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The Olympian, Olympia Washington

Friday, May 2, 2003

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Science offers seconds of warning before large-scale earthquakes hit

Measuring small tremors may give enough notice to find cover

THE ASSOCIATED PRESS

LOS ANGELES -- Scientists in Southern California have proposed a way of interpreting feeble tremors that herald a large earthquake, a step that could help in providing advance warning.

The system theoretically could give anywhere from seconds to tens of seconds of notice -- enough time to send school children diving below their desks or to cut the flow of gas through pipelines, scientists said. Details appear today in the journal Science.

The first indication at the surface that a large earthquake has occurred is typically the jolt caused by the arrival of a fast-moving but low-energy wave called the primary or P wave.

It is followed by the more energetic but slower-moving S or shear wave that causes far more violent shaking.

Richard Allen of the University of Wisconsin-Madison and Hiroo Kanamori of the California Institute of Technology developed a way to determine the location, origin, time and -- most important -- magnitude of an earthquake from as little as four seconds of measurements of the P wave.

"If we can detect this P wave and use the information contained in it to estimate the hazard associated with an earthquake, then there is the potential to issue a warning before any significant ground motion reaches the surface," Allen said.

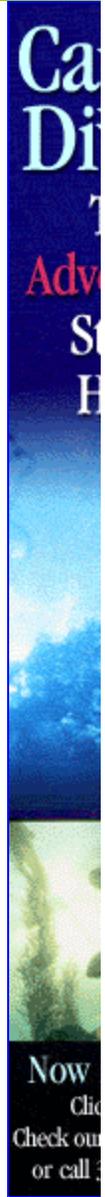
The amount of forewarning would depend on the distance of the sensors from an earthquake's epicenter. If directly above the epicenter, there would be no time for a warning, because the S wave would arrive almost immediately after the P wave. At 37 miles from the epicenter, the system could give a magnitude estimate 16 seconds before the arrival of the S wave and the strong ground motion that accompanies it, Allen said.

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