SCIENTISTS TEST NEW FAULT THEORY FOLLOWING COALINGA EARTHQUAKE

In preliminary findings following the Coalinga, Calif., earthquake of May 2, 1983, U.S. Geological Survey scientists reported they have already learned much about the source of the destructive magnitude 6.5 (Richter scale) earthquake and it's more than 1,500 aftershocks.

USGS scientists said that the fault responsible for the earthquake may be of a variety different from the well-known San Andreas fault about 20 miles west of Coalinga. The San Andreas, they noted, is a major vertical fault along which most large earthquakes occur. Movement along the San Andreas is in a horizontal strike-slip sense, the coastal block west of the fault moving relatively toward the north, so that Los Angeles moves an average of 6 inches closer to San Francisco each year.

In contrast, the May 2 earthquake and a previous magnitude 5.3 earthquake last October appear to have been generated on an ancient buried thrust fault that once separated the North American continent from the Pacific basin. This fault, the Coast Range thrust, is tens of millions of years older than the San Andreas, according to the USGS scientists. Thrust fault movement causes one block to move over the other.

Although the San Andreas fault was not directly involved in the May 2 earthquake, sensitive fault displacement (creep) meters on that fault in the Parkfield, Calif., area show a recent fault displacement of as much as 0.2 inches that may be related to the Coalinga earthquake.

The USGS has sent a team of more than 30 seismologists and geologists to the scene to gather data that will help define and provide more information on the possible causes of the earthquake. About 40 instruments have been deployed in the Coalinga area to better determine the locations and depths of the aftershocks and to better define the strike and dip of the fault surface. Surface investigations are underway not only to seek clues as to the cause and nature of the earthquake, but also to locate such effects as earthquake-induced landslides and areas of unusually heavy damage.

These efforts are being shared with investigators from the California Division of Mines and Geology and from local universities. The investigations are expected to continue for several weeks until earthquake activity wanes and the most significant new data are collected.

Preliminary results from the USGS permanent Central California Seismographic Network, which includes a station near the epicenter of the May 2 earthquake, indicate that the mainshock occurred on a northwest-trending thrust fault.

Determinations of the locations of the more than 1,500 aftershocks show that movement along the fault occurred over an elliptical zone about 20 miles long by 6 miles wide and centered around the main shock.

Most of the aftershocks have occurred below 3 miles in depth. The earthquake rupture initiated at a depth of about 6 miles beneath Anticline Ridge east-northeast of Coalinga.

The recent earthquake occurred on the extreme eastern edge of the 65-mile-wide zone of active faults that form the San Andreas system in Central California. The Coalinga region has experienced moderate earthquake activity in the past, including a magnitude 5.3 earthquake that occurred about 15 miles northwest of Coalinga on October 25, 1982. Monday's earthquake, however, was the largest to strike the Coalinga region in at least the past 100 years, the USGS said.

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