

Preliminary Data Findings: Understanding Debris Flow Hazards in Altadena and Palisades Hills

Date Released: 3/31/2025

Key Takeaways: _____

- The last decade of California's cycle of climate extremes including wildfires and extreme precipitation had led to increased risk of mudslides, especially in areas that were affected by the wildfires.
- City officials should use these maps to deploy resources to prevent mudslides and flooding in the event of extreme rains.

What's in this report? _____

Mapping and modeling are important tools to help researchers determine what type of chemicals that water run-off contained, and where the debris was likely to have settled. Using satellite observations and high-resolution topographic maps, we can identify slopes that are more prone to mudflows and landslides.

This work does not have immediate action items or cause for concern for the public, but instead helps city officials, planners, and others understand that many types of impacts from urban wildfires, and start to think about ways to mitigate risks in the future. Run-off mapping can also help to predict risk of mudslides and debris flow events triggered by extreme rains, and help to improve evacuation planning.

What's next? _____

This work helps to focus our team's future research efforts on geographic areas that were likely to have been exposed to the smoke plume, mudflow and run-off debris, and identify what chemicals were likely present in those exposures.

We will, over time, extend this analysis to all of Los Angeles wildland-urban-interface areas (areas where wild forested land meets urban areas) and suggest methods for reducing fuel loads that might lead to the release of contaminants in future fires.

LA Fire HEALTH Study Consortium

DATA SET 1: DEBRIS FLOW HAZARDS

Preliminary Data Findings: Rain and Debris Flow Mapping

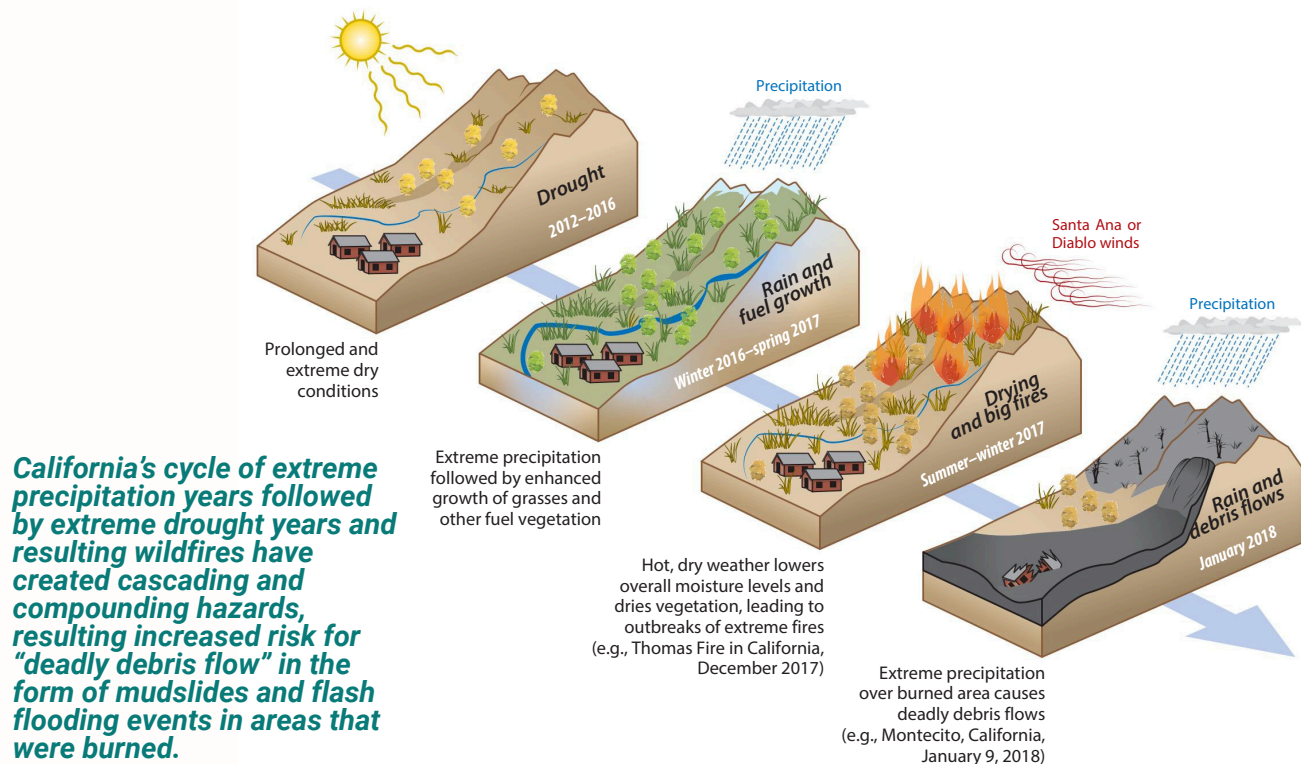
Data Type: Mapping / Modeling

Location: Los Angeles

Key Takeaways:

- California's cycle of extreme precipitation years followed by extreme drought years and resulting wildfires have created cascading and compounding hazards, resulting increased risk for "deadly debris flow" in the form of mudslides and flash flooding events in areas that were burned (Figure 1, below).
- City officials can use slope classification risk maps (see next page) to evaluate the likelihood of extreme rain over burned areas. These maps can be used for risk assessments and to deploy resources (sand bags, flood barriers) and plan evacuation routes to prevent future disasters.
- Understanding risk is also important for zoning and urban planning officials, especially as rebuilding efforts begin in LA.

FIGURE 1: COMPOUNDING AND CASCADING HAZARDS

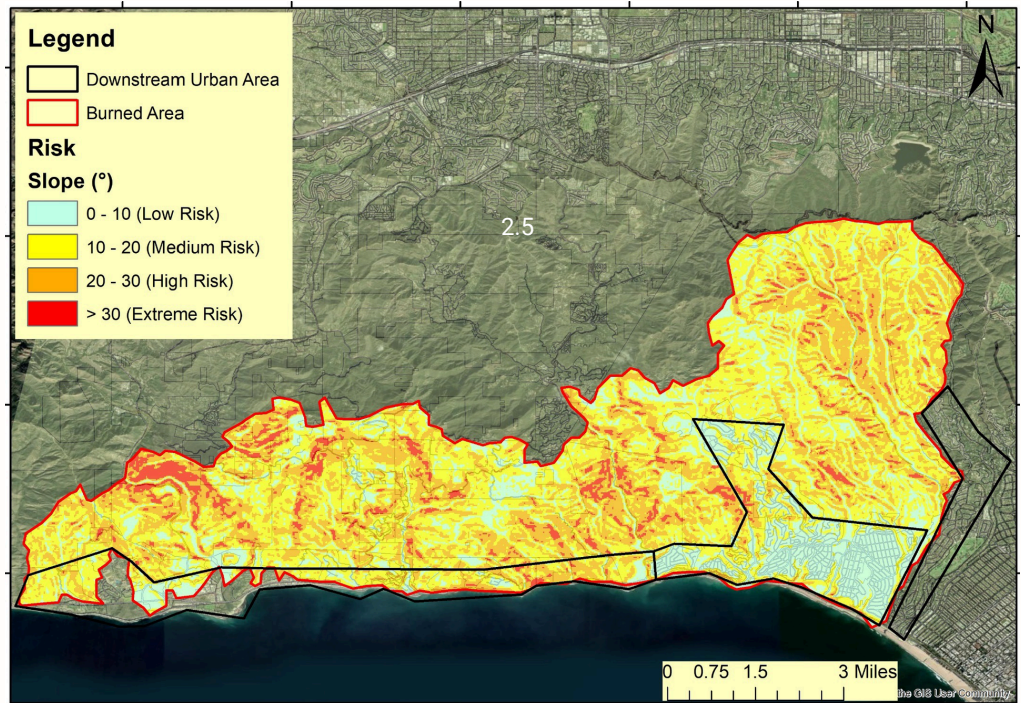


DATA SET 1: DEBRIS FLOW HAZARDS

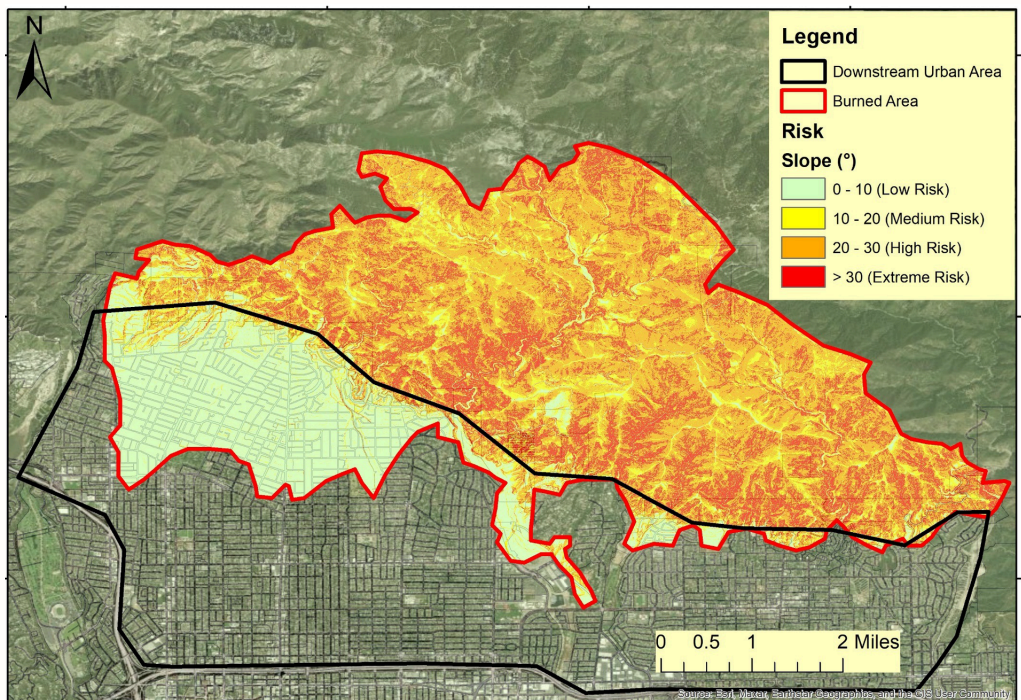
(continued)

The following are slope classification risk maps, which can be used to evaluate the likelihood of debris flow caused by extreme rain over burned areas. These maps can be used for risk assessments and to deploy resources (sand bags, flood barriers) and plan evacuation routes to prevent future disasters.

PALISADES



ALTADENA



Notes Burn scars were identified using the Normalized Difference Backscattering Index (NDBI), estimated from VV and VH channels of Sentinel-1 C-band Synthetic Aperture Radar (SAR) for the following periods: Pre-fire: November 1–30, 2024; Post-fire: January 7–17, 2025. Topographic data were obtained from the 1-meter Los Angeles Region Imagery Acquisition Consortium (LARIAC) LiDAR dataset, available via NOAA: <https://coast.noaa.gov/dataviewer/#/lidar/search/>



IF YOU HAVE QUESTIONS:

- Email us: info@lafirehealth.org
- Visit the website: www.LAFireHEALTH.org

The Los Angeles Fire Human Exposure and Long-Term Health Study is a 10-year study of the Los Angeles fires to evaluate which pollutants are present, at what levels, and where, and to assess the respiratory, neurological, cardiovascular, reproductive, and immune system impacts of the wildfires.

The data shared in this brief are preliminary in nature and are being made available to the public in an effort to provide data as soon as possible. Research is a process and results can change over time based on new data input. The data shared on this site is for informational use only and should not replace the advice of a medical professional. This is a study run by a consortium and as such, no one university or institution is responsible or liable for the data or recommendations presented.