

2001 Nisqually Earthquake

On February 28, 2001, a major earthquake occurred near Nisqually, WA. The 32-mile-deep, magnitude-6.8 earthquake shook the ground for about one minute and was felt widely in the Puget Sound region and beyond. The earthquake caused several billions of dollars in damage to buildings and infrastructure, including the SR99 viaduct in Seattle and the Capitol Building dome in Olympia. Unreinforced masonry buildings (URMs) experienced the highest rates of structural damage, such as wall collapse and falling bricks. After the earthquake, geoscientists documented landslides, liquefaction, and lateral spread, largely in the areas with the strongest shaking.



Lateral spread across a path at Capitol Lake, Olympia. Photo by Karl Wegmann (DNR)

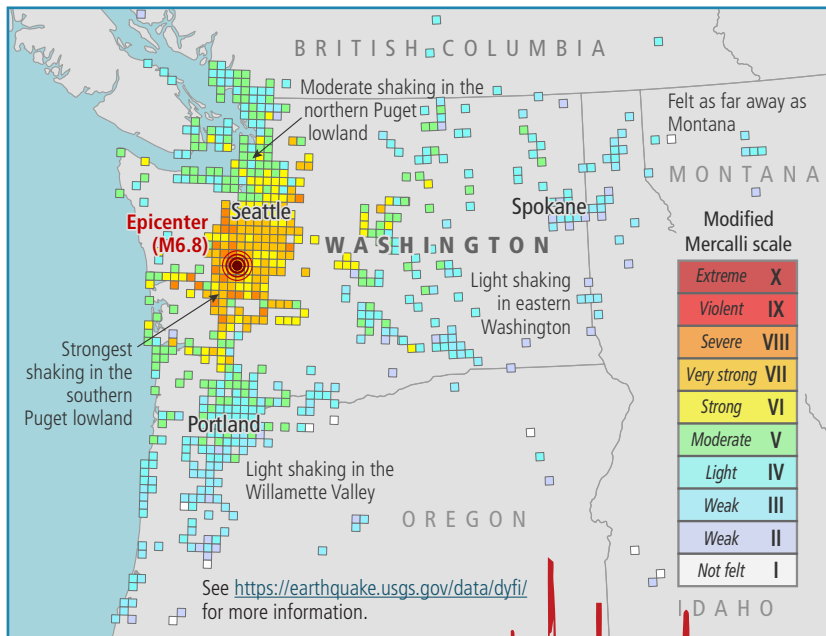


URM brick wall failure at historic Cadillac Hotel, Seattle. Photo by A. Sanli and M. Celebi (USGS), S. Akkar (METU)



Landslide on U.S. 101 northwest of Olympia. Photo by Karl Wegmann (DNR)

Where Was It Felt?

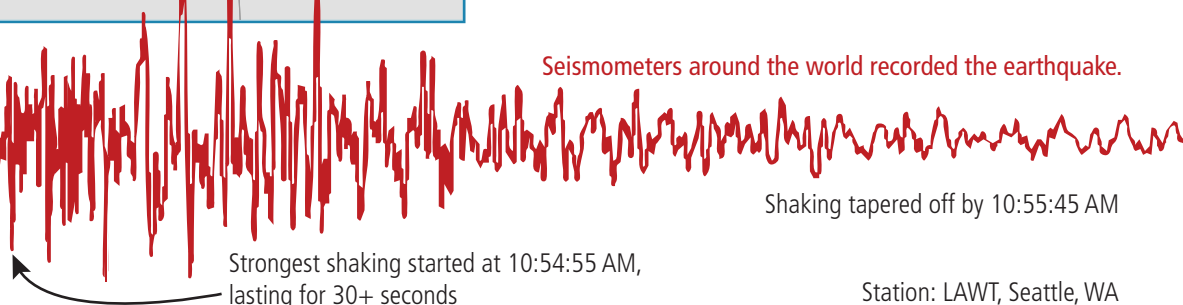


The earthquake was felt widely across the Pacific Northwest. The U.S. Geological Survey (USGS) collected 10,723 reports of shaking through the *Did You Feel It?* web survey. Respondents noted strong to severe shaking in the southern Puget lowland, moderate to light shaking in the northern Puget lowland and along the Washington coast, and light to weak shaking as far away as central Oregon and western Montana.

The shaking people felt differed depending on factors such as how far they were from the epicenter, what type of soil they were on, or the building they were in. Earthquake intensity, as shown in this map, describes those differences in how strong the ground shakes using a system called the Modified Mercalli scale.

Seismogram

Shaking started gradually at 10:54:47 AM



Earthquakes in Washington

There are three types of damaging, tectonic earthquakes that occur in the Pacific Northwest: **subduction megathrust**, **deep intraplate**, and **shallow crustal**. Nisqually was a **deep intraplate earthquake** (typical depth 25–40 miles). These **deep earthquakes** occur below North America in the downgoing Juan de Fuca plate. Earthquakes occur here because the plate bends and deforms as it descends into the mantle. Seismic energy from **deep earthquakes** dissipates as it travels to the surface, resulting in moderate shaking, while **shallower earthquakes** produce stronger shaking for a given magnitude. All three types pose a major hazard, but **deep intraplate earthquakes** are the most frequent type in this region.

	subduction megathrust	deep intraplate	shallow crustal
depth	less than 20 miles	25–40 miles	less than 20 miles
recurrence interval	~500 years	~25 years	~265 years
maximum magnitude	~M9	~M7	~M7.5
last major event	Jan. 26, 1700 (Cascadia, M8.7–9.2)	Feb. 28, 2001 (Nisqually, M6.8)	Dec. 14, 1872 (Entiat, M6.5–7)

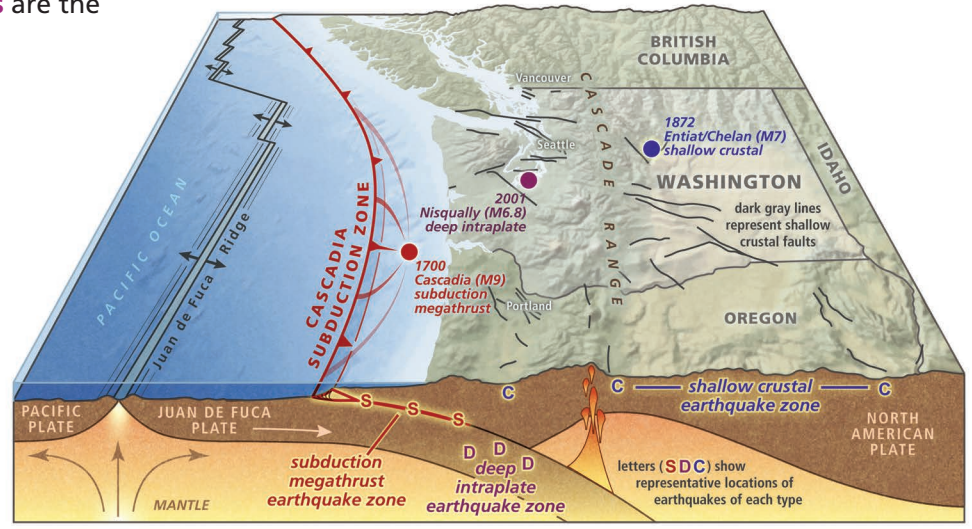
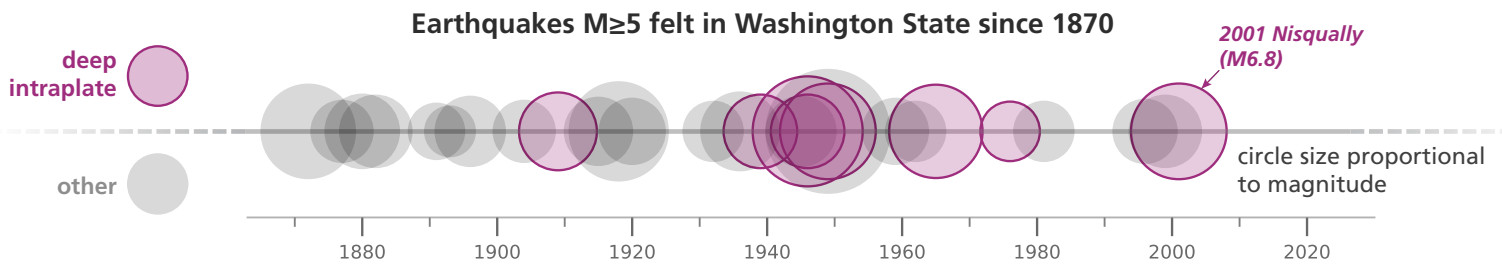


Table shows recurrence intervals for Puget Sound region, from: Wirth and others, 2025, Earthquake probabilities and hazards in the U.S. Pacific Northwest: USGS fact sheet 2025-3050. <https://doi.org/10.3133/fs20253050>

Earthquake History

Washington has experienced many large earthquakes, but the years since 2001 have been relatively quiet. Scientists estimate an 85% probability of a deep intraplate earthquake $M \geq 6.5$ occurring within the next 50 years.



Get Ready

- Practice *Drop, Cover, and Hold On*, so you're ready when shaking starts.
- Prepare your home for earthquake shaking by securing heavy items and seismically retrofitting.
- Get *2 Weeks Ready* with supplies like food, water, and medicine.

Washington Geological Survey: <https://dnr.wa.gov/earthquakes-and-faults>

Earthquake early warning: <https://www.shakealert.org>

Washington Emergency Management Division: <https://mil.wa.gov/earthquake>

Pacific Northwest Seismic Network: <https://PNSN.org>

