Borrego-area fault poses most trouble

Gary Robbins, San Diego Union-Tribune, 7-8-10

The San Andreas is Southern California's most famous earthquake fault. But the San Jacinto system, which produced a magnitude-5.4 temblor Wednesday near Borrego Springs, is a potentially bigger threat to the San Diego area, seismologists said.

The San Jacinto is the most seismically active fault in the region, and it has a history of generating quakes above 6.0. The 130-mile-long fault also is located closer to the more heavily populated areas of San Diego and Imperial counties. The seismic energy from Wednesday's quake reached downtown San Diego in about 16 seconds.

Here are answers to some questions about the San Jacinto fault, based on interviews with seismologists.

QUESTION: Could the San Jacinto system produce a highly damaging earthquake?

ANSWER: "Yes," said Bob Dollar, a seismologist at the U.S. Geological Survey. "A 6.0 quake that breaks close to an urban area can cause a lot more damage than an 8.0 that happens much farther away, although a huge event on the San Andreas could be catastrophic."

The San Jacinto has illustrated its might. In 1918, the fault generated a 6.8 quake that broke 70 miles north of San Diego, in the town of San Jacinto. The quake damaged most of San Jacinto's buildings and cracked the region's highways.

There also was a 6.5 quake at Borrego Mountain on April 8, 1968, that shook all of San Diego County.

QUESTION: Was Wednesday's quake an aftershock of the 7.2 Easter Sunday quake near Mexicali?

ANSWER: The Mexicali quake has produced thousands of aftershocks, and will continue to do so for years. But seismologists say Wednesday's quake on the San Jacinto fault was a separate event. There is no way of knowing whether it is a "foreshock" to a much larger event. Scientists cannot predict earthquakes.

QUESTION: Is it possible that Wednesday's quake redistributed stress on other faults, making them more likely to snap?

ANSWER: It is possible, but it is difficult to quickly get meaningful data about how much stress is building up on a specific part of a fault, and whether that stress could lead to a quake. But a quake can set off an event on another fault. The 7.3 Landers quake in 1992 triggered a 6.4 quake in the Big Bear area hours later.

One other thing: scientists say the San Jacinto fault might be physically linked to the San Andreas. So a quake on one fault could influence activity on the other.

QUESTION: Is it an ominous sign that the San Jacinto fault produced a 5.4 quake?

ANSWER: Tom Rockwell, a San Diego State University seismologist who studies the San Jacinto, said, "We don't know the answer to this, but we do know that the San Jacinto fault zone is capable of large earthquakes, and that segments of the fault are due for moderate to large earthquakes.

“Wednesday’s earthquake occurred on the Coyote Creek strand of the fault zone, which accumulates strain at the rate of a few millimeters per year. This accumulated strain is released in moderate to large earthquakes. We don’t know the timing of the last such strong earthquake along the northern Coyote Creek fault, but it has certainly been more than a century.”

QUESTION: It seems like the San Diego area has been having more earthquakes than usual. Is that the case?

ANSWER: The number of earthquakes varies greatly. But, on average, Southern California gets about 15,000 quakes a year measuring 1.0 or above. The USGS estimates that the region might have recorded as many as 10,000 so far this year. But the frequent shaking largely represents aftershock activity from the Easter Sunday earthquake.

QUESTION: How well is the San Jacinto fault understood by scientists?

ANSWER: “We know a lot about the past behavior of the fault from geologic studies,” Rockwell said. “We know a lot about its current rate of strain accumulation from geodesy. That said, we still have a lot to learn and are actively and aggressively collecting new information to better assess the faults’ short-term hazard.”