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Dallas-Fort Worth earthquakes in 2008-2009 likely man-induced

A sequence of small earthquakes that occurred at the Dallas-Fort Worth Airport between October 30, 2008 and May 31, 2009 were likely triggered by the disposal of brines accompanying natural gas production at a nearby well that had recently been completed, according to research published in the February issue of the Bulletin of the Seismological Society of America (BSSA).

Many residents of the Dallas-Fort Worth area felt small earthquakes, which had magnitudes between 2.2 and 3.3, prompting scientists to investigate. The area, home to more than four million residents, had experienced no previous earthquakes in historic times. A significant increase since 2002 in the number of permits authorizing drilling and hydraulic fracturing to promote natural gas raised the possibility of induced earthquakes.

Researchers from University of Texas at Austin and Southern Methodist University analyzed data captured by regional and temporary seismic networks, which identified more than 180 earthquakes. Because of the absence of previous historical earthquakes, the proximity of the brine disposal well, and the similarity with other documented cases of induced seismicity in Texas, the authors suggest that the injected fluid migrated to a previously inactive fault, reactivating it.

The Dallas-Fort Worth Earthquake Sequence: October 2008 through May 2009, by Cliff Frohlich and Eric Potter of University of Texas at Austin; Chris Hayward and Brian Stump of Southern Methodist University.

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Identifying large hurricanes through seismology

Storm-generated seismic signals may allow seismologists to detect large hurricanes at sea and track their intensity, adding useful data to the discussion of whether anthropogenic global warming has increased the frequency and intensity of hurricanes and tropical storms, including ones that don't reach land.

Ambient noise, or microseisms, is the pervasive background signal bathing the surface of the Earth and is not produced by earthquakes. These surface waves generated by ocean storms are detected even in continental interiors far from source regions.

Researchers at Northwestern University demonstrate that the August 1992 category 5 Hurricane Andrew can be detected using microseisms recorded at the Harvard, Massachusetts seismic station, even while the storm is as far as 1200 miles away at sea. When applied to decades of existing analog seismograms, this methodology could yield a seismically identified hurricane record for comparison to the pre-aircraft and pre-satellite observational record.

Seismological Identification and Characterization of a Large Hurricane, by Carl W. Ebeling and Seth Stein of Northwestern University.

Media contact: Carl W. Ebeling, carl@earth.northwestern.edu

Southern San Andreas quake expected soon

The Coachella Valley section of the San Andreas fault, between San Gorgonio Pass and the Imperial Valley, is the only portion of the fault which has not ruptured in a major earthquake during historical time. New paleoseismic data suggests an average recurrence cycle of 116 to 221 years, indicating that it is past the expected time for a fault rupture.

Researchers from the University of Oregon and the U.S. Geological Survey have constructed an earthquake chronology for the past 1200 years for the southernmost San Andreas fault based on a new paleoseismic investigation conducted in the city of Coachella, California. Five to seven earthquakes were identified, with the last earthquake occurring at the site approximately 320 years ago. The interval since

the last earthquake is as long or longer than every period of previous quiescence in the paleoseismic record.

This long period of quiescence suggests that an unusually large amount of elastic strain has built up along the southern San Andreas segment, making it likely to produce a large to great (Mw7-8) earthquake in the near future.

San Andreas Fault Earthquake Chronology and Lake Cahuilla History at Coachella, California, by Belle Philibosian of Caltech, Thomas Fumal of U.S. Geological Survey and Ray Weldon of University of Oregon.

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