Northwest at risk of megaquake like one in Chile

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In this Sunday, Feb. 28, 2010 file photo, people walk past a collapsed building in Concepcion, Chile. The disaster in Chile has brought new attention to an undersea fault along the Pacific Northwest capable of producing the same type of mega earthquake and inflicting heavy damage on bustling cities like Seattle, Portland and Vancouver. (AP Photo/ Natacha Pisarenko)

(AP) -- Just 50 miles off the Pacific Northwest coast is an earthquake hotspot that threatens to unleash on Seattle, Portland and Vancouver the kind of damage that has shattered Chile.

The fault has been dormant for more than 300 years, but when it awakens - tomorrow or decades from now - the consequences could be devastating.

Recent computer simulations of a hypothetical magnitude-9 quake found

that shaking could last 2 to 5 minutes - strong enough to potentially cause poorly constructed buildings from British Columbia to Northern California to collapse and severely damage highways and bridges.

Such a quake would also send powerful tsunami waves rushing to shore in minutes. While big cities such as Portland and Seattle would be protected from severe flooding, low-lying seaside communities may not be as lucky.

The Pacific Northwest "has a long geological history of doing exactly what happened in Chile," said Brian Atwater, a geologist with the U.S. Geological Survey and University of Washington. "It's not a matter of if but when the next one will happen."

The last one hit in 1700, a magnitude-9 that sent 30- to 40-foot-tall tsunami waves crashing onto the coast and racing across the Pacific, damaging Japanese coastal villages.

There's an 80 percent chance the southern end of the fault off southern Oregon and Northern California would break in the next 50 years and produce a megaquake, according to Chris Goldfinger, who heads the Active Tectonics and Seafloor Mapping Laboratory at Oregon State University.

Research presented last year at a seismology conference found that Seattle high-rises built before 1994, when stricter building codes took effect, were at high risk of collapse during a superquake.

Disaster managers in Oregon and Washington are aware of the risks, and work is ongoing to shore up schools, hospitals and other buildings to withstand a seismic jolt.

"We're definitely being proactive in trying to get those fixed, but we

have a long way to go," said Yumei Wang, geohazards team leader with the Oregon Department of Geology and Mineral Industries.

Oregon has 1,300 schools and public safety buildings that are at high risk of collapse during a major quake. The state recently doled out $15 million to two dozen schools and emergency facilities to start the retrofit process. State law requires that all poorly built public safety buildings be upgraded by 2022 and public schools by 2032.

The state is also helping its coastal communities - home to 100,000 residents - plan for vertical evacuation buildings that could withstand giant tsunami waves.

Seattle plans to retrofit its 34 fire stations. The city is also working on a plan to upgrade 600 buildings considered most at risk.

"We have been preparing aggressively," said Barb Graff, who heads the city's Office of Emergency Management.

Chile and the Pacific Northwest are part of several seismic hotspots around the globe where plates of the Earth's crust grind and dive. These so-called subduction zones give rise to mountain ranges, ocean trenches and volcanic arcs, but also spawn the largest quakes on the planet.

The magnitude-8.8 Chile quake occurred in an offshore region that was under increased stress caused by a 1960 magnitude-9.5 quake - the largest recorded in history, according to geologist Jian Lin of the Woods Hole Oceanographic Institution.

The temblor destroyed or badly damaged 500,000 homes and killed more than 700 people.

Similar tectonic forces are at play off the Pacific Northwest, where the

Juan de Fuca plate is diving beneath North America. At some point, centuries of pent-up stress in the Cascadia subduction zone will cause the plates to slip. Scientists cannot predict when a quake will occur, only that one will happen.

The region is all too familiar with violent earthquakes. In 2001, a 6.8-magnitude quake centered near Olympia, Wash., rattled a swath of the Pacific Northwest, but remarkably caused no deaths. While it was not the type of quake that hit Chile, it was a reminder of how a big disaster could strike at any time.

To better understand megaquakes, a group of scientists planned to travel to Chile in May for a conference on giant earthquakes and their tsunamis. There are field trips planned to commemorate the 50th anniversary of the 1960 Chile quake.