

## Scientists seek clues in Mexicali earthquake

*Research flights are launched over Southern California to try to determine how, or whether, the 7.2 Easter earthquake affected other fault lines.*

**Hector Becerra, Los Angeles Times, 7-2-10**

Three months after a magnitude 7.2 earthquake erupted on the U.S.- Mexico border, seismologists are on a quest to determine whether the massive rupture put more pressure on fault lines in Southern California, increasing the likelihood of more temblors.

The Easter Sunday quake was the largest to rock the region in nearly two decades, producing thousands of aftershocks and actually shifting the Earth's crust as much as 10 feet.

Preliminary analysis shows that the Mexicali quake placed more pressure on at least two Southern California fault lines: the Elsinore and the San Jacinto. Both those faults run through the Inland Empire and are relatively close to the border fault that produced the big quake.

Scientists say earthquakes now are more likely on those two faults, but because so little is known about them, it's hard to calculate the risks.

Experts say the larger question is whether the temblor made quakes more likely along more dangerous fault lines, such as the Whittier — which produced the deadly 1987 Whittier Narrows quake — and the San Andreas.

Scientists are particularly interested in the Whittier fault because it's connected to the Elsinore and runs under heavily populated areas.

On Thursday, NASA flew a specially equipped Gulfstream III jet over the quake zone, looking for signs of Earth rupture that could help experts understand how the various faults are connected.

There are several key clues scientists were looking for during the nearly six-hour research flight, which covered such seismically active areas as the Salton Sea and U.S.-Mexico border as well as the San Diego coast. If data show slipping along the northern edges of the Mexican fault that triggered the 7.2 quake, that would suggest that pressure is being placed on faults in Southern California.

If they don't see significant slippage, it could suggest that the fault has stabilized and there is less risk to faults in California. The flight, one of several planned, produced photos and data that scientists will analyze.

"If the 7.2 quake in Mexico continued along the Elsinore fault, it could have continued into the Whittier fault," said Eric Fielding, a geophysicist at the Jet Propulsion Lab in La Cañada Flintridge. "It didn't. But we want to understand how faults in Mexico are linked to faults like the Elsinore."

Scientists admit there is still much they don't know about how different faults are connected and how a quake on one fault changes the chances of a quake on a nearby fault.

They believe a large earthquake on one fault can trigger quakes on neighboring faults.

Greg Lyzenga, a JPL geophysicist, likened it to a sagging mattress.

"If one person rolls over one part of the mattress, it's going to have an effect, subtle or direct, on someone sleeping a few inches away, depending on how stiff or sagging the mattress is," Lyzenga said. "When a quake happens in one location, it moves the material in such a way that it sends stress to the immediate surroundings."

But exactly how that works is still open to speculation. Quakes erupt on specific segments of fault lines, Fielding said. So a major quake on, say, the northern edge of one fault could cause a nearby fault to rupture but might not necessarily cause major breaks on the original fault's southern end.

The Baja earthquake collapsed buildings, resulted in two deaths and caused more than \$90 million in damage in California alone. It was the largest quake in the Southern California-Baja California quake region since the 1992 Landers quake in the Mojave desert.

Seismic technology has improved significantly since then, so the researchers hope to learn much from the April 4 temblor.

For now, the focus is on the relatively obscure faults. The Elsinore fault runs through portions of San Diego County, including near Julian, as well as through Temecula and Lake Elsinore in Riverside County; the San Jacinto fault runs near cities such as Hemet, Loma Linda and San Bernardino.

The Elsinore fault is capable of large earthquakes, though none has been documented by researchers, said Andrea Donnellan, another JPL geophysicist.

Neither the 7.2 temblor nor the many aftershocks have caused the Elsinore fault to rupture. But their proximity to the Mexican fault has officials concerned enough to launch the flights and perform additional research.

"If a fault exists, it can produce a quake," Donnellan said. "It may be very infrequent, but the Elsinore fault is in a tectonically active area."

Information gathered on Thursday's flight will supplement satellite images that experts have already reviewed showing how the Mexicali quake changed the landscape. In addition to assessing quake risk in Southern California, officials also hope they can better understand how faults interact.

"This is a very young field, just a few decades old, really," Lyzenga said. "We're kind of flying blind a little bit as we try to find out exactly how these things play out."