



# DEPARTMENT OF CONSERVATION

*Managing California's Working Lands*

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**PHOTOS AVAILABLE UPON REQUEST**

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## California Geological Survey Completes Trench Study of Tahoe Area Earthquake Fault

**EDITORS: Raw video available here: <ftp://206.170.189.144/pub/pao/>**

SOUTH LAKE TAHOE – The California Geological Survey (CGS) recently completed a trench study across the West Tahoe Fault in an effort to learn how often large earthquakes occur in the Lake Tahoe Basin. As a result, geologists now conclude that two earthquakes in the magnitude 7 range occurred in the area since the last ice age about 12,000 years ago, shifting the landscape at least 12 feet vertically.

“The sediment is like a tape recorder that records events in time,” said CGS Engineering Geologist Gordon Seitz. “We look for how the layers of sediment match up across faults. Anything organic, like old plant matter or burned wood can be radiocarbon dated to determine how old it is, which tells us about how long ago an event like an earthquake took place.”

Ultimately, CGS may use information from the trenching project and previous research along the fault from the bottom of Lake Tahoe to create seismic hazard maps for ground rupture, liquefaction, tsunami inundation, and landslides.

Seitz plans to do the radiocarbon dating work at the Lawrence Livermore Laboratory in the next couple of months. The trench, dug on U.S. Forest Service land near the town of Meyers, provided ample evidence of earthquakes on the West Tahoe Fault that would have done significant damage in a populated area.

“It’s not the points of magnitude that really matter,” said Seitz. “These quakes were all big. It’s more important to know how often they happen so we can prepare the public.”

How did Seitz know where to dig? He used a variety of LIDAR (Light Detection and Ranging) images and old-fashioned foot work. LIDAR uses sensors on the bottom of an airplane to map the elevations of a landscape -

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in the highest resolution possible. Once that data revealed a likely spot, Seitz put boots on the ground. It turned out that what looked like a man-made dirt road for vehicles off Highway 50 west of Meyers was actually the result of fault shifting.

A 16-foot-deep, 100-foot-long long trench was dug across the fault, which runs for about 30 miles. Using the tools of archaeologists, brushes and scrapers, CGS geologists were able to uncover a distinct line where the landscape had shifted 12 to 13 feet.

In July, scientists and engineers from CGS and other institutions tested a remotely operated vehicle (ROV) in Lake Tahoe prior to its being deployed for scientific research in Antarctica. Previously, as part of the testing, an ROV captured images of the West Tahoe Fault running underneath the lake. The mechanics of the fault are such that the west side moves up relative to the east side, creating a tsunami wave when the lake floor is displaced.

“Anyone who has lived in California for any length of time probably is aware of how dangerous earthquakes, landslides and tsunamis can be,” said State Geologist Dr. John Parrish, head of CGS. “A large shift of the West Tahoe Fault could cause a tsunami in the Tahoe basin. If we end up creating Alquist-Priolo Zone maps as a result of these findings, they will be an additional tool in the tool box of local officials to protect public safety and property.”

This study was federally funded through the United States Geological Survey National Earthquake Hazards Reduction Program.

CGS is part of the California Department of Conservation (DOC). In addition to studying and mapping geologic phenomena such as earthquakes and landslides, DOC categorizes mineral resources; administers agricultural and open-space land conservation programs; ensures the reclamation of land used for mining; and regulates oil, gas and geothermal wells. For more information, visit <http://www.conservation.ca.gov/Index/Pages/Index.aspx>.

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