Landslides in Alaska

Alaska Division of Geological & Geophysical Surveys (DGGS)

Landslide

is a catch-all term that refers to mass movement of woody debris, rock, and soil

Landslides cause deaths, injuries, and homelessness, in addition to damaging or destroying buildings, roads, and other infrastructure.

Many regions in Alaska are especially prone to landslides.

A changing climate increases the risk of landslides

Landslide damage from the 1964 Great Alaska Earthquake.

Studies show that changing climatic conditions, like increased rainfall, permafrost degradation, and rapid glacier retreat can increase the frequency of fast-moving, catastrophic landslides. **Alaska's warming climate has already caused many areas to become unstable. Future warming will increase landslide risk throughout the state, especially in permafrost and glacial regions.** As populations grow and development expands into these rapidly changing areas, the destructive potential of landslides intensifies.

Alaska's landslide triggering mechanisms include:

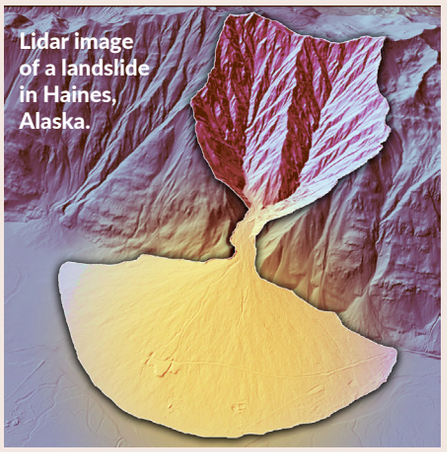
Heavy rainfall
Snowmelt
Volcanic activity
Ground water level change
Permafrost degradation
Glacial retreat
Earthquakes
Isostatic rebound

These can cause unique types of landslides, like:

Snow-ice-rock avalanches
Frozen debris flows
Submarine landslides

The DGGS Landslide Hazards Program maps and monitors landslide hazards

Elevation data is essential for mapping and response



Light detection and ranging (lidar) data is a critical tool for mapping landslides and also helps inform landslide response.

DGGS's Landslide Hazards Program conducts studies to evaluate unstable slopes and provide valuable information to policy makers, government officials, and the public.

Landslide mapping helps raise awareness and promote public safety

Maps and data products help raise public awareness of landslides and promote public safety. By providing up-to-date awareness of areas of instability before problems occur, landslide maps save time, money, and lives.

In addition to ongoing research and slope stability data collection throughout the state, DGGS staff respond to events that occur (see page 2 for recent events DGGS has responded to).

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Recent Alaska Landslides*

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**This is a select list of just a few of the many landslide events that have occurred in Alaska in recent years.*

2015

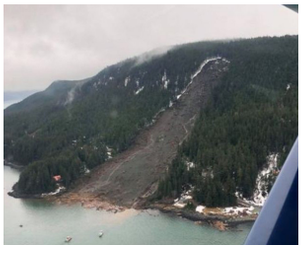
August 18, 2015

Sitka Debris Flows. Heavy rains resulted in more than 45 landslides in and around Sitka. Four debris flows (very water-rich landslides) impacted homes and infrastructure, and three lives were lost.

2016

2017

December 2, 2020



Haines Landslide. Record rainfall triggered landslides and flooding across Southeast Alaska. Multiple slope failures in Haines caused destruction and damage to homes and infrastructure, caused community evacuations, and took the lives of two Haines residents.

2018

2019

May 7, 2022

Seward Lowell Point Road Landslide. An estimated 40,000 cubic yards of debris slid down Bear Mountain, south of Seward, and blocked Lowell Point Road. No injuries were reported. This was an unusual event because typical triggers (heavy rainfall, earthquake shaking) were ruled out. A rapid increase in temperature along with rapid snowmelt and day-night temperature changes may have triggered the landslide.

2020

2021

September 26, 2022

Juneau–Gastineau Avenue Mass Wasting Event. The event damaged three homes, knocked out power, and cut off road access. No injuries were reported. Significant rainfall, high winds coupled with steep terrain, and a thin soil layer over bedrock were contributing factors to the slope failure.

2020

2023

November 20, 2023

Wrangell Landslide. Heavy rains following an unusually wet fall triggered a landslide that destroyed several homes, blocked the Zimovia Highway, and killed five residents.

2024

August 25, 2024

Ketchikan 3rd Avenue Bypass Landslide. Heavy rains resulted in a landslide that destroyed multiple homes, blocked two roads, and took the life of one resident.

2025

More information:

dggs.alaska.gov/hazards/landslides.html

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