



Weather & Climate Summary Wrangell-St. Elias National Park & Preserve Winter 2020

Mt. Drum in Wrangell-St. Elias. NPS Photo by Bryan Petrtyl.

Gulkana and Yakutat Winter 2019-2020

Long-term climate records from Gulkana and Yakutat allow us to put the winter of 2019-2020 into context. It was the coldest winter season in Gulkana in eight years. Overall, the average winter temperature was -3.3°F cooler than normal. Yakutat ended up warmer than normal for the season even with a cold January, thanks in part to a very warm December (Figure 1, Table 1).

December: The first half of the month was very warm in Yakutat with new record daily highs on three consecutive days — December 13th (56°F), 14th (58°F), and 15th (61°F). The monthly average temperature was 8.3°F warmer than normal, an impressive statistic for a Gulf Coast community that is moderated by ocean temperatures. It was the second warmest December on record in Yakutat behind 1930. Gulkana was also warmer than normal in December. The normal temperature for December is 0.4°F and this December was 3.8°F. The last two days of the month were pushing into record high territory but fell shy by a degree or two.

January: In Gulkana, January temperatures were cooler than normal for most of the month, with only a few days that were warmer than normal. The average temperature was an impressive -13.1°F cooler than normal and the 12th coldest January on record. After a warm December, temperatures in Yakutat also cooled down considerably with the monthly average temperature coming in -5.8°F cooler than normal. The middle of the month, smack dab in the middle of climatological winter, was the coldest period at both locations.

February: February was just about normal in Gulkana, although you can see on the graph that all days were not

created equal. The normal monthly temperature was a combination of warmer than normal and cooler than normal daily temperatures that played out throughout February. In Yakutat it was similar, but the variability was more subtle.

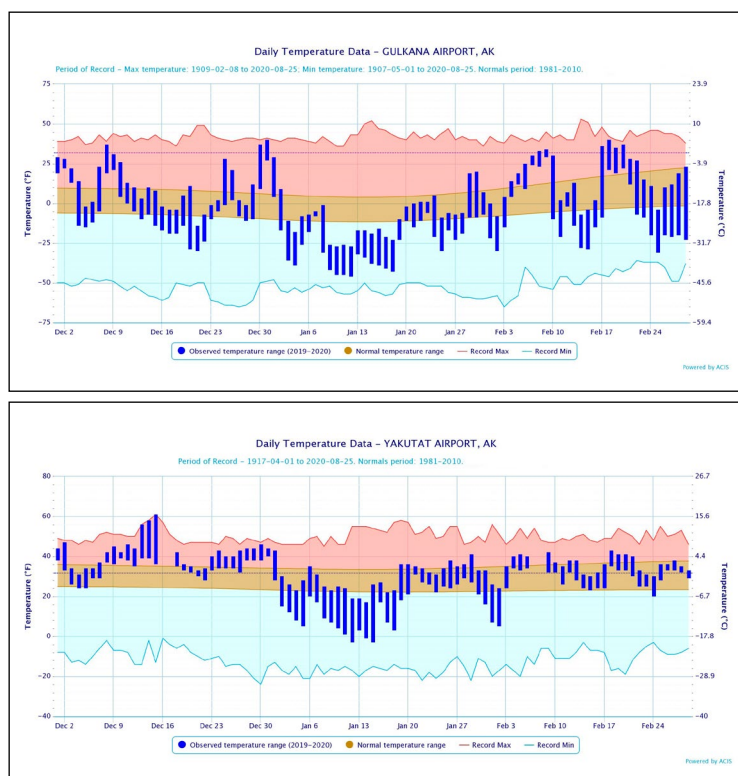


Figure 1. Winter 2019-2020 daily temperatures at Gulkana (top) and Yakutat (bottom) showing record maximum (red), record minimum (blue), normal (brown) and observed range (blue bars).

Table 1. Temperature: Gulkana and Yakutat Winter 2019-2020 temperatures compared to 1981-2010 normals.

Gulkana Winter 2020	Average Monthly Temp (°F)	1981-2010 Normal (°F)	Departure from Normal (°F)	Monthly High (°F / Date)	Monthly Low (°F / Date)
December	3.8	0.4	+3.4	40 / Dec 30	-30 / Dec 21
January	-16.0	-2.9	-13.1	29 / Jan 1	-46 / Jan 12
February	5.4	5.5	-0.1	40 / Feb 18	-31 / Feb 25

Winter Season Temperature Departure from Normal: : -3.3°F.

Yakutat Winter 2020	Average Monthly Temp (°F)	1981-2010 Normal (°F)	Departure from Normal (°F)	Monthly High (°F / Date)	Monthly Low (°F / Date)
December	37.9	29.6	+8.3	61* / Dec 15	24 / Dec 5
January	22.3	28.1	-5.8	43 / Jan 1	-3 / Jan 12, 15
February	31.5	29.7	+1.8	43 / Feb 18	5 / Feb 2

Winter Season Temperature Departure from Normal: +1.4°F; *Record daily high.

Gulkana and Yakutat Winter Precipitation 2019-2020

The total precipitation for the 2019-2020 winter season was 153% of normal in Gulkana; February was the wettest month of the winter. Yakutat precipitation was below normal for the winter at 78% of normal (Figure 2; Table 2). We can assume that most of the precipitation in Gulkana was snow, in Yakutat it was likely a mix of rain and snow. Snowfall measurements are no longer recorded at either site.

December: Gulkana precipitation was about 156% of normal in December with 1.22 inches of total precipitation measured during the month. Yakutat had near normal precipitation in December, every day in December had at least a trace of precipitation recorded in the typical temperate rain forest fashion. Total liquid precipitation for December was 16.90 inches (near normal).

January: It was dry in January in Gulkana with only 0.15 inches record for the entire month, this is the 12th driest January on record at this site. Yakutat precipitation was also well below normal. With a total of 4.49 inches, only 33% of normal, it ranked as the 9th driest January on record.

February: It was a snowy month in Gulkana with 1.31 inches of melted snow recorded for the month, which is 256% of normal. After a very dry January this ended up as the 6th wettest February on record. There were two storms that accounted for most of the precipitation gain, one near the end of the first week and another near Valentine's Day. In Yakutat, precipitation was once again near normal and like December there was measurable precipitation every day of the month. A total of 10.31 inches was recorded, normal is 10.86 inches for February

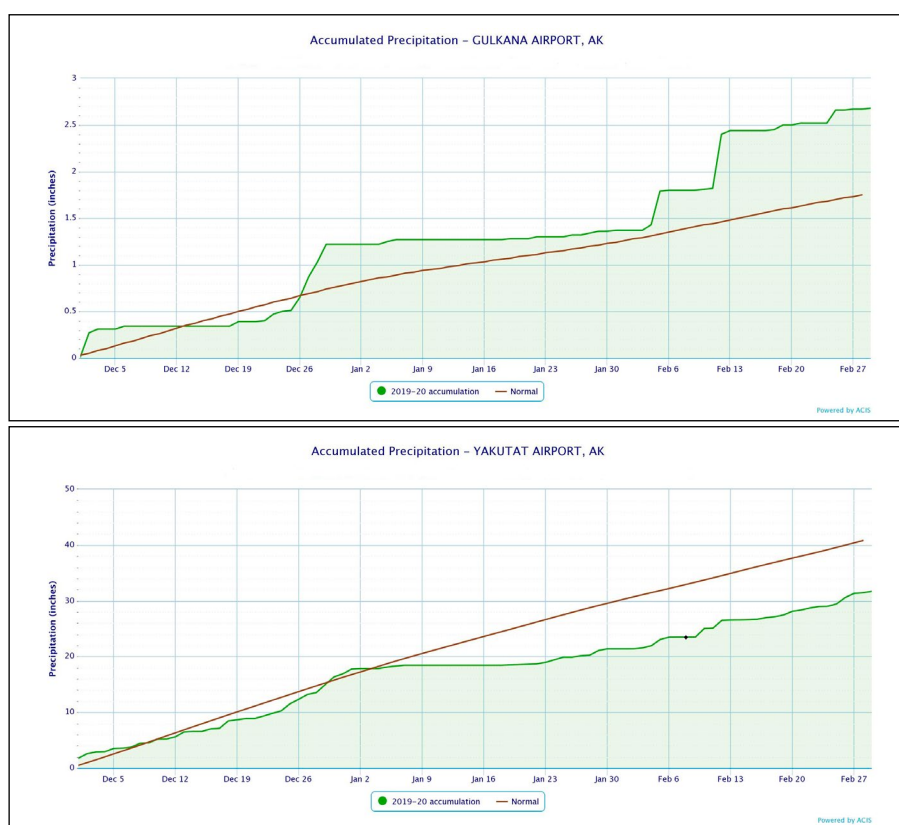


Figure 2. Winter 2019-2020 accumulated precipitation (green) at Gulkana (top) and Yakutat (bottom) compared to normal (brown line).

Table 2. Precipitation: Gulkana and Yakutat Winter 2019-2020 precipitation totals compared to 1981-2010 normals.

Gulkana Winter 2020	Total Monthly Precip. (in.)	1981-2010 Normal (in.)	Departure from Normal (in.)	Greatest 24 -hr. total (in. / Date)	# Days with ≥ 0.01 in. water
December	1.22	0.78	+0.44	0.26 / Dec 2	13
January	0.15	0.46	-0.31	0.03 / Jan 5	8
February	1.31	0.51	+0.80	0.58 / Feb 12	13

Winter Season Departure from Normal: : +0.93 inches (153% of normal).

Yakutat Winter 2020	Total Monthly Precip. (in.)	1981-2010 Normal (in.)	Departure from Normal (in.)	Greatest 24 -hr. total (in. / Date)	# Days with ≥ 0.01 in. water
December	16.90	16.28	0.62	1.77 / Dec 1	29
January	4.49	13.66	-9.17	0.87 / Jan 1	16
February	10.31	10.86	-0.55	1.55 / Feb 10	25

Winter Season Departure from Normal: -9.1 inches (78% off normal).

Many Ways to Measure Snow

We monitor snow conditions a number of ways throughout WRST including snow surveys that are done once a month in winter by park staff to record snow depth, density, and snow water equivalent (Figure 3) as well as aerial surveys where park staff fly by snow markers and record the snow depth.



Figure 3. Paul Atkinson (NPS) at the Lost Creek snow survey site in WRST.

We also have acoustic depth sensors at our climate stations that allow us to track snow depth and last, but not least, we have a few ‘high-tech’ sites at May Creek and Chisana that record continuous year-round precipitation (rain, snow, and everything in between). All of these measurements give us a good indication of whether it’s a good snow year or a bad snow year, which impacts almost every other component of the ecosystem in WRST.

2019-2020 Winter Snow

There was 21 inches of snow on the ground at May Creek at the end of February and 16 inches at Chisana, which is the average depth for both sites based on the period of records (2009-2020). We also track the accumulated precipitation by Water Year (October 1-September 30) in order to capture the entire winter season. Since October 1, Chisana has accumulated 4.5 inches of liquid precipitation (rain and melted snow), which is



Figure 4. Camera image from Gates Glacier climate station February 29, 2020 with 71 inches of snow on the ground.

higher than the average 3.6 inches for the end of February. May Creek accumulation at the end of February was right at average at 5.9 inches. The deep mountain snowpack was captured at the Gates Glacier site in the Wrangell Mountains where there was 71 inches of snow at the end of February (Figure 4). Tana Knob and Tebay in the Chugach Mountains had 60 and 61 inches, respectively, at the end of February.

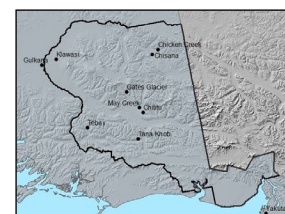
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Data disclaimer: Please note that the near-real time data used to generate these reports is subject to change. QA/QC data from the NPS CAKN climate stations are available at [NPS Data Store](#)