This is not a drill: The earth actually is moving beneath western Washington

March 6 2008

While the annual Sound Shake exercise on Wednesday produced a simulated magnitude 6.7 earthquake on the Seattle fault, a real though unfelt seismic event is taking place beneath western Washington.

Earlier in the week, seismographs in the southern Hood Canal area began recording bursts of low-level shaking associated with what is called an episodic tremor-and-slip event. If this episode behaves true to form, the tremor will move north beneath the Olympic Mountains and across to Vancouver Island during the next two to three weeks.

This the fifth so-called slow-slip event to be recorded since the phenomenon was discovered in 2002, and it will be the most closely studied such event so far. University of Washington scientists and students are hurrying to deploy a special set of instruments, 100 temporary seismographs set in a close formation in the Olympic mountains, to record the current episode. The temporary stations will augment readings from the permanent seismograph network that covers all of Washington and Oregon.

"We hope to record unprecedented detail as the tremor moves beneath the seismometer array," said John Vidale, a UW professor of Earth and space sciences and director of the Pacific Northwest Seismic Network.

Slow-slip events, or silent earthquakes, occur at a depth of about 25 miles and can last for several weeks. Though they are unfelt by humans, they can release as much energy as a large earthquake.

Since they were first discovered in the Puget Sound region, such events have occurred regularly about every 14 months. The current slow-slip event was expected to start between mid-February and mid-April, and the first evidence that it had begun turned up on Sunday.

It is expected that as the tremor runs its course, GPS stations in western Washington will move ever so slightly -- about one-tenth of an inch -- to the southwest. Then they will resume their normal slow march to the northeast at a rate of about a half-inch per year as the North American plate that lies under much of the Pacific Northwest is compressed by the Juan de Fuca plate where the two meet just off the Pacific coast.

Scientists have found that the fairly continuous tremor associated with slow-slip episodes is very difficult to locate precisely using standard techniques, so they hope special processing and the use of the temporary seismic arrays will help to pinpoint the exact location and source of the tremor, as well as its relationship to earthquake faults.

Future such studies could help to determine when the region might experience major earthquakes, and provide an understanding of just how large such quakes will be, Vidale said.

Details of the current work, along with scientific commentary, can be found at www.pnsn.org/WEBICORDER/DEEPTREM/winter2008.html .

Source: University of Washington

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