Take note, Northwest: Offshore quake here would create a tsunami like this

Northwesterners should pay close attention to the tragedy unfolding in Japan because the same thing is headed our way, scientists say.

By Sandi Doughton
Seattle Times science reporter

Relief and dread mingled Friday across the Northwest after the monster earthquake and tsunami in Japan.

Though at least one person was presumed drowned and several ports damaged in Northern California and Oregon, most of the region dodged damage from the waves.

But the horrific images from Japan of pancaked buildings and ships, and homes and cars being swept away like scraps were a reminder that a quake and tsunami of the same size — or bigger — will strike here some day.

"You have to be completely unaware not to look at this earthquake and ask yourself: What would Washington do if this was us?" said Tim Melbourne, an earthquake expert at Central Washington University. "This is really an eye-opener."

The fault that ruptured off the coast of Japan is a shorter version of the Cascadia Subduction Zone that extends for 600 miles along the coasts of Washington, Oregon and California. Subduction zones are the places where geologic plates overlap, with one being forced beneath the other.

Japan's magnitude 8.9 quake was the biggest in the country's recorded history. The force was more than 1,000 times that of the Nisqually earthquake that rattled Seattle for about 30 seconds 10 years
 ago. The shaking in Japan lasted six times as long.

The last time the Cascadia fault ruptured, more than 300 years ago, scientists estimate the quake registered magnitude 9 or greater. A resulting tsunami sped across the Pacific and destroyed villages in Japan.

The Cascadia fault appears to let loose every 500 years on average, though some scientists now argue that large quakes could occur twice as often. The Japanese fault has a comparable average recurrence time, though it had been more than 1,000 years since its last big slip.

"They're pretty darn similar," said Tom Jordan, professor of geophysics at the University of Southern California and director of the Southern California Earthquake Center.

Unlike many areas hit by recent quakes, Japan sets the standard for preparedness. That makes the level of damage even more sobering for coastal communities in the Northwest that have only recently developed warning systems and evacuation plans, Melbourne said.

"They are far better prepared than we are."

A high-tech tsunami-warning system developed after the Indian Ocean quake and tsunami of 2004 worked well to let people in Hawaii and along the U.S. West Coast know what to expect.

But the system is of little benefit to people who live close to a fault — whether in Japan or in the Northwest.

Coastal communities in Japan were slammed by water surges within minutes of the quake. The same thing will happen along the Washington and Oregon coasts when the next megaquake strikes here.

The best advice experts can offer folks in those communities is still pretty basic: When the ground shakes, get to high ground. (A Cascadia quake is unlikely to trigger tsunamis within Puget Sound, though communities along the Strait of Juan de Fuca could be affected.)

Tsunami alerts were issued about eight hours before the surges reached the West Coast. The warnings are based partly on sophisticated computer models developed by scientists at a National Oceanic and Atmospheric Administration (NOAA) lab in Seattle.

Researchers raced to the lab shortly after the quake, and worked around the clock to produce maps that estimate water levels around the Pacific basin.

Oceanographer Marie Eble arrived at 11 p.m. Thursday and was still sorting through tide-gauge data Friday afternoon. "This is certainly the biggest test of the system yet," she said.

Real-time measurements of water levels from a network of 50 tsunami buoys across the Pacific help the scientists fine tune their projections, Eble explained. Two buoys off the Japanese coast detected the tsunami wave within less than 10 minutes of the quake.

The models accurately predicted most tsunami levels, including the 8-foot surges that largely destroyed the harbor at Crescent City, Calif.

The small community is a "magnet" for tsunami damage, because of its location and offshore topography that channels wave energy, Eble said. The orientation of the harbor also traps water and maximizes the sloshing, said research scientist Burak Uslu.

In 1964, 11 people were killed in Crescent City by a tsunami generated by a quake in Alaska. The harbor was also damaged by a 2006 tsunami from a quake in the Kuril Islands.
Waves were much smaller along most of the coast, and they also arrived at low tide.

"That was lucky," said lab director Eddie Bernard.

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