

Central Alaska Network

National Park Service
U.S. Department of the Interior

Alaska Region
Inventory & Monitoring Program



Denali NP & Pres. • Wrangell-St. Elias NP & Pres. • Yukon-Charley Rivers N Pres.

Winter 2017-2018

Weather & Climate Summary Wrangell-St. Elias National Park & Preserve Winter 2017-2018

Gulkana and Yakutat Winter Weather 2017-2018

Long-term climate records from Gulkana and Yakutat allow us to put the winter of 2017-2018 into context. There was quite a bit of daily temperature variability in December and January in both locations. Despite the temperature swings, the average winter temperature ended up near normal for Gulkana and 1.2°F warmer than normal for Yakutat (Figure 1, Table 1).

December 2017: Gulkana had a warm December. The average monthly temperature of 9.5°F was 9.1°F warmer than normal. It was the 6th warmest December on record. Temperatures were well above normal for the first 2.5 weeks before dipping below normal around Christmas. Yakutat was also very warm the first half of December with eight new daily record highs set; it then cooled right off during the third week with low temperatures in the single digits. Overall the monthly temperature averaged 31.5°F which was 1.9°F warmer than normal for Yakutat.

January: In Gulkana, January temperatures were variable with warm spikes in early and mid-January and a cool couple of days around the 9th and then again starting on the 24th through the end of the month. The average monthly temperature ended up near normal at -3.4°F. In Yakutat there were six missing days of temperature observations, which is quite unusual. With the missing dates, the average temperature was 32.6°F, 4.5°F warmer than normal.

February: February was cold in Gulkana with temperatures well below normal during the first week. Unlike earlier in the winter, February temperatures were below normal for most of the month with only 5 of the 31 days having warmer than normal daily temperatures. Overall, February in Gulkana was

~9°F colder than normal. Yakutat was also cooler than normal the first week of February, and then temperatures stayed in the normal range, with a slight cool tilt for the rest of the month. Yakutat ended the winter with February temperatures that were, on average, -2.7°F cooler than normal for the month.

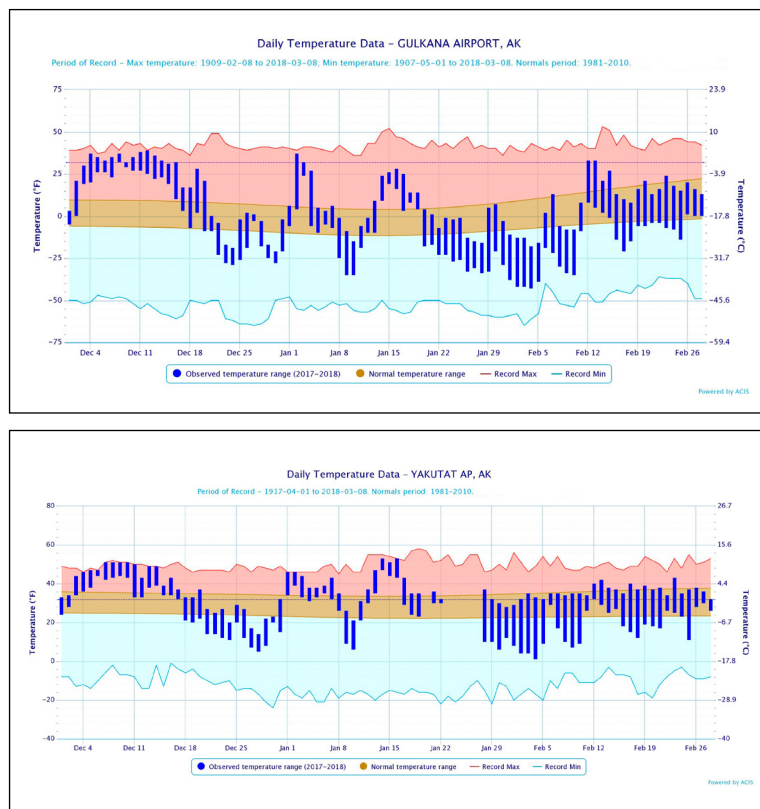


Figure 1. Winter 2017-2018 daily temperatures at Gulkana (top) and Yakutat (bottom) showing record maximum (red), record minimum (blue), normal (brown) and observed range (blue bars).

Table 1. Temperature: Gulkana (top) and Yakutat (bottom) winter 2017-2018 temperatures compared to 1981-2010 normals.

Gulkana Winter 2017-2018	Average Monthly Temp °F	1981-2010 Normal °F	Departure from Normal °F	Monthly High °F / Date	Monthly Low °F / Date
December	9.5	0.4	+9.1	39 / Dec 12	-29 / Dec 24
January	-3.4	-2.9	-0.5	37 / Jan 2	-35 / Jan 9, 10
February	-3.4	5.5	-8.9	33 / Feb 12, 13	-43 / Feb 4

Winter Season Temperature Departure from Normal: -0.1°F.

Yakutat Winter 2017-2018	Average Monthly Temp °F	1981-2010 Normal °F	Departure from Normal °F	Monthly High °F / Date	Monthly Low °F / Date
December	31.5	29.6	+1.9	51 / Dec 7-10*	5 / Dec 28
January	32.6**	28.1	+4.5	53 / Jan 14, 16*	6 / Jan 10, 30
February	27.0	29.7	-2.7	43 / Feb 23	1 / Feb 4

Winter Season Temperature Departure from Normal: +1.2°F. *Record daily high; **There were 6 missing days in January.

Gulkana and Yakutat Winter 2017-2018 Precipitation

It was the wettest (snowiest) winter on record for Gulkana! The precipitation total of 4.46 inches (water equivalent of the snow) was ~255% of normal. Yakutat precipitation was below normal for the winter at 77% of normal. There were many missing snowfall observations in January and February, so the winter snowfall totals could not be calculated (Figure 2; Table 2 and 3).

December: Gulkana precipitation was about 245% of normal in December with 1.91 inches of total precipitation measured during the month. Snowfall is not recorded at this location. Yakutat had near normal precipitation in December, but it fell as rain rather than snow. Total liquid precipitation for December was 16.91 inches (near normal), yet the snowfall total of 11.3 inches was only 49% of normal.

January: Gulkana precipitation was again well above normal in January with a total snow water equivalent of 1.88 inches. Thirteen days of the month had missing snowfall data for Yakutat, so the total for the month cannot be calculated. Rainfall was measured on all but 3 days; the total for the month was 10.30 inches, which was ~75% of normal.

February: In Gulkana, the precipitation total for February remained above normal at 0.67 inches, which is 131% of normal. In Yakutat, precipitation was light with only 4.31 inches recorded for February, normal is 10.86 inches. The recorded

snowfall total was 17.2 inches; this month there were seven missing observations for snowfall.

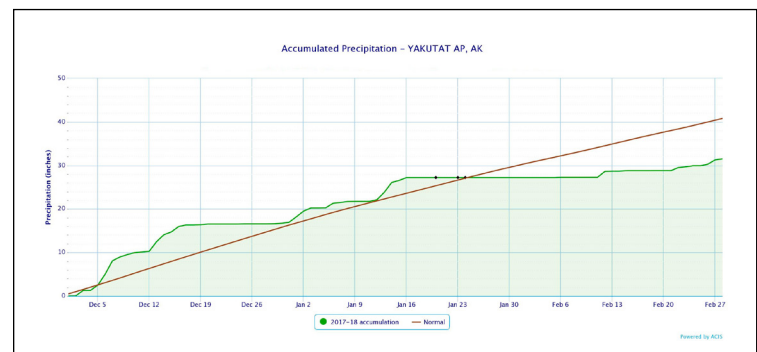
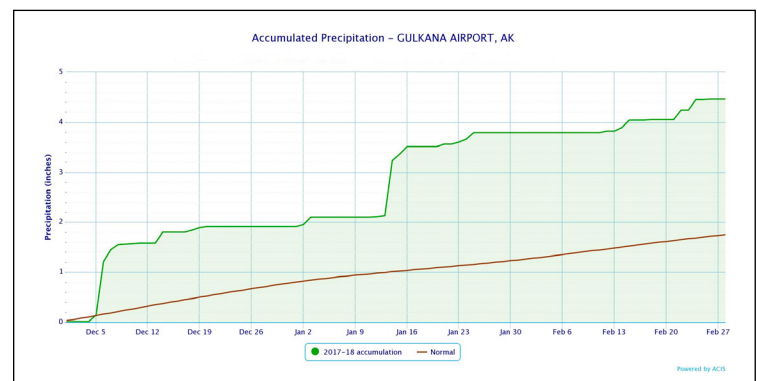


Figure 2. Winter 2017-2018 accumulated precipitation (green) at Gulkana (top) and Yakutat (bottom) compared to normal (brown line).

Table 2. Precipitation: Gulkana (top) and Yakutat (bottom) winter 2017-2018 precipitation totals compared to 1981-2010 normals.

Gulkana Winter 2017-2018	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	1.91	0.78	+1.13	1.07 / Dec 6	12
January	1.88	0.46	+1.42	1.10* / Jan 14	11
February	0.67	0.51	+0.16	0.21 / Feb 24	7

Winter Season Departure from Normal: +2.71 inches (255% of normal); Wettest winter on record; *Record daily high.

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Table 2. Continued...

Yakutat Winter 2017-2018	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	16.91	16.28	0.63	3.09 / Dec 7	22
January	10.30	13.66	-3.36	2.25 / Jan 14	13
February	4.31	10.86	-6.55	1.34 / Feb 12	13

Winter Season Departure from Normal: -15.11 inches (77% off normal); 3 missing days in January.

Table 3. Snowfall: Winter 2017-2018 monthly snowfall totals at Yakutat compared to normal (snow is not measured at Gulkana).

Winter 2017-2018	Total Monthly Snowfall in.	1981-2010 Normal in.	Departure from Normal in.	Greatest 24 -hr. Snow-Fall Total in. / Date	Cumulative snowfall since 1-July in.
December	11.3	23.2	-11.9	3.1 / Dec 31	38.1
January	m	31.9	m	m	m
February	17.2*	28.6	-11.4	7.0 / Feb 22	m

*Snowfall observations were missing for 7 days, so this number may be lower than the actual snow total.

Snowpack Development at Chisana for 2017-2018

The Chisana SNOTEL (elev. 3320") was installed in 2007. This is one of two sites in the heart of the park that measure year-round precipitation, including rain, snow, and mixed precipitation. They are operated in partnership with the Natural Resources Conservation Service (NRCS). Figure 3 shows the snowpack development at Chisana for the 2017-2018 snow season (red line) compared to last year (blue line).

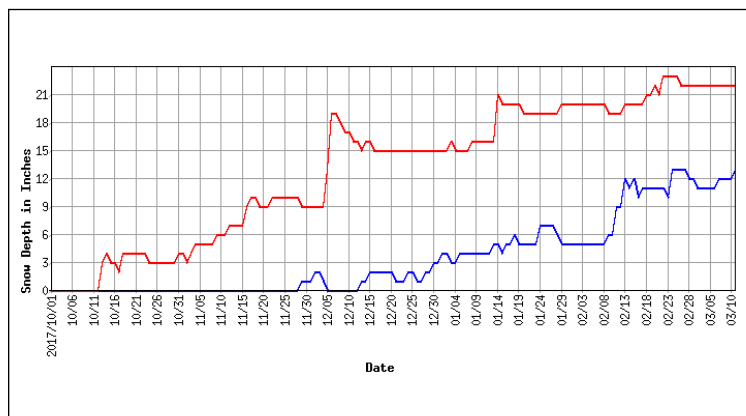


Figure 3. Snowfall accumulation at Chisana 2017-2018 (red line).



Climate Monitoring in Wrangell-St. Elias

The NPS climate stations in Wrangell-St. Elias have been collecting climate data for the past decade as part of the Central Alaska Network climate monitoring program (Figure 4). The NPS stations complement long-term records available from the National Weather Service stations in Gulkana and Yakutat. The NPS stations are providing critical data at higher elevations which helps characterize climate gradients and patterns affecting resources in Wrangell-St. Elias National Preserve.

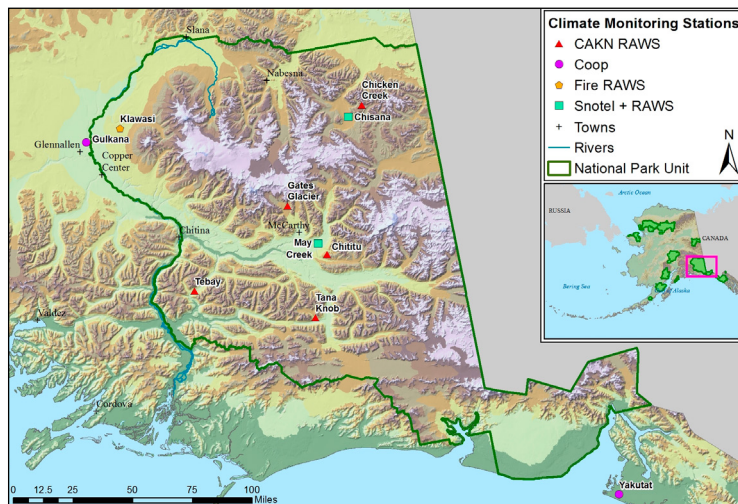


Figure 4. NPS climate stations in Wrangell-St. Elias NP&P.

More Information

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[Current weather in Wrangell-St. Elias](#)