

Study: Subduction zones quakes more frequent than previous estimates

MIKE McINALLY, Corvallis Gazette-Times News, 8-5-16

A new study from Oregon State University researchers and colleagues worldwide shows that massive earthquakes along the Cascadia subduction zone have occurred somewhat more frequently than has been believed in the past.

The study, based on examination of considerably more core samples than were used in previous studies, also concluded that the chances of a major earthquake occurring along the zone in the next 50 years are slightly higher than researchers had believed.

Chris Goldfinger, a professor in OSU's College of Earth, Ocean and Atmospheric Sciences, said he and colleagues from Camosun College in British Columbia and Instituto Andaluz de Ciencias de la Tierra in Spain were able to examine nearly 200 core samples for the new study for evidence of earthquake activity in the past. Previous studies had used just 20 or so samples.

In some cases, he said, the core samples examined were some 40 years old but still in perfect condition.

The idea is to use the core samples from different locations to estimate the frequency and severity of earthquakes generated from the Cascadia subduction zone, a fault line that runs off the West Coast from Northern California to British Columbia. The zone is roughly divided into four segments, and the new study primarily focused on the northern section, from Newport to Vancouver Island. (The study was published this week in the journal *Marine Geology*.)

The previous estimate was that the section of the zone from Newport to Astoria ruptured on average every 400 to 500 years. The new study revised that estimate, Goldfinger said: Researchers now believe that average is about every 350 years.

A section of the zone that runs from Astoria to Vancouver Island was believed to have ruptured every 500 to 530 years; the new study has reduced that estimate to once every 430 years.

Because those estimates have changed, so have the chances that a major quake will occur in the next 50 years. For the stretch from Newport to Astoria, the chances have risen to 15-20 percent instead of 14-17 percent.

For the portion of the zone off the Washington coast, the chances are now set at 10-17 percent, revised upward from 8-14 percent.

Goldfinger cautioned, however, that these are just statistical figures: "You don't need to get to 100 percent to have an earthquake." And he cited the devastating Japanese earthquake that triggered a tsunami in 2011: On that day, that area had a 20 percent chance of an earthquake occurring in the next 50 years.

The southern sections of the Cascadia zone tend to rupture more frequently: The average is about every 300 to 380 years along the stretch from Newport to Coos Bay and 220 to 240 years from Coos Bay to Eureka, California.

Scientists say there have been 43 major earthquakes in the past 10,000 years along the subduction zone; some of the quakes have been along the entire zone, and some have involved just parts of it. When the entire zone is involved (and scientists say that happens about half the time), scientists believe it could result in a magnitude 9.1 quake, with an attendant tsunami.

The last major earthquake on the subduction zone occurred in January 1700.