

# Overdue California quake greater than thought, report says

**Jareen Imam, CNN News, 3-13-16**

The San Andreas Fault has an infamous reputation, but there are other fault lines lying around California that can trigger a powerful earthquake, especially if they rupture simultaneously, a new report says.

A U.S. geologist discovered that the San Andreas and the San Jacinto faults may have ruptured together about 200 years ago, creating an earthquake that was felt from north of Los Angeles to San Diego, based on historical data captured by missionaries in those areas.

The San Andreas Fault, a system that stretches more than 800 miles and is about 10 miles deep, is long overdue for an eruption, one that seismologists predict will be the source of a powerful earthquake along California's coastal region. The fault is due for an epic tremor every 150 years, the U.S. Geological Survey says.

But this ominous future earthquake may be more catastrophic than initially thought, warns scientists.

Through dynamic rupture modeling, it has been discovered that the San Jacinto fault is capable of rupturing along with the San Andreas in just a single earthquake, according to Julian C. Lozos, an assistant professor of Geological Sciences at the University of California in Riverside.

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"If there's a joint rupture it will create a larger earthquake, especially if it starts on the San Jacinto," Lozos says. "Say you're stressed out and you snap. You might then stress out your friend too. That's that same way faults work. They stress each other out."

It is likely that a joint rupture happened in the past, Lozos explains in the peer-reviewed journal *Science Advances*.

Lozos theorizes that on December 8, 1812, the magnitude 7.5 earthquake, often called the San Juan Capistrano earthquake, was the result of both the San Andreas and San Jacinto faults rupturing at the same time. That quake claimed the lives of 40 people who were killed when a church crumbled onto them.

Initially, scientists thought this historic quake started at the San Andreas Fault after examining tree rings, but through computer models, Lozos found that the 1812 earthquake may have started farther south, on the San Jacinto Fault and "jumped" to the San Andreas, resulting in a powerful quake.

The findings are important because they may give scientists clues about what to expect with future earthquakes in the region. "The record of past earthquakes tells us what could happen in the future because we know it happened in the past," says Lisa Grant Ludwig, professor and graduate director in public health with the University of California in Irvine.

"This precedent carries the implications that similar joint ruptures are possible in the future and that the San Jacinto fault plays a more significant role in seismic hazard in southern California than previously considered," Lozos writes in the report as well.

But, Ludwig cautions, "Neither I, nor any other scientist can tell if this will happen in the near future," she says. We cannot predict earthquakes, and we can't do controlled experiments on earthquakes in the laboratory. We have to use the natural laboratory of the geologic and historic record of past earthquakes."

Ludwig, a Caltech Ph.D. in geology with geophysics, says Lozos' findings show why people should seriously consider the possibility of a joint rupture.

"In southern California, much of our infrastructure was built to withstand a rupture of either the San Andreas or San Jacinto faults, but not both at the same time," she says.

The double-rupture scenario is one of the many geological possibilities that could affect the West Coast.

Although the San Andreas fault has been credited as one of the most powerful quake-makers in the region, there is another fault line buried deep inside the Earth. The Cascadia subduction zone, which runs from British Columbia's Vancouver Island California's Cape Mendocino, can create an earthquake with 30 times more energy than the more famous San Andreas.