

DEBRIS FLOW FACTS & SAFETY IN VENTURA

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Thomas L Davis is a local geologist with experience in mapping debris flows and other geologic hazards (see above links).

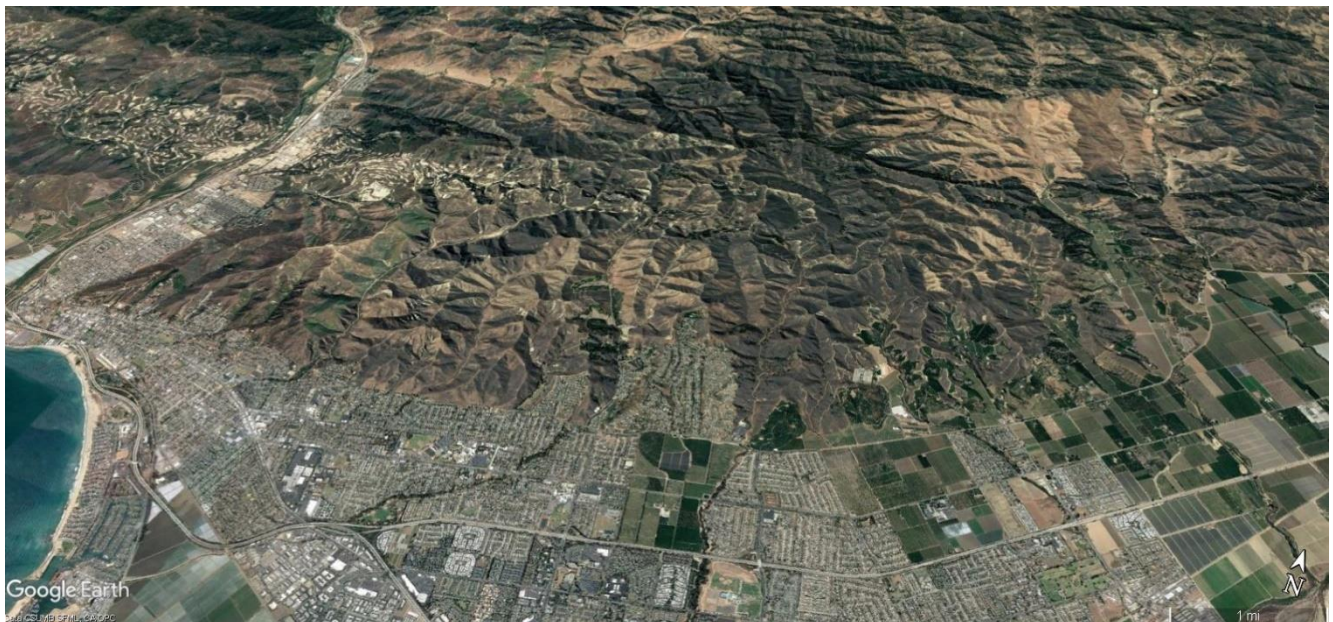


What are debris flows? Debris flows (mudslides) are rapidly flowing landslides of rock and mud that initiate in steep-walled canyons (more or less those difficult to hike up the walls) and commonly flow through the canyon openings and onto the gentler, open slopes below. Flows have the consistency of wet cement, yet typically move downslope at about 10 mph and can exceed 35 mph ⁽²⁾, are a common geologic process, and can be very dangerous and destructive. In the United States, landslides and debris flows result in 25 to 50 deaths each year ⁽³⁾. The risk of debris flows increase significantly following brush and forest fires ⁽⁴⁾. This elevated risk usually lasts for 2-3 years following a fire ⁽⁵⁾.

Will debris flows occur in Ventura? No one knows, but the likelihood is greater due to the Thomas Fire stripping vegetation from the slopes above the city, and increasing the soil's water repellent properties (hydrophobicity) which adds to surface runoff ⁽¹⁾. The city's location and elongate shape along the base of a moderate to steep slope, cut by steep-walled canyons (barrancas) that drain extensive areas uphill of the city, and the unconsolidated and easily erodible "bedrock" underlying the slopes adds to debris flow susceptibility.

When? Flows are triggered by periods of intense rainfall and their occurrence increases when: 1) the ground is already water saturated from previous rainfall(s), 2) vegetation and ground have been burnt during the last several years, 3) the first set of significant rain storms arrive following a fire. Debris flows can occur with little or no warning and commonly happen at night; many fatalities have occurred when people are sleeping ⁽¹⁾.

Where? Debris flows frequent canyon bottoms, stream channels, at canyon mouths (openings), along man-modified slopes such as road cuts, and at and near drainage culverts. Is your residence in such a location as flows will follow the same pathways? It is important to understand the drainage pattern at and above your residence: are you in a low spot, do drainages converge upslope from you, is there evidence of prior earth movements such as tilted walls and trees?



GOOGLE EARTH IMAGE OF HILLS ABOVE THE CITY OF VENTURA SHOWING THE SERIES OF STEEP-WALLED CANYONS (BARRANCAS) WHICH DRAIN TOWARDS THE CITY.

Safety tips:

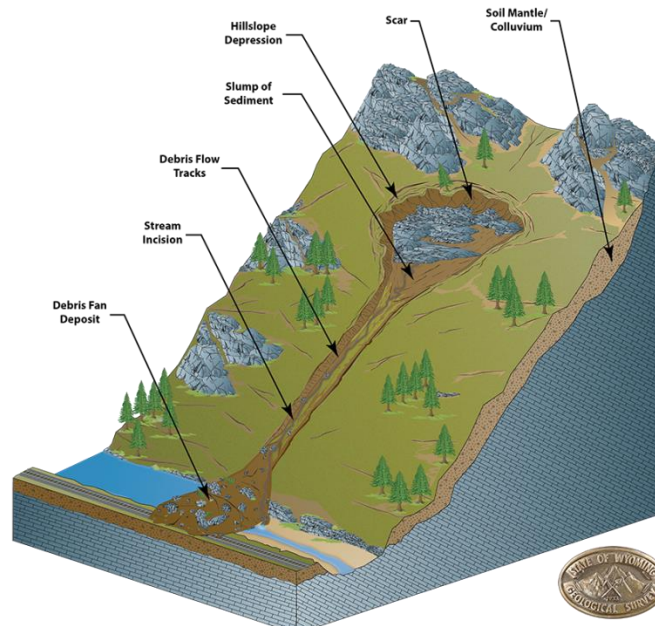
- ✓ Know the City and County emergency services and evacuation plans. Build a personal evacuation plan.
- ✓ Stay informed via the National Weather Service about approaching storms and expected rain fall rates and amounts ⁽⁵⁾. In California, post-fire debris flows started from as little as 0.5 inch of rain in 40 minutes ⁽⁵⁾.
- ✓ Avoid canyons and stream channels during and following rain storms. Stay on high ground.
- ✓ Remain awake during heavy rain if you are in an area of debris flow potential. Watch for sudden increases and decreases in surface runoff and changes in the muddiness of the water. Listen for unusual sounds from breaking tree limbs and boulders tumbling. Be ready to go quickly to higher ground. Don't wait!
- ✓ Avoid driving during periods of intense rainfall. If you reside in an area of high debris flow potential then consider leaving prior to the arrival of storm events and return home after the storm.

Insurance: There are many types of insurance that a property owner can obtain to address property loss due to fire, flood, and earthquake. Please consult with an insurance provider as to the different types of insurance and what they cover and exclude and the timeframe on when the policy becomes effective from the purchase date ⁽⁷⁾⁽⁸⁾. Read all policies closely and ask questions⁽⁹⁾!

Additional resources on debris flows and references:

1. United States Geological Survey (USGS); California Water Science Center, Wildfires, Water, and CWSC Science; <https://ca.water.usgs.gov/highlights/2017/10/wildfires-water-quality>
2. United States Geological Survey (USGS), Fact Sheet 176-97, <https://pubs.usgs.gov/fs/fs-176-97/fs-176-97.pdf>
3. Center for Disease Control and Prevention (CDC), Natural Disasters and Severe Weather>Landslides and Mudslides, <https://www.cdc.gov/disasters/landslides.html>
4. United States Geological Survey (USGS), Southern California Wildfires and Debris Flows, <https://pubs.usgs.gov/fs/2005/3106/pdf/FS-3106.pdf>
5. S.H. Cannon, et al., 2010 <https://pubs.usgs.gov/of/2010/1039/pdf/OF10-1039.pdf>
6. National Weather Service Forecast Office, Los Angeles/Oxnard: http://www.wrh.noaa.gov/total_forecast/getprod.php?wfo=lox&afos=AFDFGZ
7. FEMA, National Flood Insurance Program Summary of Coverage FEMA F-679 / November 2012 https://www.fema.gov/media-library-data/20130726-1620-20490-4648/f_679_summaryofcoverage_11_2012.pdf
8. FEMA, National Flood Insurance Program Dwelling Form Standard Flood Insurance Policy F-122 / October 2015, https://www.fema.gov/media-library-data/1449522308118-6752c210f65aed326a9ddf4a0ddaca1f/F-122_Dwelling_SFIP_102015.pdf
9. Homeowners Insurance Does Not Cover Many Types of Damage, <http://geology.com/articles/homeowners-insurance.shtml>

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SKETCH SHOWING THE BASIC FEATURES OF A DEBRIS FLOW (MUD FLOW). COURTESY OF THE WYOMING GEOLOGIC SURVEY.