Landslide Hazards in Alaska

Alaska Division of Geological & Geophysical Surveys (DGGS)

What Causes Landslides?

Heavy **rain**, prolonged periods of damp weather, and intense, short bursts of rain may increase landslide risk. Changing climate conditions (like increased rainfall, **permafrost degradation**, **rapid snow melt**, and **glacial retreat**) can increase landslide frequency. **Earthquakes** and ground shaking may trigger landslides.

Landslide Warning Signs

Adapted from the U.S. Geological Survey's Landslide Preparedness web page
www.usgs.gov/programs/landslide-hazards/landslide-preparedness-0

Structural Signs:

- Structures like decks or patios moving relative to a main structure
- Cracking floors or foundations
- Broken waterlines or other underground utilities
- Leaning telephone poles, trees, walls, or fences
- Soil moving away from foundations

Environmental Signs:

- Wet ground that is not typically wet (new springs or saturated ground)
- New cracks or bulges in the ground
- Rapid increase in creek water levels
- Sudden decrease in water levels (even though rain may still be falling or recently stopped)
- Faint rumbling that increases in volume
- Sounds like trees cracking or rocks knocking together

If you experience any landslide warning signs or suspect an imminent landslide, evacuate immediately and inform local officials.

Landslide channel north of Sitka in 2016. Photo: Trent Hubbard, DGGS.

A landslide is the down-slope movement of earth material due to ground failure

Where do Landslides Occur?

Many regions in Alaska are prone to landslides, and they are common in Southeast, Alaska.

Areas that may be prone to landslides include:

- Places where old landslides occurred
- On or at the base of steep slopes, drainage hollows, fill slopes, and cut slopes

Landslide potential depends on many factors, including:

- Slope angle
- Rock and soil types
- Vegetation (strong root systems may help hold soil in place and reduce landslide hazard)
- Water and soil saturation
- Surface runoff
- Saturated soils

2012 Landslide near the Yukon River bridge on the Dalton Highway.

Learn more online at:
dggs.alaska.gov/hazards/landslides.html

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What to do...

During a Landslide

- Stay alert
- **Evacuate if it is safe to do so**
- If you cannot leave, move to a second story if possible

After a Landslide

- Stay away from the slide area
- Practice safety first
- Listen for advisories and warnings about major rainfall events
- Watch for flooding and continued landslide warning signs
- Assist neighbors if necessary and possible
- Look for and report broken utilities or damaged infrastructure

Once the immediate danger has passed, prioritize replanting and repairing damaged ground. This may help prevent flash flooding and other landslides in the near future. Seek advice from geotechnical experts for repairs and future hazard mitigation.

Additional Resources

DGGS Landslide Hazards Program:
dggs.alaska.gov/hazards/landslides.html

U.S. Geological Survey Landslide Program:
www.usgs.gov/programs/landslide-hazards/landslide-preparedness-0

Landslide along the Yukon River. Photo: Trent Hubbard, DGGS, 2016.

DGGS Landslide Hazards Program

Because landslides impact people and infrastructure in Alaska, DGGS conducts studies to evaluate unstable slopes and provide valuable information to the public, policy makers, and other researchers.

Geologists assess geotechnical characteristics of landslides, evaluate unstable slopes, and investigate debris flows across the state. DGGS is currently involved in a number of landslide assessment and monitoring projects, including work in Sitka, Homer, Haines, and Wrangell, along the Dalton Highway, and in Prince William Sound on the Barry Arm landslide.

Lowell Point Road landslide in Seward, 2022.

Landslide Response

In addition to ongoing projects, DGGS Landslide Hazards Program and other section staff respond to events around the state to work with other agencies and assist with monitoring and hazard evaluation.

Data Collection

DGGS collects and publishes data from around the state to identify and help mitigate landslide hazards. Some of these products include lidar data releases and landslide susceptibility maps. More information about the Landslide Hazards Program and publications can be found at dggs.alaska.gov/pubs/project/1660.

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