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Coastal living getting more hazardous

By JOHN LEIGHTY
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DESPITE efforts to armor the land against nature's fury, the risks of building on California's picturesque coastline have been dramatically magnified in the aftermath of last fall's earthquake in the Santa Cruz mountains.

Preliminary evidence indicates uplifting of the mountain range by the 7.1 magnitude jolt may have actually raised the shoreline slightly from Santa Cruz to Monterey, a phenomenon that could result in less damage to structures by large winter waves.

The quake, however, also

cracked bluffs and weakened cliffs along a wide stretch of coastline, making living conditions dangerous around some popular beach areas already prone to natural erosion and battering surf.

Gary Griggs, a geologist studying coastal protection methods for the U.S. Army Corps of Engineers, used a helicopter to survey the coast from Stinson Beach to Big Sur in the weeks after the Oct. 17 quake and was surprised at the extent of weakened land.

"We saw failure of sea cliffs from Pacifica, 50 miles from the quake's epicenter, to Monterey along the bluffs," said Griggs. "There was wide-

spread failure of bluffs that were developed — and where they hadn't been developed."

Griggs, an earth sciences professor at UC-Santa Cruz, said the earthquake triggered slides as far north as Bolinas in Marin County along cliffs made of soft rock, such as sandstone and shale.

"During the earthquake, a big chunk of the Santa Cruz Mountains went up and the shoreline may have come up 15 or 20 centimeters, which would eliminate some 50 years of sea level rise," said Griggs, noting that two major plates of the earth's crust slide along each other where the land meets the Pacific Ocean.

In the long term, Griggs said, the West Coast may be in for a geological uplift — keeping rising sea levels at bay.

Dave Keefer, an erosion expert with the U.S. Geological Survey, said fault movement during the quake lifted up a whole block of the Santa Cruz Mountains 4 to 5 feet along their western flanks, resulting in a tiny raising of the coast.

"The coast has been uplifted by quakes of the past. This was just one more little bump in the process," said Keefer, who said slides and cracking along the shoreline were predictable based on evidence from past tremors, including the great

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San Francisco earthquake of 1906.

Hundred miles of coast

collapsed or slid in 1906, he said, but people later moved back in droves for the ocean views and lure of seaside living.

Since the October quake, three homes built on the edges

treated White since he contracted AIDS are helping

of Monterey-area bluffs were razed because of cracking and crumbling, and other structures at the bottom of bluffs were damaged by sliding rocks and dirt, Griggs said. An apartment complex in Capitola,

he said, had to remove six units overhanging a cliff.

"There's been a major impact on the bluffs. There's a lot of bare areas and lots of plastic draped over the bluffs to slow erosion," Griggs said.