuate and stay out of damaged buildings. Do not re-enter until declared safe by authorities.
- If you smell gas or hear a hissing sound, open windows and leave the building. Do not use matches or electric switches indoors.
- Clean up spilled medicines, bleaches or flammable liquids immediately.
- If you see sparks or broken wires, turn off the electricity at the circuit breaker, but do not step in pools of water to get to the breaker.
- If sewage lines are damaged, avoid using the toilets. If water pipes are damaged, avoid using water from the tap.
- Fire is the most common hazard due to broken gas lines, damaged electrical lines or appliances, and sparks released from fireplaces.
- Make contact with your out-of-area phone contact, but do not make local telephone calls.
- Listen to your portable radio for instructions, and location of emergency shelter and medical aid stations.



Courtesy of The News Tribune