

Lasers, earthquakes and flood protection

New UC Davis technology could help predict the big one. And save Sacramento's levees.

Seth Sandronsky, Sacramento News & Review, 3-15-12

Everyone loves 3-D. And lasers. But can a UC Davis academic, along with a team of scientists, use these two celebrated pop-culture technologies to predict when the next big earthquake will occur?

Michael Oskin, professor of geology at UCD, isn't about to proclaim as much just yet. But his work with Chinese and Mexican scientists is revealing more information about the size of past earthquakes—and how future ones could occur on major faults in California.

Recently, the team co-authored a piece in the journal *Science* about their use of light detection and ranging to create pre- and post-earthquake images. LIDAR is a laser scanner flown in an aircraft that surveys landscapes and creates three-dimensional images of fault lines.

“This technology has come quite a long way in the past couple of decades,” Oskin said. He explained that LIDAR captured an aerial view of the 2010, 7.2-magnitude Mexicali earthquake rupture zone, 140 square miles, with great precision and at a very high resolution, in two-and-a-half days. The National Science Foundation provided funding for this project.

Oskin said that, before the earthquake, the Mexican government also had scanned the region's topography in 2006 with LIDAR. Now, using both scans, scientists can better understand the geologic process before and after the Mexicali disaster, how such movements happen over time.

To this end, scientists will use LIDAR to assess the size of previous earthquakes and learn more about how future ones might occur on major faults in California now, Oskin said.

“But we can't predict earthquakes in time,” Oskin conceded.

Closer to Sacramento, the Delta region is a water supply central to the needs of Californians, from farmers to urban dwellers. But the Delta also has scattered, small faults under some of its hills. Similar smaller faults triggered Mexicali's 7.2 earthquake.

The probability of a huge earthquake, however, is relatively low in the Sacramento region, Oskin said. He bases that assessment on the movement rates and relative sizes of fault structures in the region.

But the risk is quite high that any earthquake might destroy Sacramento's levee system, which protects millions of people and billions of dollars of property.

“That economic impact may motivate mitigation for events that are uncommon,” Oskin said. “That's a difficult decision to be made.”

Indeed, Mother Nature's power when dams and levees handle major rivers in your backyard is worthy of respect. She plays for keeps.