

# DEBRIS FLOWS

A fast, flowing landslide comprised of mud, rocks, trees, and water

Debris flows are triggered by heavy bursts of rain or rain-on-snow events



Debris flows are more likely to occur after periods of prolonged rain or snowmelt, or in years following forest fires

Houses at the base of steep slopes with mountain creeks are at greatest risk



Debris flows begin in mountain creeks and grow in size as they travel down slope, usually in surges (pulses)

Debris can bury or destroy houses



Debris can flow faster than the fastest human can run

Debris can suddenly jump out of the channel

Debris can impact houses far from the channel



Debris can sweep away or crush cars



PROTECT YOURSELF FROM

# DEBRIS FLOWS

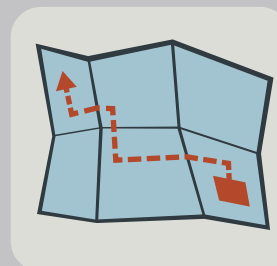
BEFORE

**Stay informed**



Keep updated with weather advisories, such as heavy rainfall warnings. Consult your local hazard map to learn where the slope hazard zones are located.

**Prepare and plan**



Prepare an emergency kit for your home, vehicle, and workplace. Plan a safe evacuation route and muster point. Know which rooms are safest if you have to shelter in place.

**Know the signs**



Look/listen for an abrupt increase or decrease in water flow, unusually muddy water, shaking ground, and a loud roar (sounds like a train or helicopter).

**Safe home design**



Put high occupancy rooms like bedrooms on the top floor and on the downhill side (away from slopes).

DURING

**DECISION: evacuate**



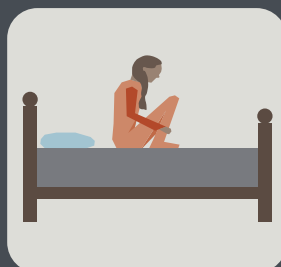
If you believe your life to be in imminent danger and you see a clear path to safety, evacuate. Get away and to higher ground as fast as you can.

**DECISION: shelter**



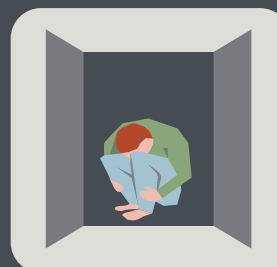
If it is unsafe to evacuate, shelter up and away. Climb to the top floor or on the roof. Shelter on the downhill side, away from the slope. Avoid basements.

**Climb on top of furniture**



Get on top of a bed or counter to avoid being swept away or buried. Do not hide behind or underneath heavy furniture as they can crush or pin you down.

**Shelter in a closet**



If you cannot escape vertically, small rooms like closets can offer additional protection from collapse if your home is buried.

**DO NOT exit out of curiosity**



Seek shelter instead of investigating the situation. Only go outside if you have to evacuate.

**DO NOT cross flood waters**



Moving water as little as 30 cm deep can quickly sweep you away. Do not attempt to drive or walk through water or debris.

AFTER

**Assume more will come**



Debris flows come in surges (pulses) and can continue for days. Subsequent pulses may be more severe than the previous.

**Make noise if buried**



Shout or tap on something so search and rescue can locate you faster.

**If safe, help neighbours**



Help evacuate your neighbours when it's safe to do so, and offer assistance to search and rescue personnel.

**Obey closures**



Evacuation orders and road closures must be taken seriously. Only return when local authorities declare it safe to do so.

## NOTES

BGC Engineering Inc. (BGC) prepared this infographic with artwork by Sophia Zubrycky. This infographic depicts some measures that may help to lower but not eliminate certain kinds of risk associated with debris flows. Simply following the measures shown in this infographic does not make it safe to occupy areas at risk of debris flows. Even if the measures shown in this infographic are taken, debris flows may still cause serious personal injury (including death) or property damage. BGC provides no guarantee or warranty of any kind related to the information in this infographic. Persons and entities using or relying on this infographic do so at their own risk. BGC will not be responsible or liable for any loss or damage including any personal injury, death, or property damage that any person or entity may suffer or sustain as a result of the information in this document, or any use of or reliance on this document.

Information on life loss risk reduction in case of debris flow impact is informed by Pollock, W., and Wartman, J. (2020) Human Vulnerability to Landslides. GeoHealth, 4, e2020GH000287. <https://doi.org/10.1029/2020GH000287>.

Photo references:

[Top right] Wildfire. Photo: Shutterstock.

[Middle left] Debris flow at Cataline Creek, BC. Photo: BGC.

[Middle right] Debris flow at Wilcox Creek, BC. Photo: BGC.

[Bottom left] Debris flow in the Austrian Alps. Photo: Shutterstock.

[Bottom right] Car swept away by debris on the Coquihalla Highway, Hope, BC. Photo: THE CANADIAN PRESS/Jonathan Hayward.