



Jökulhlaup



What is a Jökulhlaup? A Jökulhlaup (“Yo-kel-yawp”) is a glacier-dammed lake outburst flood. This is a unique and unusual flooding event that occurs in Southeast Alaska, most often during the summer. Jökulhlaups can cause significant flooding along rivers fed by the parent glacier. Forecasting these events can be difficult due to unknown volume of water in these lakes and other factors. Other hazards also include large chunks of ice and other large debris which are washed downstream with the floodwaters.



Left: Outflow from the Mendenhall Glacier during a Jökulhlaup on August 19, 2011

Below: Flooding along View Dr. in Juneau during a Jökulhlaup on August 19, 2011

What Causes a Jökulhlaup?

Glaciers often have lakes either between the ice and the valley walls, beneath or inside the glacier, or even on top of the glacier itself. These glacier lakes are filled with rainwater and also meltwater during the spring and summer. As the glacier dammed lakes fill, they exert pressure on the ice above and around them. Glacier dams can release as the water below lifts the ice, or by the breaking off or calving



of the ice surrounding the glacier lake. This allows the water that has accumulated over time in the glacier-dammed lake to flow out all at once. A flood from a Jökulhlaup will often take 2-4 days to complete the process from the initial rise to receding below flood stage.

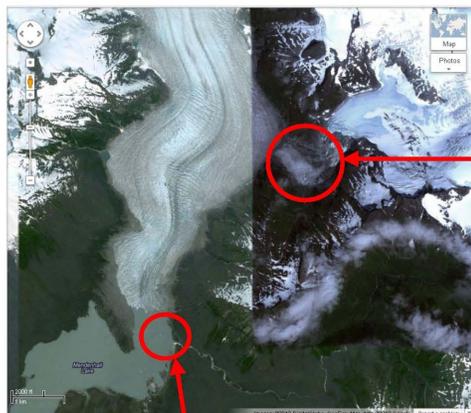


Glacially Dammed Lakes in the Juneau area



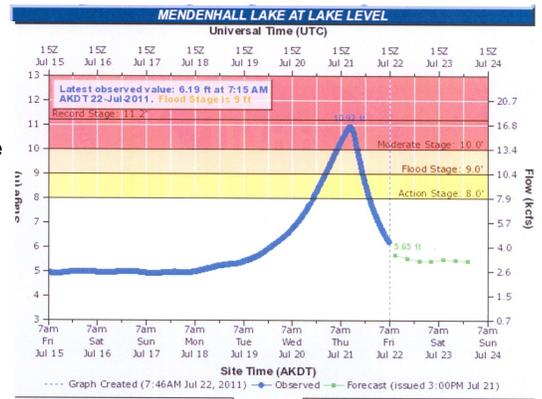
Juneau

Mendenhall Lake/River (Suicide Basin): The first recorded jökulhlaup on the Mendenhall River occurred in July of 2011. As a result near record flooding occurred on Mendenhall Lake and River. Significant flooding was reported along View Drive and water inundated the Mendenhall Campground. At the time of this event, there was not much known about a glacially dammed lake outburst on the Mendenhall Glacier. Since 2011, significant progress has been made on better understanding, monitoring and forecasting this phenomenon. The USGS now maintains a gauge in Suicide Basin that monitors water levels in the basin and allows forecasters to better determine how much water will enter into the lake and river.



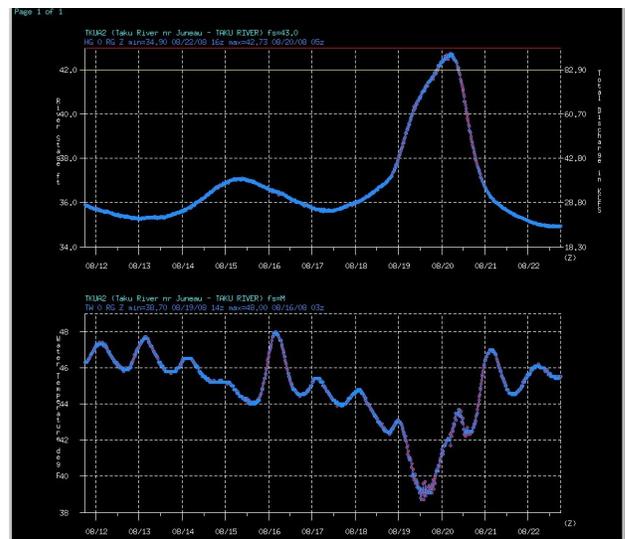
Nugget Falls

Location of Suicide Basin about 1-2 miles from the terminus.



Hydrograph for the first recorded jökulhlaup in Southeast Alaska from Suicide Basin

Taku River (Tulsequah Lake and Lake No Lake): Tulsequah Lake and Lake No Lake are dammed by the Tulsequah Glacier in British Columbia, Canada. These lakes fill through the spring into the summer from snowmelt, and then empty through glacial tunnels into the Tulsequah River. The Tulsequah River joins the Taku River less than 10 miles upstream from the USGS river gauge. When there is an outburst event, the water temperature will fall rapidly from the typical diurnal trend. This is shown by the water temperature graphic on the bottom right of this page. Rising water levels and rapidly falling water temperatures are major indications to forecasters that an outburst event is occurring on the Taku River.



Hydrograph and Water Temperature during Aug 18-20th 2006