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Destruction and Tsunami After Plates Collide Again

By CORNELIA DEAN AUG. 17, 2007

The earthquake that struck off Peru's southern coast on Wednesday occurred in one of the world's most active geological areas, where the South America plate collides with the Nazca plate, which underlies part of the Pacific Ocean.

These tectonic plates are among more than a dozen that form earth's rigid shell — converging, sliding along or pulling away from one another in movements driven by heat from the planet's interior.

The Nazca plate slides under the South America plate at the rate of about three inches a year, which in geological terms is "very fast," said Harley M. Benz, a geophysicist who is in charge of the National Earthquake Information Center at Golden, Colo. As the plates move relative to one another, they steadily generate low-level quakes, most of which rarely cause damage.

But sometimes two plates' pressure against each other builds "until they cannot take it any more, and it produces these large earthquakes," he said.

That was what happened Wednesday, and the result was a quake with a preliminary

The epicenter of Wednesday's quake — the spot where its energy was strongest — was about 19 miles underground, off the Peruvian coast about 95 miles south-southeast of Lima, the geological survey reported.

The region "has one of the highest convergence rates on earth," Dr. Benz said. The geological survey said other quakes of magnitude 8 or more occurred in the area in 1908 and 1974, and there was a major quake in 1966 in northern Peru. In 2001, a magnitude 8.4 quake struck at Arequipa, Peru, south of this week's quake, killing 138 people.

The geological survey said the largest known earthquake in the region was a magnitude 9 quake in 1868 that produced a tsunami that killed several thousand people on the Peruvian coast and caused damage as far away as Hawaii.

A tsunami warning was issued immediately after Wednesday's quake, but Dr. Benz said tide gauges and other instruments did not detect any appreciable change in wave heights, and the warning was canceled.

[Agence France-Presse reported that a tsunami of about 4 inches was recorded off Japan's Pacific coast early this morning. The Japan Meteorological Agency warned that higher tsunamis could follow and issued a tsunami advisory for Pacific coast areas from Japan's northern main island, Hokkaido, to Okinawa.]

But by yesterday afternoon, seismographs had detected more than 15 aftershocks of magnitude 5 or greater, which are typical after large earthquakes, Dr. Benz said. "We are likely to record aftershocks from this event for weeks and months from now," he said.

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