

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

Spring 2023

Weather & Climate Summary Wrangell-St. Elias National Park & Preserve Spring 2023

Gulkana Spring 2023 Weather Summary

Spring

Weather observations have been recorded at Gulkana since 1943. We'll look at spring conditions (March, April, May) in respect to the latest climate normal period, 1991-2020, and highlight data from a few of the Central Alaska Inventory and Monitoring Network (CAKN) climate sites.

Overall, spring was cooler and wetter than normal. Weather highlights for the season include a cold April, snowmelt flooding in mid-May, and a record-breaking precipitation event at the end of May. The average temperature for the 2023 spring season was 28.4°F, a chilly 2.7°F below the 1991-2020 normal. Each month was wetter than normal this spring leading up to a spring season total of 2.48 inches of precipitation – almost triple the normal amount (Table 1 and 2, Figures 1 and 2).

March

The average March temperature was near normal at 14.8°F. At a time of the year with rapidly increasing solar radiation, daily maximum temperatures typically increase as the month progresses. Daily high temperatures usually aren't above freezing until the last week of March, but highs of 39°F on the 8th and 9th ended up as the monthly maximums. This was followed by a relatively cool period; the monthly low was -20°F on March 12. The total precipitation (melted snow and rain) for the month was 0.48 inches, which is a bit more than the normal 0.34 inches. Gulkana is situated in a major rain shadow with the Chugach Mountains to the south and the Wrangell Mountains to the east. The spring season is typically the driest time of year.

April

At Gulkana, the average temperature for April was 26.8°F which is -5.8°F below normal. This ranks as the 12th coldest April on record and the coldest since 2013. Almost every day of the month had below normal average temperatures, but no records were broken. Total precipitation was well above normal for the month with a big chunk of the monthly total falling as a rain/snow mix on April 29.

Late spring in the Wrangell Mountains. NPS Photo by Ken Hill.

May

Low elevation snow began rapidly melting in May and low-lying areas in Glennallen experienced flooding which contaminated water sources and closed schools and businesses. Air temperatures at Gulkana were below normal the first week of the month, above normal through the middle of the month, and cooled off again at the end of May. The average temperature for the month was 43.5°F, more than two degrees colder than normal. May was dry for the first three weeks, but ended up much wetter than normal due to heavy rain the last several days of the month. A total of 2.21 inches of rain was recorded at Gulkana May 29-31 which is the third highest 3-day total for anytime of year. Coupled with the heavy precipitation, cool temperatures meant that slightly higher elevations received accumulating snow during this event rather than rain. Overall, May precipitation totaled 2.41 inches, which is 317% of normal.

Table 1. Spring 2023 average monthly temperatures compared to the 1991-2020 normal.

Spring 2023	Average Monthly Temp (°F)	1991-2020 Normal (°F)	Departure from Normal (°F)
March	14.8	14.7	+0.1
April	26.8	32.6	-5.8
May	43.5	45.8	-2.3

Spring Temperature Departure from normal: -2.7°F

Table 2. Spring 2023 monthly precipitation totals compared to normal.

Spring 2023	Total Monthly Precip. (in.)	1991-2020 Normal (in.)	Departure from Normal (in.)
March	0.48	0.34	+0.14
April	0.91	0.22	+0.69
May	2.41	0.76	+1.65

Spring Precipitation Departure from normal: +2.48 in. (288% of normal).

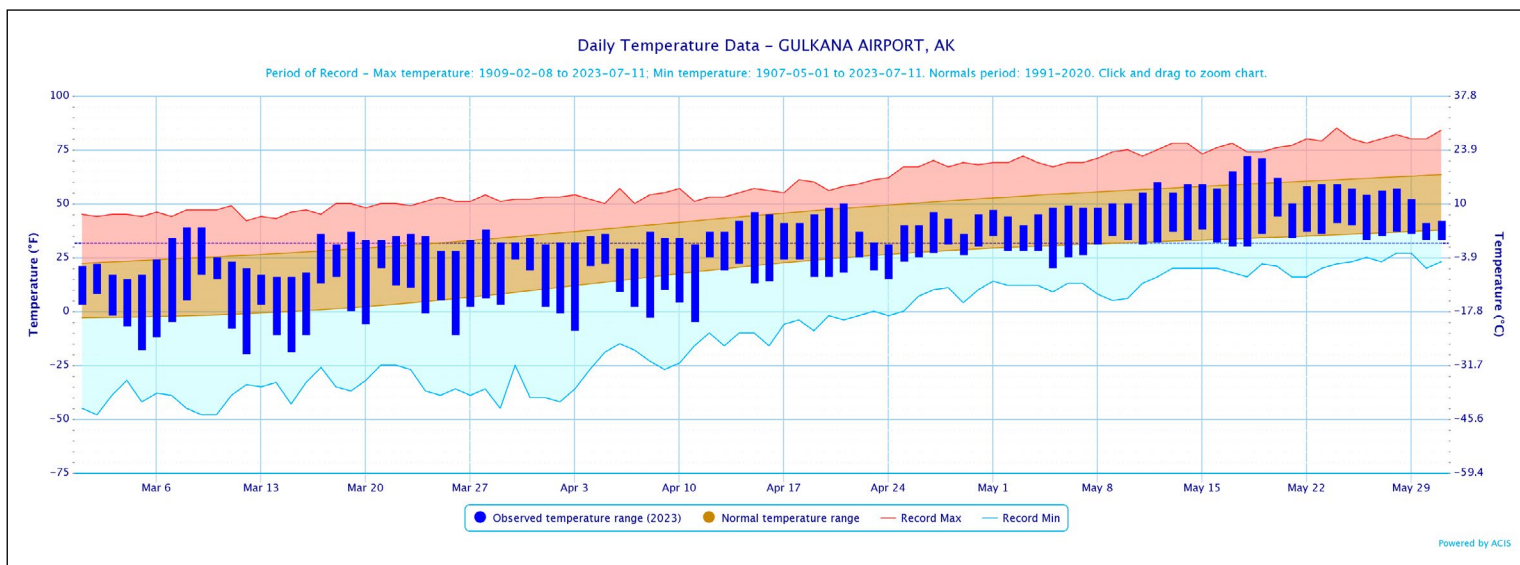


Figure 1. Spring 2023 daily temperatures at Gulkana showing record maximum (red), record minimum (blue), normal (brown) and observed range (blue bars).

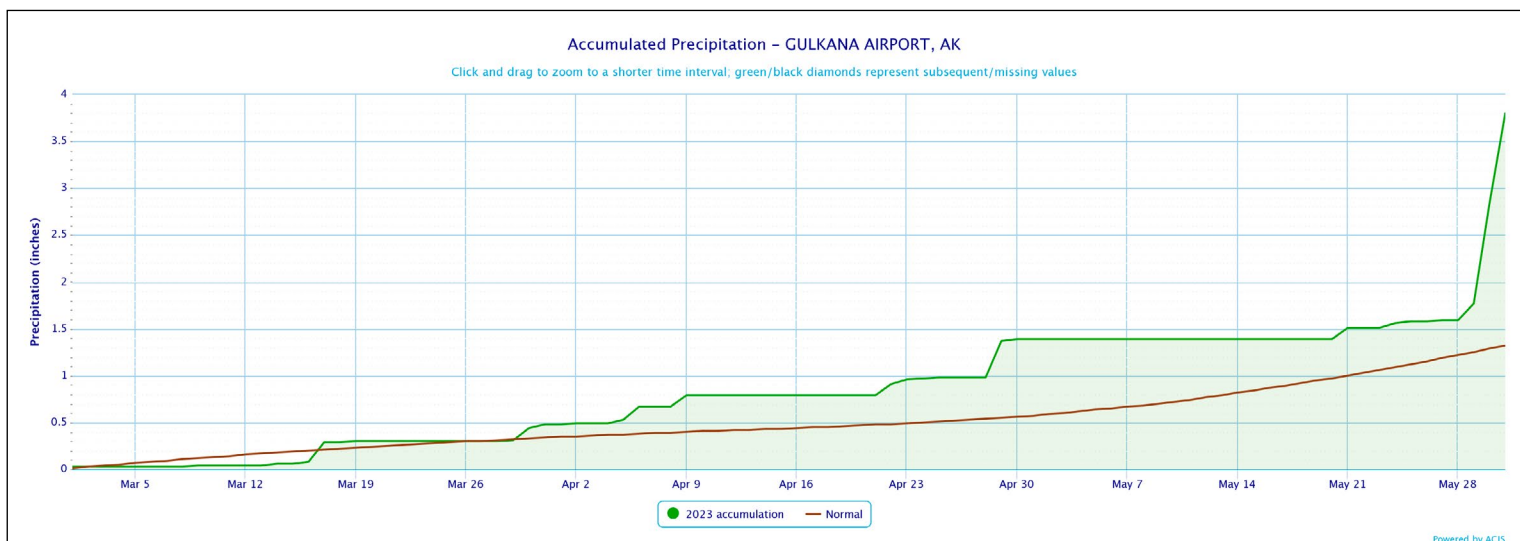


Figure 2. Spring 2023 accumulated precipitation (melted snow and rain) at Gulkana (green) compared to normal (brown line).

Yakutat Spring 2023 Weather Summary

Spring

Weather observations have been recorded at Yakutat since 1917 (with some gaps in the early decades). Overall, spring was cooler and drier than normal. Weather highlights for the season include a very cold early March, heavy snow March 1-2 and March 15-16, a relatively dry April, and a wet late-May. The average temperature for the 2023 spring season was 37.4°F, 1.3°F below the 1991-2020 normal. Precipitation was 90% of normal with a total of 22.66 inches (Table 3 and 4, Figures 3 and 4).

March

The month of March started with a significant winter storm. Detailed [local observations](#) reported more than two feet of snow accumulation March 1-2, with periods of high winds

and low visibility. The storm ended with the passage of a cold front and low temperatures dipped down to a chilly 1°F on March 5. Unfortunately, the National Weather Service no longer manually measures snowfall or snow depth at Yakutat and hence these snow events will not be archived in national climate databases. Automated observations recorded 1.85 inches of precipitation (rain + melted snow) on March 1 and 0.30 inches on March 2. Cold and dry persisted through mid-March with daily highs not even getting above freezing March 13-14. Heavy snow was reported again on March 15. Typical temperatures and precipitation returned March 15-24. Overall, the average monthly temperature for March was 28.5°F compared to a normal value of 31.9°F and precipitation was 75% of normal.

April

Overall, temperatures were near normal in April. The coldest temperature recorded was 20°F on April 3 and the high temperature was 58°F on April 21. Precipitation occurred on 20 days of the month, but no 24-hour totals exceeded 0.50 inches. The monthly total of 4.90 inches was only 62% of normal.

May

Low temperatures in early May were chilly with several days below freezing. By mid-month clear and dry weather in southeast Alaska led to a record-breaking heat wave with high temperatures extending into the northeast gulf coast. The high temperature of 77°F in Yakutat on May 18 crushed the old record of 72°F from 1963. Rain returned the last two weeks of the month. May 25-29 were particularly wet with a total of over five inches recorded. The average monthly temperature was right at normal and precipitation ended up at 135% of normal.

Table 3. Spring 2023 average monthly temperatures compared to the 1991-2020 normal.

Spring 2023	Average Monthly Temp (°F)	1991-2020 Normal (°F)	Departure from Normal (°F)
March	28.5	31.9	-3.4
April	38.0	38.6	-0.6
May	45.6	45.6	0.0

Spring Temperature Departure from normal: -1.3°F

Table 4. Spring 2023 monthly precipitation totals compared to normal.

Spring 2023	Total Monthly Precip. (in.)	1991-2020 Normal (in.)	Departure from Normal (in.)
March	7.17	9.52	-2.35
April	4.90	7.94	-3.04
May	10.59	7.85	2.74

Spring Precipitation Departure from normal: -2.65 in. (90% of normal).

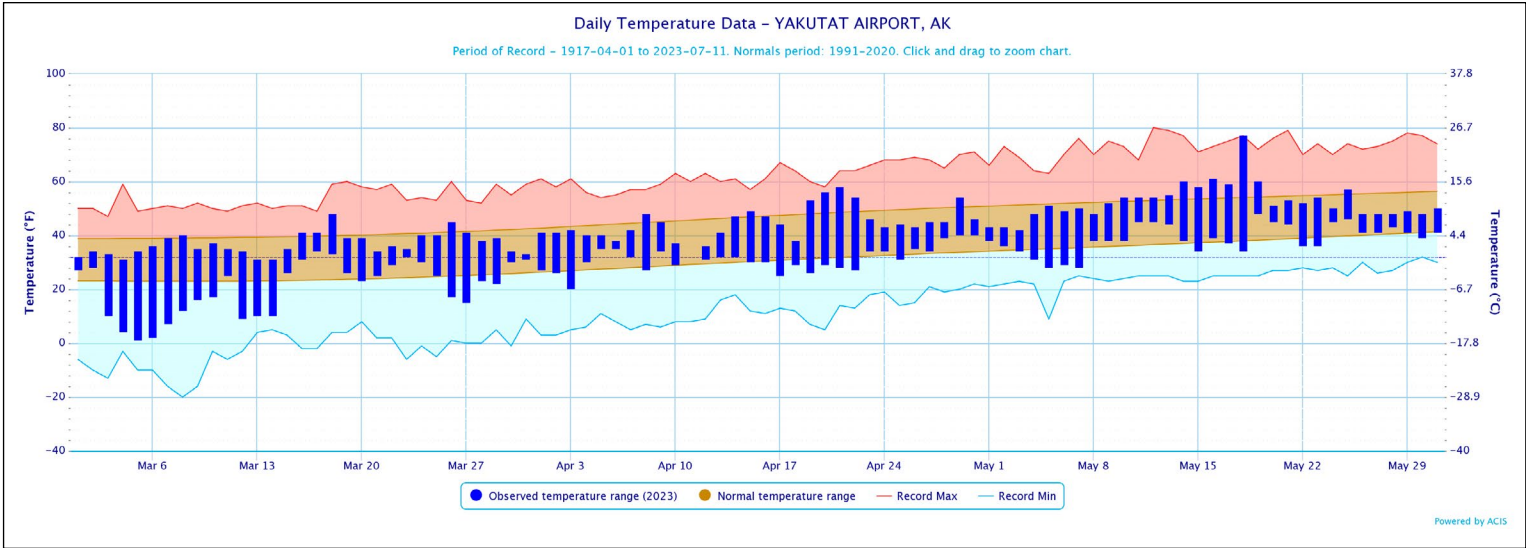


Figure 3. Spring 2023 daily temperatures at Yakutat showing record maximum (red), record minimum (blue), normal (brown) and observed range (blue bars).

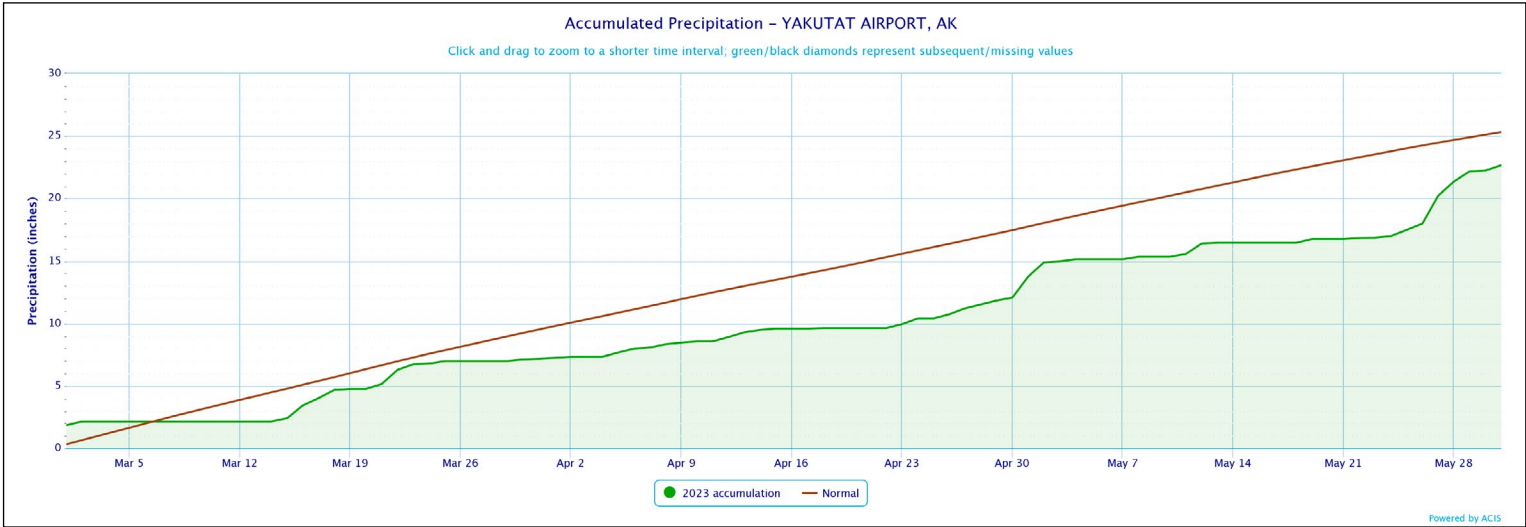


Figure 4. Spring 2023 accumulated precipitation (melted snow and rain) at Yakutat (green) compared to normal (brown line).

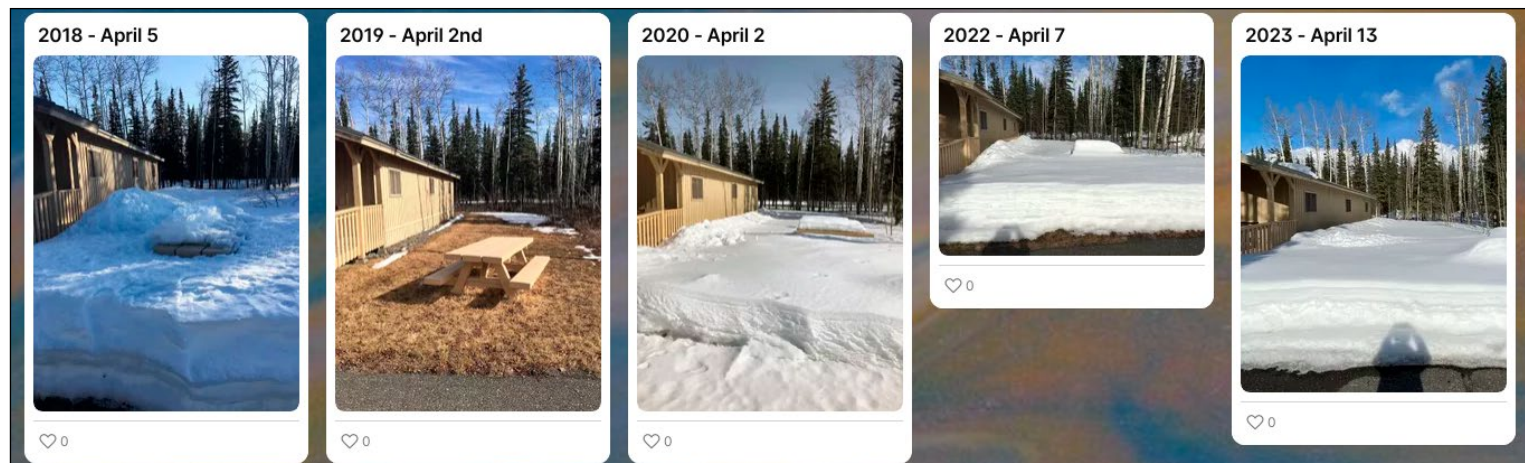


Figure 5. Visualizing the variability in snow depth in early April at park headquarters. Graphic courtesy of Jamie Hart.

Jamie Hart has been adding to our data catalog through an informal repeat photography project that captures the early April snowpack at WRST HQ. It is a fascinating timeline showing the variability that can occur from year to year (Figure 5). April is typically the month when the rapid melt begins as the days get longer and the temperatures rise above freezing. The 2023 photo (far right) was taken about a week later than other years. This year, the combination of a robust snow season and a cooler than normal April meant the snow lingered longer than usual.

Central Alaska Inventory and Monitoring Network Climate Stations

We record weather data at additional sites in Wrangell-St. Elias to help understand daily, monthly, and seasonal weather patterns and shifting climate averages (Figure 6). We track the weather extremes that cause disturbance such as drought, floods, heat waves, cold snaps, and high winds. The data are collected and analyzed along with other park 'vital signs' to provide a holistic view of how these high latitude park lands are changing. Here are a few spring highlights from the May Creek and Chisana Snotel sites and the Chititu climate station.

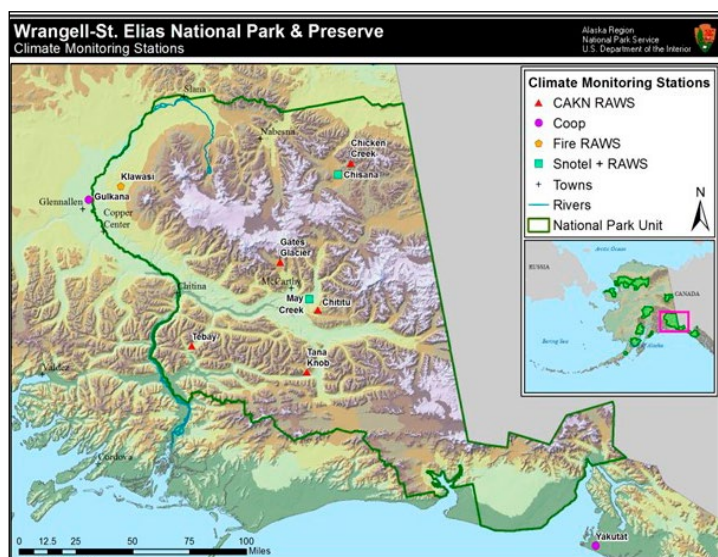


Figure 6. Central Alaska Inventory and Monitoring Network climate stations in Wrangell-St. Elias National Park and Preserve.

May Creek and Chisana Snotel

The snow telemetry or 'Snotel' sites at Chisana and May Creek measure snow, melted snow, and rain 365 days a year. With more than 15 years of data we are learning more about the timing and amount of snow cover, summer rainfall, and annual precipitation amounts at these locations. The 2022-2023 winter season was the wettest to date at both of these sites! We'll call it 'winter' precipitation, but in this case it includes the total precipitation for all of the cold season months from October 1 through April 30. Abundant early season snow was a factor. October 2022, the start of the season was particularly wet (snowy) for the park (Figure 7).

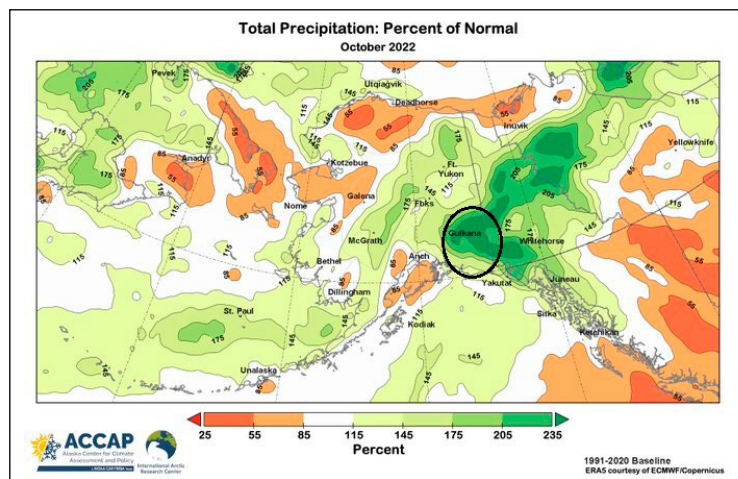


Figure 7. Where did the early season snow fall? This map shows the total monthly precipitation percent of normal (normal being 100%) for October 2022 for Alaska. The dark green areas were the wettest locations, where more than twice as much precipitation (melted snow and rain) fell compared to normal, and the bullseye was Wrangell-St. Elias National Park and Preserve (black circle).

At Chisana, the cumulative winter precipitation total was 7.2 inches, well above the average of 4.0 inches (for Oct 1 - Apr 30) and the highest amount to date. Peak snow occurred on March 10th with 32 inches of snow on the ground. On April 30th there was still 27 inches of snow on the ground; the average snow depth for the end of April at Chisana is 9.5 inches.

May Creek Snotel recorded a total of 12.6 inches of winter precipitation accumulation, the highest to date for this location

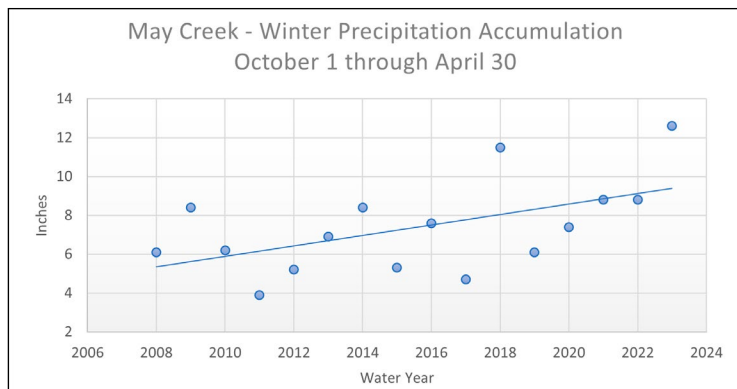


Figure 8. Winter precipitation totals for the May Creek Snotel site in Wrangell-St. Elias, 2008-2023. Winter precipitation totals have increased significantly over the past 16 years. 2023 was the wettest (snowiest) winter to date.

(Figure 8). The average winter accumulation is 6.7 inches. That's 188% of normal! The robust snowpack lasted through the season. In the past three years, with cooler spring temperatures, the snowpack has lingered a bit longer. On April 30 there was still 24 inches of snow on the ground; it is not uncommon for

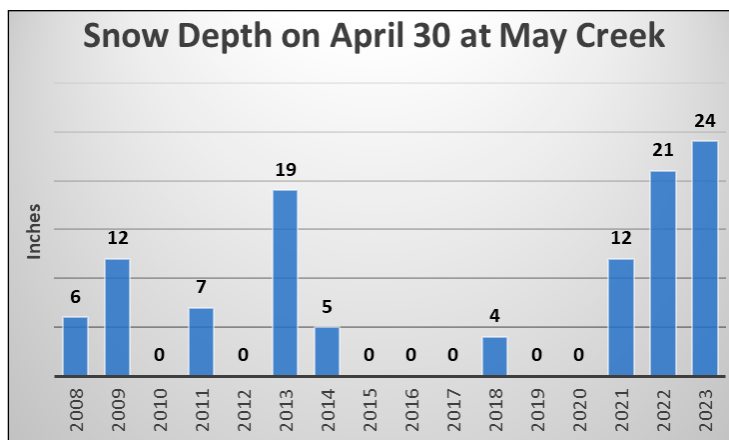


Figure 9. April 30th snow depths at the May Creek Snotel site between 2008 and 2023.

the site to be snow free by the end of April (Figure 9). The melt-out date was May 19, which is about two weeks later than average.

Chititu

We started continuous year-round measurements at the

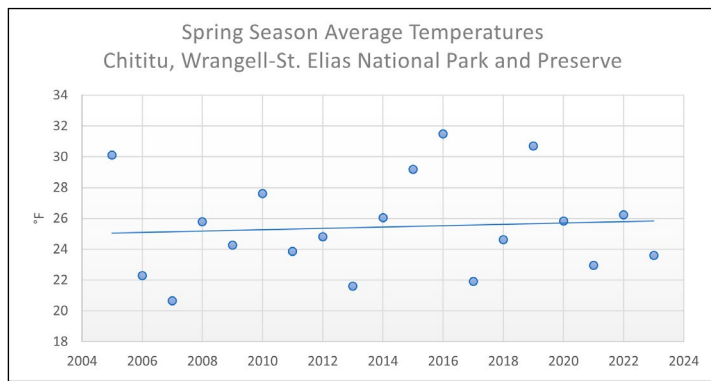


Figure 10. Spring season average temperatures at Chititu 2005-2023. There has been a slight increase in spring temperatures over the past 18 years. 2023 was one of the cooler springs at this site.

Chititu climate station in 2005 and this past spring was one of the cooler springs on record. It was 23.6°F in 2023, the sixth coldest (Figure 10). La Niña conditions persisted for the past three years (2020-2023) bringing overall cooler temperatures to Alaska during the cold season. La Niña ended in late spring and El Niño conditions have now developed with warmer-than-average tropical sea surface temperatures. El Niño is forecast to continue into winter and these conditions typically favor warmer than average temperatures in Alaska.



Physical scientist, Ken Hill, maintaining a climate station in the Central Alaska Network.

More Information

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<https://www.nps.gov/im/cakn/climate.htm>

[Current weather in Wrangell-St. Elias National Park & Preserve](#)

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](#)