

Catastrophic tsunami possible on West Coast

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The type of devastating tsunami that struck the southern coast of Asia is entirely possible in the Pacific Northwest of the United States, but might not cause as much loss of life there because of better warning systems, according to experts at Oregon State University.

OSU is home to the Tsunami Wave Basin at the Hinsdale Wave Research Laboratory, one of the world's leading research facilities to study tsunamis and understand their behavior, catastrophic effects and possible ways to reduce the destruction they can cause.

As the death tolls rises into the tens of thousands in Asia and the number of homeless above one million, OSU experts say many of the same forces that caused this disaster are at work elsewhere on the Pacific Ocean "ring of fire," one of the most active tectonic and volcanic regions of the world.

This clearly includes the West Coast of the U.S. and particularly the Pacific Northwest, which sits near the Cascadia Subduction Zone. Experts believe, in fact, that it was a subduction zone earthquake of magnitude 9 – almost identical in power to the sub-sea earthquake that struck Asia on Monday – that caused a massive tsunami around the year 1700 that caused damage as far away as Japan. And the great Alaska earthquake in 1964 caused waves that swept down the Northwest coast, causing deaths in Oregon and northern California.

"The loss of human lives from this latest tsunami is staggering," said Harry Yeh, an internationally recognized tsunami expert and the

Edwards Professor of ocean engineering at OSU. "We have to ask, 'why?' Clearly, they didn't have the same kinds of warning systems that we have on the West Coast of the U.S. That is why the research that we do here is so important. As tragic as the event is, it also represents a learning opportunity and we have a responsibility to learn from it what we can.

"We didn't learn what we could have from the Alaska event," Yeh added, "because we didn't have the instrumentation we have today, and we didn't have the knowledge base. The tsunami event this weekend also happened during the daytime, so there are a lot of pictures and video of the devastation, which will help the research effort. Most of the other recent major events happened at night."

Robert Yeats, professor emeritus of geosciences at OSU, agrees that the reason for the great loss of life in Sri Lanka, India, and other Asian countries was the lack of a tsunami warning system.

"That much loss of life wouldn't happen here for either a local or distant tsunami because of warning systems operated by the National Oceanic and Atmospheric Administration, with laboratories in Newport and Seattle," Yeats said. "NOAA would record the earthquake on seismographs and issue bulletins about the progress of a tsunami. Deep-ocean buoys off the Aleutian Islands and Cascadia would also record the passage of tsunami waves in the open ocean."

For a tsunami caused by a Cascadia earthquake, people on the coast would have about 15 minutes to get to high ground, Yeats said. Emergency managers of coastal counties have told residents about planning escape routes from a tsunami, and schools in Seaside, Ore. have had tsunami evacuation drills. Some coastal communities also give warnings through a siren for those vacationers who aren't keeping up with the news. Visitors to the coast should look for the blue and white

tsunami warning signs on Highway 101 and some beach areas.

Research on tsunamis is being greatly enhanced by the new Tsunami Wave Basin at OSU, a \$4.8 million facility with advanced technology built with the support of the National Science Foundation. It allows scientists from anywhere in the world to conduct experiments and monitor results. It also helps them learn about how tsunamis behave in different types of ocean terrain and what effects they might have once they reach land, said Dan Cox, an associate professor of engineering who directs the facility.

"The underlying goal of all we are doing is to ultimately reduce the loss of lives," Cox said. "We've had a number of scientists from Japan and throughout the United States checking in with us already, and we expect more from around the world.

"We're not working alone," Cox added. "Much of our work is in collaboration with NOAA's Pacific Marine Environmental Laboratory, and the support of the National Science Foundation has been critical. They've funded the construction of the facility during the past four years, and will support the operation and maintenance of it for the next 10 years."

Is it possible that a tsunami will strike the U.S. during that time? Experts are not sure.

"In the Pacific Northwest, there is no way to tell whether the next Cascadia earthquake will strike tomorrow or 100 years from now," Yeats said. "We must prepare for the worst case scenario, both in tsunami escape preparations and in not building in potential tsunami inundation zones."

One of Yeats' colleagues is Chris Goldfinger, who has spent years

studying the Cascadia subduction zone. Goldfinger says that in the last 10,000 years, there have been 19 major earthquakes in the zone that runs from northern California to Vancouver Island.

"There are only a few places in the world with a pattern long enough that we can study," he said, "and one of them is Cascadia. We cannot accurately predict earthquakes, so we have to look to the past for patterns."

Yeh said the weekend's earthquake and tsunami were grim reminders that our planet's natural forces are constantly at work – even if we forget about them.

"There is such a long period between tsunamis that people tend to forget how dangerous they are, and how devastating their impacts can be," Yeh said. "People in this country forgot about hurricanes for several years before Hurricane Hugo, and this year's series of storms focused people's attention on them again. The lag time for tsunamis is even greater. But the threat is still very real, as we learned."

Source: Oregon State University

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