

Scientists contemplate earthquake prediction

Warning system in the works could give 60-second notice

Keith Matheny, Palm Springs Desert Sun, 9-19-10

As scientists continue to advance the understanding of how, where and why earthquakes happen, the elusive holy grail remains accurately predicting when a quake will occur.

“In terms of high-probability alerts, a statement saying, ‘In the Coachella Valley there's a greater than 50 percent chance of having a large earthquake in the next week,’ I think you're not going to see that,” said Tom Jordan, a professor of geophysics at the University of Southern California and the director of the Southern California Earthquake Center.

The center's annual meeting brought 500 scientists to Palm Springs last week.

While short-term earthquake prediction remains out of reach, what's quite possible for California's future, scientists said, is an early-warning system as a major quake occurs — providing a precious minute or so of preparation, for example, to the Los Angeles area if a “big one” began on the southern San Andreas fault near the Salton Sea.

But earthquake warnings similar to tornado warnings in the Midwest and Plains states aren't likely even looking ahead decades, said Ramon Arrowsmith, a professor of geology at Arizona State University, who attended the Palm Springs conference.

“It's tricky,” he said. “We can refine our ability to forecast. We can say these areas are like the tornado alleys. We can definitely say more and more where the earthquakes will occur, and more and more how likely they will be.”

One area under close study now is the tendency for quakes to cluster, for one major temblor to beget another, Jordan said.

That's a particularly timely topic for Southern California.

Scientists believe a magnitude 7.2 quake that occurred near the Mexican border on Easter Sunday has contributed to several large quakes in the region since. And that has them questioning whether the quakes could migrate farther north, into dangerous fault systems overdue for a quake, such as the southern San Andreas.

Historic evidence indicates a major earthquake typically occurs about every 150 years on the southern San Andreas fault, but it's been more than 300 years since the last major quake on that section of the fault.

A “big one” — an earthquake of magnitude 7.8 or greater on the southern San Andreas — would devastate a wide swath of Southern California, including the Coachella Valley.

Scientists and other experts, in a study last year, determined such a quake today might kill more than 1,800 people, injure more than 50,000 and cause more than \$200 billion in damage.

But earthquakes remain stubbornly unpredictable. A magnitude 7.0 earthquake that caused extensive damage in Christchurch, New Zealand, on Sept. 3 “was on a fault that hadn't ruptured in, we think, maybe 16,000 years,” Jordan said.

Science can provide useful predictive information in less specific ways, Jordan said. Research indicates that a moderate earthquake on faults such as the San Jacinto or San Andreas increases the probability of a subsequent, larger earthquake, he said.

“In fact, (the risk) might go up by a factor of 100. But it still is less than 1 percent,” he said.

“So there are periods of increased hazard and increased risk that we can identify. But the increase in the risk of hazard, even though it's got a large factor of increase in hazard, it's still small in an absolute sense. But that information still needs to be available to the public.”

The Southern California Earthquake Center is collaborating with U.S. Geological Survey on developing an earthquake early warning system for California, Jordan said.

“These systems are operational in Japan, and the Japanese love them; they really rely on them,” he said.

“There are things you can do in a short amount of time to protect yourselves individually. But imagine you're under the knife at a hospital. Surgeons would like to have a minute warning that they are about to be shaken.”

Arrowsmith said the Japanese system is integrated to do things like automatically shutting down the nation's high-speed bullet trains.

Such a system for California is projected to cost up to \$100 million.

“It's a big investment,” Arrowsmith said. “The problem is, though, it works well if you're far away from the earthquake, and you have time. If the earthquake happens underneath you, you still have no early warning.”

With no solid short-term prediction capabilities expected, the most important thing residents of earthquake country can do is be prepared for when the shaking starts — whenever that may be, said Dennis Mileti, a Rancho Mirage resident and former California Seismic Safety commissioner.

“While the scientists can't say exactly when an earthquake will occur, what they can say with 100-percent certainty is that the earthquake we face will happen,” he said. “At least the cities in this valley will be here when it does. And the odds are very high that if you're of average age, you'll be here, too.”