



## Solving the Mystery of the Magnitude 9 Earthquake

### Full Mitigation Best Practice Story

#### *State-wide, Washington*

**The State of Washington** - Lewis and Clark didn't reach the coast of Washington State until November 1805. So how do we know that a magnitude 9 earthquake occurred in the Seattle area on January 26, 1700? Amazingly, the remains of dead, saltwater-flooded forests along coastal Washington and widespread deposits of sand high in coastal estuaries suggesting tsunami inundation, along with an analysis of records maintained by the Japanese on tsunamis, presented evidence to geologists that great subduction-zone earthquakes (magnitude 8 to 9) had repeatedly struck the Pacific Northwest in the past thousand years, the most recent earthquake occurring in 1700.



Hard detective work by USGS scientists on the Cascadia subduction zone and other previously unstudied crustal faults has helped residents of western Oregon and Washington understand that they live in earthquake country. Particularly in Oregon, where few earthquakes are felt, USGS research helped convince public officials to significantly revise the building codes.

Throughout the heavily urbanized Portland metropolitan region, new buildings are now designed to resist earthquake forces 50 percent larger than they were under the old code, reducing the risk to life and property in future earthquakes.

The impact of earthquake awareness can be seen in Seattle in the effects of the Nisqually earthquake. Although the ground motions were not strong enough to test new design criteria and seismic retrofits, the growing earthquake awareness helped significantly reduce non-structural losses.

For example, at The Little Church on The Prairie Learning Center, this awareness played an important part in keeping people safe. Some months before the earthquake, volunteers worked with FEMA hazard mitigation officials to make sure the daycare center would be safe from shaking effects of an earthquake. Mitigation measures included bolting cribs to the walls and strapping water heaters, television sets, and computers in place.

When the Nisqually earthquake struck, the children and staff at the Center were protected from falling objects. According to Pat Ivy, Director of the Center, "nothing fell over because of our preventative measures. It was amazing."

#### Activity/Project Location

Geographical Area: **State-wide**

FEMA Region: **Region X**

State: **Washington**

### Key Activity/Project Information

Sector: **Public/Private Partnership**  
Hazard Type: **Earthquake**  
Activity/Project Type: **Training**  
Activity/Project Start Date: **02/2001**  
Activity/Project End Date: **Ongoing**  
Funding Source: **National Earthquake Hazards Reduction Program (NEHRP)**

### Activity/Project Economic Analysis

Cost: **Amount Not Available**  
Non FEMA Cost:

### Activity/Project Disaster Information

Mitigation Resulted From Federal  
Disaster? **Unknown**  
Value Tested By Disaster? **Unknown**  
Repetitive Loss Property? **Unknown**

### Reference URLs

Reference URL 1: [http://www.fema.gov/plan/prevent/earthquake/sty\\_mag9.shtm](http://www.fema.gov/plan/prevent/earthquake/sty_mag9.shtm)  
Reference URL 2: [http://www.fema.gov/plan/prevent/bestpractices/NEHRP\\_BP\\_page.shtm](http://www.fema.gov/plan/prevent/bestpractices/NEHRP_BP_page.shtm)

### Main Points

- Throughout the heavily urbanized Portland metropolitan region, new buildings are now designed to resist earthquake forces 50 percent larger than they were under the old code, reducing the risk to life and property in future earthquakes.
- The impact of earthquake awareness can be seen in Seattle in the effects of the Nisqually earthquake.
- Growing earthquake awareness helped significantly reduce non-structural losses.