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Quake Occurred Along Fault Said to Be Among Area's Most Dangerous

By Kenneth Reich
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Sunday's 4.2 earthquake that shook large parts of Los Angeles appears to have involved the north end of the Newport-Inglewood fault, one of the most dangerous in Southern California, three leading quake scientists said Monday.

The Newport-Inglewood fault, beginning just off the Orange County coast and extending 50 miles northwest through Long Beach, Inglewood and into West Los Angeles, is believed capable of generating a quake in the magnitude 7 range and has been the subject of dire quake scenarios because it runs directly under some of the most densely populated areas of Southern California.

Movement along the southern part of the same fault caused the 1933 Long Beach quake, a 6.3 temblor centered off Newport Beach that killed 115 people, mainly in Long Beach and Compton. That was the second-largest number of fatalities in a California temblor in recorded history. Damage to school buildings caused by that quake led to major steps toward earthquake-resistant construction in the state.

By contrast, although Sunday's quake was the largest in the immediate vicinity in many years, it still has to be considered a small event, said James F. Dolan, a quake scientist at USC.

"It was felt so strongly because it was so shallow," Dolan said. "The 4.2 means a rupture of only about 500 meters in diameter, a very small area. Compare that with the 1857 quake on the San Andreas, which ruptured about 4,000 square kilometers."

A rupture is the section of fault line where the earth slips, causing a quake.

Sunday's earthquake was located near the intersection of the Newport-Inglewood and Hollywood faults, said seismologists Egill Hauksson and Kate Hutton of Caltech. But because the Newport-Inglewood is at a shallower depth and runs in a direction consistent with the focus of the quake, and the Hollywood fault does not, the Newport-Inglewood fault is the most likely culprit, they said.

The quake caused horizontal movement that occurred on a north-northwest striking plane near West Hollywood. That was also the orientation of several small aftershocks, the scientists said.

Robert S. Yates, a seismologist at Oregon State University, agreed. Sunday's quake was "a Newport-Inglewood strike-slip type event," he said.

The epicenter of the quake appears to have been about 2 1/2 miles below the corner of Beverly and La Cienega boulevards. Such locations can be half a mile off in any direction, Hauksson said Monday.

That location is about two miles east of what geologists have thought of as the northern end of the Newport-Inglewood fault, near Century City. But as they study recent significant quakes in Southern California, scientists have moved to the view that

faults occur more in a zone than along a narrow line.

“Broadly speaking, where the quake occurred was part of the Newport-Inglewood fault system, but not on the fault proper,” Dolan said. “We have to be hesitant to reach any sweeping conclusions,” he added, because “the rupture is a very small segment of this fault system.”

The temblor would be the largest to strike the northern segment of the Newport-Inglewood fault since a magnitude 4.9 centered in Baldwin Hills in 1920.

In 1988, the state Division of Mines and Geology set out a comprehensive scenario suggesting that a magnitude 7 temblor on the Newport-Inglewood could cause enormous damage. The model foresaw such occurrences as the blockage of the Hollywood Freeway at the over-crossings for Hollywood and Sunset boulevards, reduction of the capacity of Los Angeles International Airport to 30% for two days, the indefinite loss of 34% of all hospital beds in Los Angeles and Orange counties, the shutdown of five power plants for three days and impediments in water supplies.

Luckily, however, the interval between quakes on the fault is long. Since the Baldwin Hills quake of 1920 and the Long Beach quake of 1933, the Newport-Inglewood fault has been the cause of two 4.8 quakes, in Gardena and Torrance, in 1941.

Still, in the long sweep of geological time, a series of moderate quakes during a period of 80 years can presage a bigger quake eventually. Since the affected Los Angeles-Orange county areas contain millions of people, its consequences could be immense.

Several years ago, Risk Management Solutions, a Bay Area quake-modeling firm, estimated that damage from a magnitude 7 quake on the Newport-Inglewood could range from $125 billion to $220 billion. By comparison, damage from the Northridge quake in 1994 was about $40 billion. For reasons of taste, such scenarios do not usually estimate casualties.

Hauksson and Hutton, meanwhile, said there were some small precursors of Sunday’s quake that could only have been detected by instruments.

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