



DEPARTMENT OF CONSERVATION FACT SHEET

PUBLIC AFFAIRS OFFICE (916) 323-1886

California Geological Survey Post-Fire Landslide Response

The California Geological Survey (CGS) provides geologic analysis, input and advice regarding post-fire debris flows and related hazards when requested by the Governor's Office of Emergency Services (CalOES) and the California Department of Forestry and Fire Protection (CalFIRE). Over the past 15 years CGS has provided geologic input on post-fire debris flow hazards following more than 20 fires in California.

Debris flows, sometimes referred to as mudflows, are fast-moving landslides that can travel at speeds over 35 miles per hour. They can travel significant distances from their initiation point and can be highly destructive, potentially resulting in loss of infrastructure, property, and lives. Debris flows typically occur during periods of intense rainfall or rapid snowmelt. It has been well documented that a significant effect of wildfires is the resultant increase in rainfall runoff, as well as the increase in both the probability and volume of debris flows issuing from mountainous basins.

Research from recently burned areas in California, Colorado and Utah shows that most post-fire debris flows are initiated by hillslope runoff and resultant erosion and scour in channels by moving debris. Most commonly, post-fire debris flows occur within two to five years after a fire and can be triggered during storm events with return periods of two years or less. Effective mitigation of debris flow hazards necessitates a rapid assessment of potential areas at risk due to the brief time (often only weeks) between fire suppression and the onset of fall and winter storm events.

In assessing post-fire debris flow hazards CGS geologists with expertise in slope stability and landslide hazards typically work hand-in-hand with other technical specialists such as hydrologists and engineers as they assess post-fire effects on flooding, hydrology, engineering structures, etc. CGS geologists use a number of tools to assess the potential for post-fire debris flows including; geologic, soils, climatologic and topographic information; aerial imagery and satellite derived burn severity data; as well as the results of computer generated hydrologic and debris flow models developed by agencies such as the US Geological Survey. This information is coupled with aerial reconnaissance and on-the-ground observations of site specific conditions to develop an understanding of vulnerable areas and potential values at risk.

Based upon this information, CGS geologists develop summary reports of areas with higher potential for debris flows and locations where property and lives may be at risk. This information is then transferred via CalOES to the relevant emergency response and mitigation agencies so that emergency response plans and mitigation measures can be designed and implemented in a timely manner.

###