Weather-Ready Nation
National Oceanic and Atmospheric Administration

National Weather Service

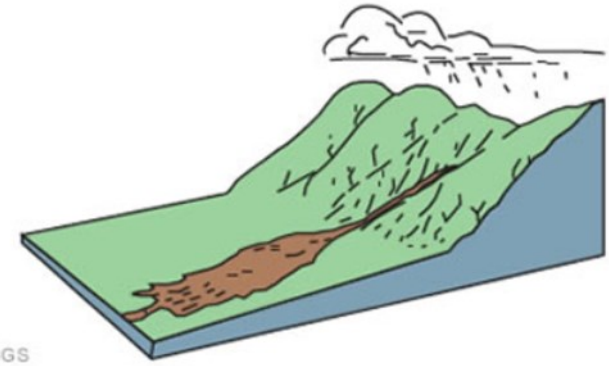
Debris Flow Fact Sheet

What is a Debris Flow?

Debris Flow Definition

A debris flow is a moving mass of loose mud, sand, soil, rock, water and air that travels down a slope under the influence of gravity. To be considered a debris flow, the moving material must be loose and capable of "flow," and at least 50% of the material must be sand-sized particles or larger. Debris flows often occur in an area recently burned by wildfire.

Some debris flows are very fast—these are the ones that attract attention. In areas of very steep slopes they can reach speeds of over 100 miles per hour, though most travel between 10 and 30 miles per hour.



USGS debris flow illustration: Debris-flow source areas are often associated with steep gullies, and debris-flow deposits are usually indicated by the presence of debris fans at the mouths of gullies. Image and caption by the United States Geological Survey.

How do debris flows happen in California?

Photo Courtesy of KCLU

A

Photo Courtesy of National Weather Service

B

Photo Courtesy of USGS

C

Photo Courtesy of Mike Eliason

D

California is susceptible to large wildfires (A) that can occur during warm, dry, windy conditions. Following wildfires, the soil and denuded hillsides (B), for a period of several years, can become water repellant (C). When it rains, if heavy enough, can result in flash flooding and debris flows in areas recently burned by wildfire (D). Debris flows generally are a result of high-intensity short-duration rainfall falling on the steeper slopes of a recently burned area and can occur at any time of the year. In fact, flash flooding and debris flows can occur outside of burned areas as well as a result of heavy rainfall.

Preparing for post wildfire debris flow risks

Residents and businesses need to prepare in advance for flood conditions. Before the threat of flooding becomes imminent, residents and business owners should:

- Purchase a flood insurance policy
- Review your current insurance policy and become familiar with what is covered and ensure the limits adequately protect their building and personal belongings.
- Make an emergency kit, plan evacuation routes, and keep important papers in a safe, waterproof place.
- Itemize and take pictures of possessions.

For more information regarding a policy, please call your insurance agent. You can also visit **FloodSmart.gov** or call 1-800-427-2419 to find a local agent.

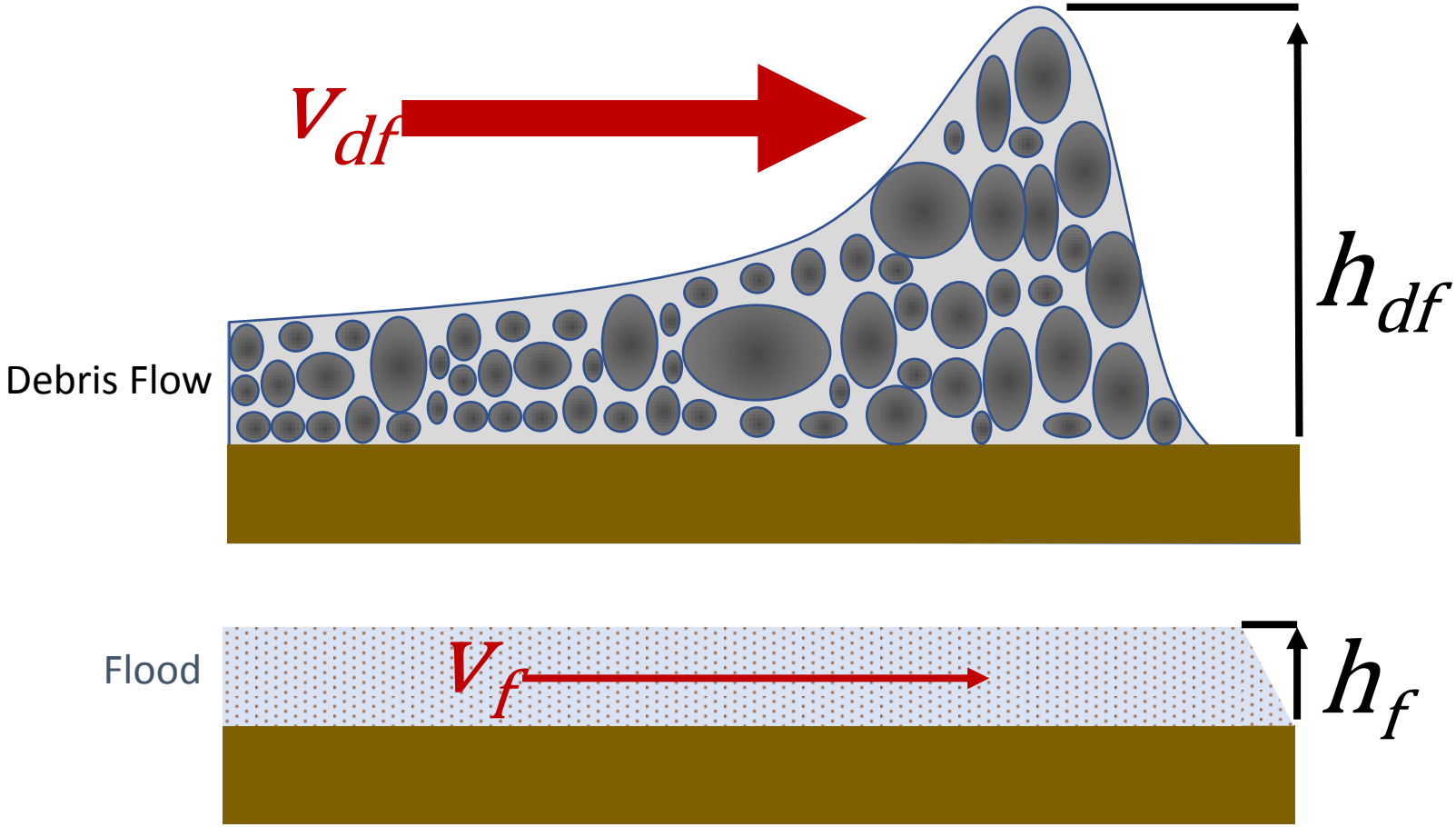
NATIONAL FLOOD INSURANCE PROGRAM

Harvard Burn Area near Burbank, CA
September 25, 2007
Photo courtesy of NOAA National Weather Service

For more information

1) National Weather Service web page: www.weather.gov
2) National Weather Service Post Wildfire Flash Flood and Debris Flow Guide (NWS Los Angeles): https://bit.ly/2Gh8CeZ
3) United States Geological Survey Post Wildfire Debris Flow Hazards: https://on.doi.gov/2m1LDw9
4) FloodSmart Flood After Fire Fact Sheet: https://bit.ly/2w18f3x
5) FEMA Flood Insurance Program: https://www.fema.gov/national-flood-insurance-program
6) National Weather Service Flash Flood and Debris Flow Web Page: https://bit.ly/2GwXbj9

All other things being equal, debris flows are worse than flash floods



Flow height (h) up to <u>5x greater</u> for debris flow

Flow velocity ($\boldsymbol{v}$) up to <u>10x greater</u> for debris flow