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Big earthquake coming sooner than we thought, Oregon geologist says

Posted by Lori Tobias, The Oregonian April 19, 2009 21:32PM

The good news: New research is giving scientists a better handle on when the big one might strike the Pacific Coast.

The bad news: It probably will be sooner than we thought.

"The amount of devastation is going to be unbelievable," says Rob Witter, coastal geologist with the Oregon Department of Geology and Mineral Industries. "People aren't going to be ready for this. Even if they are prepared, they are going to be surprised by the level of devastation."

Witter spoke last week about the latest in earthquake and tsunami studies -- it's Earthquake and Tsunami Awareness Month -- as part of state and local efforts to educate the public on preparing for a megaquake of magnitude 9 or more. Witter and James Roddey, spokesman for the state agency, also will give a public talk Tuesday in Newport.

Witter says scientists are now in wide agreement that there's a 10 to 14 percent chance a powerful earthquake and tsunami will strike the Oregon coast in the next 50 years.

Why do they think that? The latest findings come from Chris Goldfinger, director of the Active Tectonics and Seafloor Mapping Lab at Oregon State University, Roddey says. But to understand Goldfinger's work, Roddey goes back to what he calls "one of the great scientific detective stories of the 20th century."

Twenty-five years ago, scientists didn't think the Cascadia subduction zone -- a place 50 to 75 miles off Oregon where two of the Earth's plates meet, one sliding under the other -- could produce earthquakes.

That changed after Brian Atwater, a renowned geologist with the U.S. Geological Survey, began in the mid-1980s to study earthquakes, eventually tracing a theory all the way to Japan, Roddey says.

Atwater studied a "ghost forest" -- dead trees in a tidal marsh -- by the Copalis River in Washington, and theorized that a megaquake had killed the cedars. But he needed more evidence.

That came when Japanese researchers published a paper in 1996 about a tsunami that struck Japan on Jan. 27, 1700. Atwater



Oregon Department of Geology and Mineral Industries

Rob Witter, coastal geologist with the Oregon Department of Geology and Mineral Industries, looks for possible sand deposited by a tsunami in bog of Sitka spruce near Ecola Creek outside Cannon Beach. He was with a video crew from Oregon Public Broadcasting's "Oregon Field Guide" for a story that will air in October.

Tuesday talk

What: Rob Witter and James Roddey from the Oregon Department of Geology and Mineral Industries will explore Native American legends, new geologic discoveries and an earthquake detective story.

When: 6 p.m. Tuesday

Where: Newport City Hall Council Chambers, [169 S.W. Coast Highway](#)

How to prepare for the big one

Discuss: Sit down with your family and put together an emergency plan. Find information at www.ready.gov

Build: Put together an emergency kit with nonperishable food, water, medical supplies, extra prescriptions, warm clothing and provisions if you need to leave your

was so intrigued that he learned the language and traveled to Japan.

In 2003, he and a team of Japanese researchers published the book "The Orphan Tsunami" about their theory that the last megaquake struck the Oregon coast Jan. 26, 1700, spawning the tsunami that washed over Japan hours later.

"This was the final puzzle piece that convinced everyone we had the potential for great earthquakes," Roddey says. Work to understand just how great has gone on ever since.

Enter Goldfinger, the OSU researcher. "Chris has been able to go back 10,000 years, and by studying offshore landslides, he found that we've had about 20 of these magnitude9-plus subduction zone earthquakes where the whole 600-mile-long fault ruptures," Roddey says.

Then he found 18 other quakes magnitude8 to 8.5 in the southern part of the subduction zone. "So instead of 20 subduction zone earthquakes, we're up to 38," Roddey says.

And, Witter says, instead of thinking giant quakes occur every 500 years, Goldfinger's work puts the cycle at 300 to 350 years.

"We've almost doubled the probability of these events happening," Roddey says. "It just gives a whole lot more urgency to educate the folks at the coast that, 'Hey, you got to get ready.'"

Native Americans, Roddey says, have known this for centuries. Inhabiting the coast for 10,000 years, they passed stories of big quakes from generation to generation.

"They created a cultural tradition by retelling these events and legends," Roddey says. "We see that around the world. When the Sumatra earthquake struck (the Indian Ocean), the Andaman Islands were right in the middle of the rupture zone. There was huge ground shaking, but very few people died from the tsunami because they had also created this culture of awareness. They went to high ground. They survived the event."

Though the Sumatra and Cascadia subduction zones differ, Witter says, a tsunami here would be much the same.

"The geology and numerical models predict tsunamis could reach as high as 80 to 100 feet in Oregon, which is similar to the tsunami that struck Sumatra," Witter says. "We need to be very cautious and prepare for that event. It may not happen in a person's lifetime, but if it does, it's going to be equivalent to a Katrina-like event."

That doesn't mean we need to live in fear, though.

"Once you get prepared and you know where high ground is, once you've talked to your family about an emergency plan and talked about all those kinds of things, you've done your homework. You don't have to think about it again."

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home. Arrange an out-of-state contact for everyone in case family members are separated.

Know: If you're on the coast, know where high ground is from home and places you frequent.

Drop, cover and hold: Practice dropping under a sturdy desk or table and hanging on; during a quake, you'll be less likely to be hurt by falling objects. If you can't get to furniture, go to a corner away from windows and cover your head.

Source: James Roddey