

The La Conchita Landslides

Geological setting:

In the past, the entire La Conchita area was partially or fully submerged. This resulted in a landscape that consists of weakly cemented marine sediment, sandstone, siltstone, and siliceous shale. Many of these materials are layered. The area where the community of La Conchita is situated was formed from ancient mudslides. The entire hillside is littered with landslides, mudslides, and deep ravines. Due to the presence of nearby faults, the hillside is slowly being pushed up, resulting in cracked bedrock and very weak soil. Mass wasting events have been consistently occurring for thousands of years and up to the present day.

History:

There are documented accounts of mass wasting dating back to the early 1800's. Despite the storied past, this area was settled in 1924 with roughly 200 lots. Why this area was allowed to be settled given the well-known danger is not specified. Geological reports since the 1940's have cited the extreme mass wasting risk of the area. Several hundred residents of the small community still reside in the area due to its prime coastline location and family friendly environment.

1995:

Initial movement at the site of the slide was detected as early as the summer of 1994, when several surface cracks appeared on the slope. Small deformations continued to appear throughout the rainy season. By December of 1994, several large surface cracks were channeling surface runoff into the subsurface. This channeling effect caused by the surface cracks are largely credited for the mass failure of the slope.

At 2:03 p.m. on March 4th, 1995 the slope above La Conchita failed. The debris flowed tens of meters in less than ten minutes. This flow destroyed or severely damaged nine houses. The mass that moved was part of an ancient landslide that makes up the entire bluff above the town. The slide was 400 feet wide, 1100 feet long, and covered approximately 10 acres. The depth of the failure plane was estimated at greater than 100 feet, and the volume was estimated at 1.7 million yd³.

2005:

The landslide fully mobilized at 12:30 p.m. on January 10, after a 15-day period of record rainfall. Intense rainfall lead to sudden slope failure. Roughly 15% of the 1995 landslide remobilized and a shallow layer of dry soil advanced down the mountain at initial speeds of 30 ft/s. This was filmed by people on route to investigate a separate mud flow incident in the area. Unlike the 1995 landslide, this landslide was fast and 10 fatalities were incurred. Several legal disputes occurred after the landslide, including a litigation against the farmers on the top of the slope. The county has still not cleaned up the debris from the landslide, citing financial and safety concerns.

Conclusion:

Additional landslides are almost guaranteed though the exact mechanism is still unknown as there are a plethora of landslide locations that are suspect. A future mass wasting event is certain.

References:

- <https://pubs.usgs.gov/of/2005/1067/images/Fig3a.jpg>
- <https://pubs.usgs.gov/of/2005/1067/images/Fig1.jpg>
- <http://www.ia.ucsb.edu/pa/image.aspx?pkey=1356&Position=1>
- <https://www.youtube.com/watch?v=W4KWxglDL3o>
- https://c1.staticflickr.com/1/3/4833281_11c217048c.jpg
- <http://www.freerepublic.com/focus/f-news/1319770/posts>
- <https://pubs.usgs.gov/fs/2005/3107/pdf/FS-3107.pdf>
- http://www.centralia.edu/academics/earthscience/nathaz/lectures/8_masswasting.pdf
- <http://www.ia.ucsb.edu/pa/image.aspx?pkey=1356&Position=1>