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No one can find faults in Orange County like Lisa Grant.

A UCI assistant professor with the [School of Social Ecology](#), Grant found one big fault—as in earthquake—essentially as she lay on a sun-baked beach and gazed at the surrounding San Joaquin Hills that run from Newport Beach to Dana Point.

And now she is gazing out across Orange County to bigger things.

But let's back up a decade or so to when Grant was studying earthquakes at the California Institute of Technology as a graduate student and sunbathing on the beach near the San Joaquin Hills.

"It looked to me that there was an uplift in the San Joaquin Hills, just like in many other areas in the Los Angeles basin. The basin is surrounded by hills, and the reason there are hills is that they are being pushed up by faults.

"Lots of scientists have studied other hills. But the San Joaquin Hills were an anomaly because almost no one had looked at them to see if they were actively forming. Why should they be any different? If you have a large area being squeezed, then why isn't this part being squeezed?"

"The more I looked for information, the more surprised I was by the lack of research. So I started studying it on my own."

Her personal research might have taken decades had not the Northridge earthquake rattled up from an undiscovered blind-thrust fault running underground. This sparked more interest in finding other blind faults and enabled Grant to find funding for her research.

The result: Grant reported evidence that the San Joaquin Hills rose from the sea because of an undiscovered blind fault capable of a 6.8 to 7.1 magnitude jolt.

So far, Grant has not found the fault's exact location. "We haven't had that earthquake to tell us exactly where it is."

Grant's best guess is that it runs northwest to southeast following the coastline. Its approximate inland border is near the 405 Freeway at the Santa Ana River to the El Toro Y and then along the 5 Freeway to Dana Point. The area includes such prime real estate as Newport Beach, Laguna Beach, San Juan Capistrano, Aliso Viejo, Laguna Hills and Irvine, including the UCI campus.

Since discovering the fault in 1999, Grant and her team of researchers have tried to determine how active it has been.

Grant is gazing out on Orange County again and wondering.

"We're looking across the valley at the Santa Ana Mountains. Why are they mountains? No good explanation has been published. So we'd like to know. In California, where you have mountains, there is usually—but not always—a fault.

"From our first analysis of the Santa Anas, it looks like some similar fault-related movement. This is early in the study and it is much too early to stand by my results. But it kind of makes sense based on the geology of this part of Southern California. They are mountains and actually pretty high. They are as high, or higher than, the Santa Monica Mountains, the Verdugo Mountains, Puente Hills, Coyote Hills, and all these hills have active faults under them.



California Institute of Technology as graduate student

Personal research in the Northridge earthquake resulted in funding for her investigations

Research finding: San Joaquin Hills rose because of an undiscovered blind fault

[Faculty profile](#)

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["Spanish explorers recorded first and possibly largest earthquake in Los Angeles history"](#)

News release:

["Coastal Orange County fault could produce quake as large as 7.3"](#)

“So far no one has asked whether there is a fault under the Santa Anas.”

Grant and her team plan to answer that question within the next four years.

“These faults are like natural terrorists hiding under our homes, office and schools,” Grant says. “They’ve been waiting quietly until the next earthquake. And we can reduce the impacts if we know what the plan is and prepare for it.”

— *Alan Janson*

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