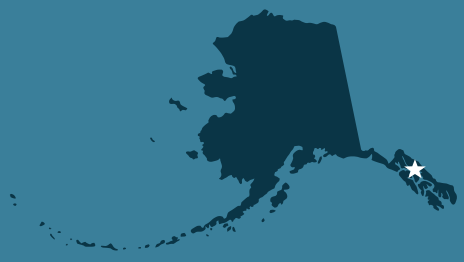
Juneau Mendenhall River Flooding



2011-2025

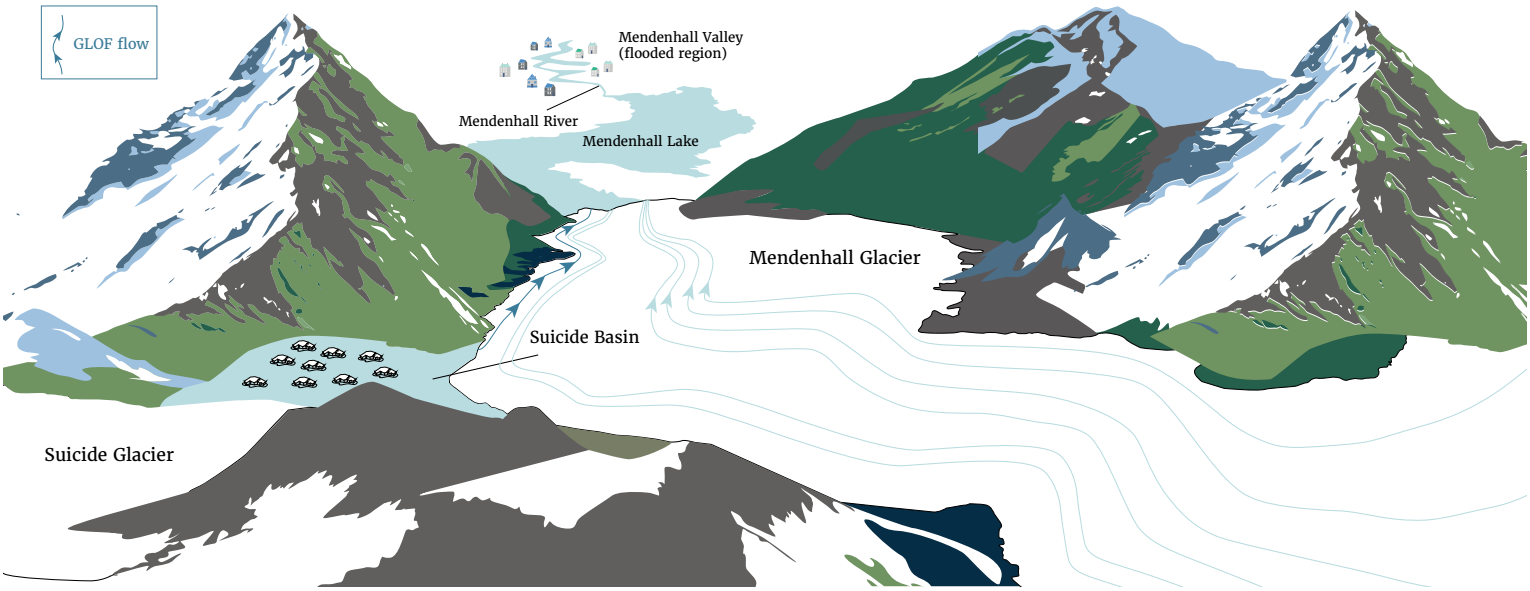
Overview

Since 2011, Suicide Basin, an ice-dammed lake along the Mendenhall Glacier, has filled with water and drains annually (sometimes multiple times a year), causing glacier lake outburst floods (GLOFs) in Juneau's Mendenhall Valley. The flood intensity depends on the amount of water released during the event (volume release) and the rate at which it flows out of the basin. In 2023, the basin started draining completely during each event (rather than partially), contributing to Mendenhall Lake and River hitting record flood stages in 2023, 2024, and 2025. This change worsened flooding impacts and caused damage to over 300 homes and up to 200 feet of riverbank erosion. Mitigation efforts involving river flood barriers are ongoing.

Suicide Basin: How does it drain?

Suicide Basin used to be filled and ice fed by Suicide Glacier hanging above the basin, but the glacier receded in recent decades to form an overdeepened basin along Mendenhall Glacier. The glacier acts as a dam and traps water from surrounding glacial melt, snowmelt, and precipitation sources. The basin collects water throughout the summer, forming a lake. Once there is enough water pressure, it lifts the Mendenhall Glacier and water drains through subglacial channels into the Mendenhall Lake and River, increasing both the lake level and river discharge which causes flooding in the Mendenhall Valley. The Valley is the most populated area in the City and Borough of Juneau.

Suicide Basin drainage system



ACCAP Alaska Center for Climate Assessment and Preparedness
A NOAA RISA team

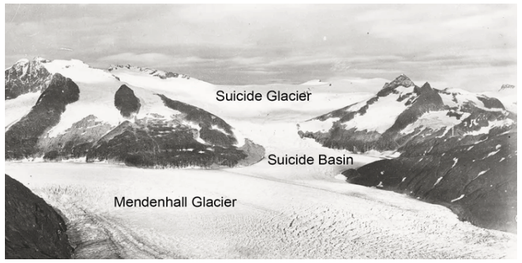
International Arctic Research Center

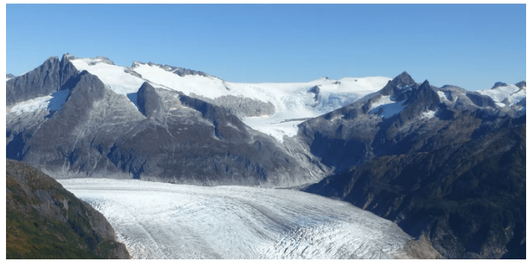
UAF University of Alaska Fairbanks

Flooding through history

History of Suicide Basin

Suicide Basin used to be part of Suicide Glacier. This photo from 1893 (left) showcases the ice-filled Suicide Basin compared with the present day exposed topographic basin (2018 photo, right).





Timeline of Glacial Outburst Flooding Events (GLOFs)

2011

July 19 -July 21, 2011: First glacial outburst flood; View Drive area evacuated, eventually flooded and city cut power; Mendenhall Campground and Brotherhood bridge trail closed; flooding and submerged vegetation reported in the Nugget Falls Trail area, Moraine Ecology trail, Skater's Cabin Road, and West Glacier Trailhead

August 19 - August 22, 2011: Heavy precipitation compounded the glacial release increased water volume; flooding on View Drive, Mendenhall Campground, and Spur Road to Mendenhall Lake

2014

July 9- July 11, 2014: Mendenhall Campground evacuated due to 3-4 feet of flooding and 150 feet of damaged roads, power cut; Skater's Cabin Road, West Glacier Road, Brotherhood Bridge, and roads leading to Meander way closed (street bordering river); flooding and power cut at View Drive; $311,000 in property damage (2014 dollars); significant bank erosion

August 11-12, 2014: Mendenhall campground flooded with 2 feet of water and closed, West Glacier Spur Road flooded and 3 hikers had to be rescued due to stuck vehicle, View Drive flooded and one house suffered significant damage

2016

June 29-July 2, 2016: Mendenhall Campground evacuated due to 3 feet of water; Nugget Falls trail, Photo point trail, and Skater's Cabin Road closed; View Drive flooded with 2 feet of water and isolated from town, Dredge lakes trail and Mendenhall Glacier visitor center flooded

2018

July 17-19, 2018: Mendenhall Campground evacuated due to 3 feet of water, Skater's Cabin, and West Glacier Trail closed; View Drive flooded with 2 feet of water and flooding at Back Loop Road

2020

July 20-August 1, 2020: Mendenhall Campground evacuated due to flooding and road damage; Flooding around Mendenhall Lake and upper river above Back Loop Road; Skater's Cabin area flooded with 3 feet of water, View drive flooded with 2 feet of water

2022

October 24-27, 2022: Flooding at Mendenhall Campground and Skater's Cabin Road, erosion around Mendenhall Campground,

2023

Historic, high volume events in **2023**, **2024**, and **2025** involved the complete drainage of Suicide Basin and extensive impacts in the Mendenhall Valley.

2024

See event spotlights on the next page.

2025

Event Spotlight: August 3-5, 2023

Flooding in areas that had not previously flooded; buildings on the river bank, Mendenhall Campground, and View Drive evacuated; emergency personnel rescued six families from homes in high water; widespread power outages, citizens transported generators via boats to help friends without power; one home fell into the river, **13 homes destroyed, 8 with major damage, 7 with minor damage, $7 million estimated property damage; 50-200 feet of erosion on river banks**; flooding tore loose oil tanks from homes and contaminated river and shoreline; household debris, silt, trees strewn on river banks and streets; local emergency declared

August 2023 Mendenhall River looking at a house that fell into the river and another damaged house. Photo by Juneau NWS.

Event Spotlight: August 3-6, 2024

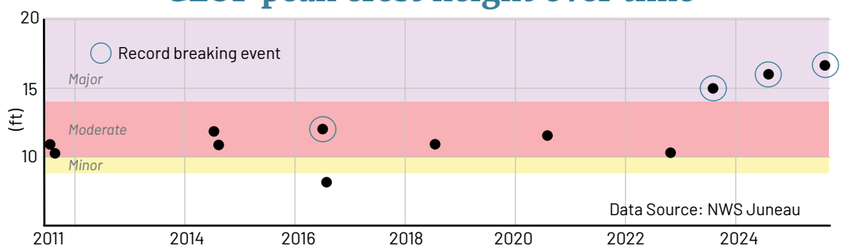
Most water released in a single flood (16 billion gallons); **flooding in areas that had not previously flooded**; 40 people sheltered overnight at local school; emergency personnel rescued multiple people from their homes; 1-6 feet of flooding at homes west of Riverside Drive, 4-7 feet of water at View Drive, flooding at Brotherhood Bridge and Mendenhall Valley Library; **300 homes majorly affected** and hundreds of vehicles flooded; **$6.66 million estimated property damage**; extensive power outages; fuel oil spills; **federal disaster declared**, FEMA approved **$885,875** in **public assistance** and **$3,729,035** in **individual assistance**

August 2025 flood photo by City and Borough of Juneau

Event Spotlight: August 12-13, 2025

Glacier Spur Road closed; **flood impacts not as severe as 2024 due to flood barriers installed along Mendenhall River**, 4-5 feet of water at View Drive, backed up storm drains caused flooding at Brotherhood Bridge, flooding at Skater's Cabin Road and low points of River Road; **25 affected homes, 6 with major damage and 11 with minor damage, $5.89 million estimated property damage;** severe river erosion along the left river bank caused the sidewalk to fall into the river, cutting off telecommunication and power lines; utility pole fell into the river which cut power and internet

GLOF peak crest height over time



Change over time

River crests have increased over time, with **2016, 2023, 2024,** and **2025** all breaking records (denoted by blue circles).

Research and Mitigation

An evolving system

Many aspects of the Mendenhall Glacier system are changing, creating **uncertainty** around future flooding events. As the glacier **thins**, the height of the glacial dam **decreases**, diminishing the glacier's ability to trap water in the basin; this will **decrease flood severity**. However, the Mendenhall Glacier is also **calving**, increasing the volume of Suicide Basin and the water stored within it (basin expansion). **Icebergs** in the basin are also **melting**, **increasing** the amount of **liquid water** stored in the basin, and **potentially creating more severe floods**. These three opposing forces create uncertainty around the future of GLOFs in the Mendenhall Valley.

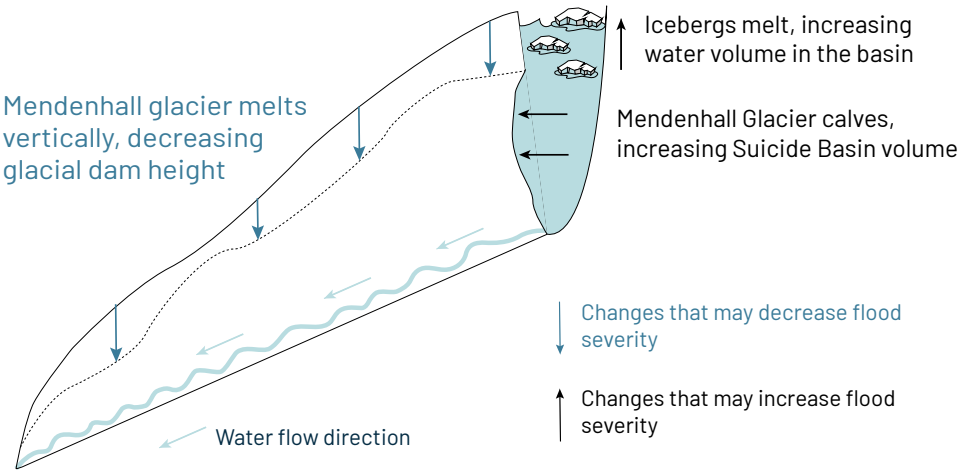


Figure adapted from First Things First Alaska Foundation

Research

Researchers at University of Alaska Southeast and University of Alaska Fairbanks use **drones** to create 3-D elevation models of Suicide Basin and understand how its volume and topography are changing. They also use **ice-penetrating radars** to investigate the internal structure of the Mendenhall Glacier and map the base of the glacier. Both techniques can be used to **quantify** changes to the Mendenhall Glacier System and understand how GLOFs from Suicide Basin are likely to evolve in the future.

Mitigation

In March 2025, the U.S. Army Corps of Engineers (USACE) shipped flood mitigation supplies like sandbags, superstacks, and polyethylene sheeting to build a flood barrier (also known as HESCO barriers) along the Mendenhall River. The City and Borough of Juneau's partial installation was effective during the record high waters in August 2025, and such efforts will continue in an effort to protect the Mendenhall Valley from flooding and erosion. The entire flood barrier is expected to be completed by Summer 2026.

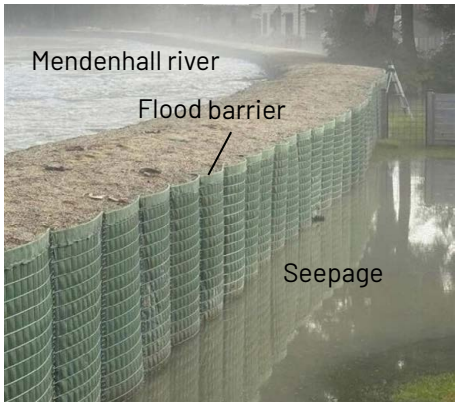


Photo by USACE

Explore other extreme events at **uaf-accap.org/projects/extreme-events-library**

Sources: Alaska Climate Adaptation Science Center, Climate.gov, FEMA Disaster Declarations, First things First Alaska Foundation, Glacial Lake Outburst Floods via Congress.gov, Juneau Empire, Juneau Glacial Flood Dashboard, NOAA Storm Events Database, Thoman, R. Juneau's Glacial Lake Outburst Flooding, U.S. Department of War