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NEW QUAKE SCENARIOS FOR MAMMOTH MOUNTAIN AREA

CGS, USGS Report Intended to Help in Emergency Planning

SACRAMENTO -- Shaking causes most of the destruction in an earthquake. But the Long Valley Caldera-Mono Lake area, which has five faults capable of producing a temblor of magnitude 6.7 or greater, faces additional sources of damage in the next large quake, according to a new report from the California Geological Survey (CGS) and the U.S. Geological Survey.

"Shaking is the obvious concern, but there are lesser-known effects that pose threats to public safety and property," said CGS Supervising Geologist Chris Wills, one of the co-authors. "This report identifies areas prone to surface fault rupture – that is, the ground on one side of a fault moving horizontally or vertically relative to the other side – landslides, and also liquefaction, which means the ground temporarily losing its ability to support buildings or infrastructure."

The report, "Scenario Earthquake Hazards for the Long Valley Caldera-Mono Lake Area, East-Central California," is available online at: http://www.conservation.ca.gov/cgs/rghm/loss/Documents/CGS_SR233_ofr2014_1045.pdf. It is part of the U.S. Geological Survey's (USGS) multi-hazards project for this volcanic and heavily faulted part of California.

"The analyses in the new report can be useful in estimating the extent of potential damage and economic losses in possible future earthquakes and in preparing emergency response plans," co-author Dave Hill of the USGS said. "This area is very seismically active. There was a swarm of small earthquakes in February around Mammoth Mountain, but large and damaging quakes must be expected."

CGS developed earthquake scenarios for the five faults in the study area considered most likely to produce a Northridge-sized or larger earthquake -- Fish Slough, Hartley Springs, Hilton Creek, Mono Lake, and Round Valley Faults – as well as the White Mountains Fault to the east. The scenarios portrayed are not worst-case events.

"The scenarios are both large enough and likely enough that emergency planners should consider them in

regional emergency response plans," Wills said.

Each scenario is illustrated with maps of seismic shaking potential and fault displacement, liquefaction, and landslide potential. All scenarios show the possibility of widespread ground failure.

Liquefaction damage would likely occur in the areas of higher ground shaking near the faults where there are sandy/silty sediments and the depth to groundwater is 20 feet or less. Generally, this means damage is most common near lakes and streams in the areas of strongest shaking.

Landslide potential exists throughout the study region, particularly where there are steep slopes. The landslide hazard zones also are likely sources for snow avalanches during winter months and for large boulders that can be shaken loose and roll hundreds of feet downhill, which happened during the 1980 Mammoth Lakes Earthquakes, a magnitude 6.2 and two magnitude 5.9s.

Fault rupture did significant damage to the Mammoth Elementary School, and nine people were injured during the 1980 sequence.

CGS is part of the California Department of Conservation (DOC). In addition to studying and mapping geologic phenomena such as earthquakes and landsides, 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 www.conservation.ca.gov.

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