



Bering Land Bridge N Pres. • Cape Krusenstern NM
Gates of the Arctic NP & Pres. • Kobuk Valley NP • Noatak N Pres.

Spring 2023

Weather & Climate Summary Gates of the Arctic Spring 2023

Bettles Spring 2023 Weather Summary

Weather observations have been recorded in Bettles since 1951 and this location is used as an index site for climate comparisons in Gates of the Arctic. We'll look at spring conditions in respect to the latest climate normal period, 1991-2020, and highlight data from a few of the Arctic Inventory and Monitoring Network (ARCIN) climate sites for the spring season.

Overall, spring was cooler and wetter than normal. Weather highlights for the season include a snowy March followed by a cold April without any measurable snow or rain. The average temperature for the 2023 spring season was 20.5°F, which is 4.0°F below the 1991-2020 normal. It was the coldest spring since 2013. Spring (melted) snow and rain totaled 2.47 inches, + 0.37 inches above normal. The spring precipitation fell as snow in March and as rain in May (Table 1 and 2, Figures 1 and 2).

March

Temperatures were near normal for March, but precipitation was above normal. The average monthly temperature was just a few tenths shy of normal at 3.7°F. Temperatures were well below normal the first week of the month. The monthly low temperature was -45°F on March 4. This was the lowest temperature of the cold season (tied with February 27). Daily high temperatures were warmer than normal, and near or above freezing March 18-23. The total precipitation (melted snow and rain) was 1.26 inches, well above the normal 0.61 inches.

April

April temperatures were much colder than normal and only a trace of precipitation was recorded for the month. It was the third coldest April on record with a monthly average temperature 13.4°F colder than normal. It was especially cold between April 5 and 11 where the daily temperatures averaged

Arrigetch Peaks, May 19, 2023, Gates of the Arctic National Park and Preserve. NPS/Ken Hill.

28°F colder than normal. New record low temperatures were noted on April 11th and 26th. There was a trace of precipitation logged on April 21, but not enough to measure. Although April is typically the driest month (0.60 inches is normal), it was the first April on record with no measurable precipitation in Bettles.

May

Temperatures warmed in May and the rain started to fall. The average temperature for the month was 46.7°F, 1.7°F above normal. May precipitation totaled 1.21 inches, which is ~136% of normal.

Table 1. Bettles 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	3.5	3.7	-0.2
April	11.2	24.6	-13.4
May	46.7	45.0	+1.7

Spring Temperature Departure from normal: -4.0°F

Table 2. Bettles spring 2023 monthly precipitation totals compared to normal

Spring 2023	Total Monthly Precip. (in.)	1991-2020 Normal (in.)	Departure from Normal (in.)
March	1.26	0.61	+0.65
April	Trace	0.60	-0.60
May	1.21	0.89	+0.32

Spring Precipitation Departure from normal: +0.37 in. (118% of normal).

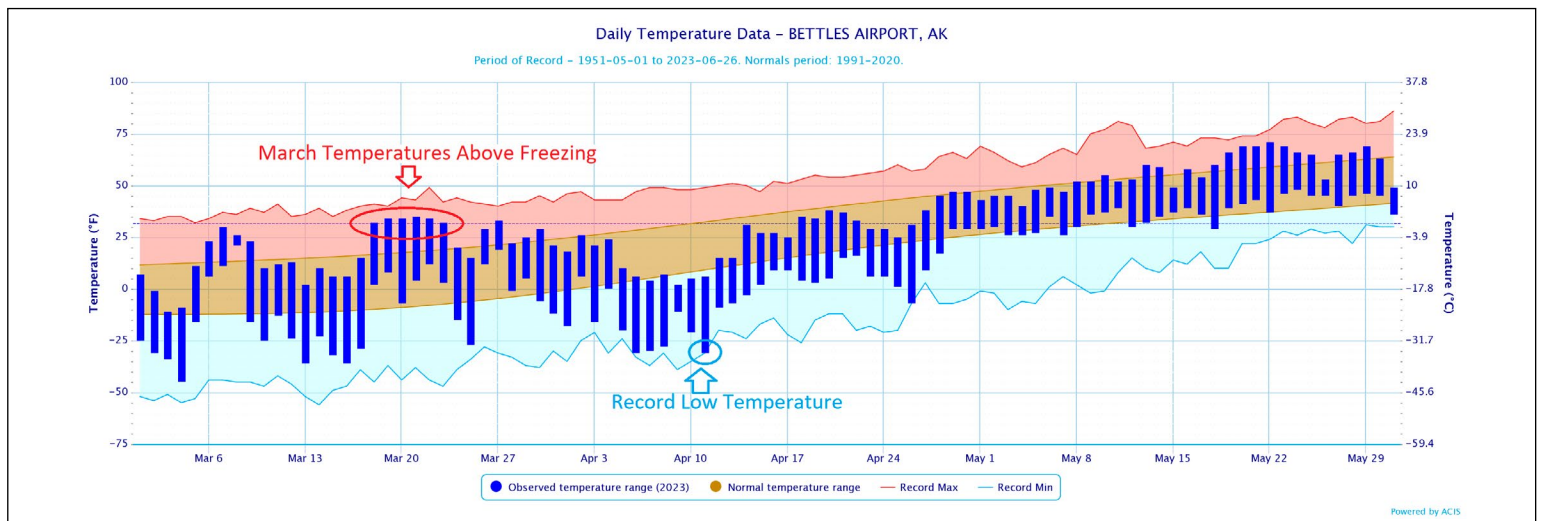


Figure 1. Spring 2023 daily temperatures at Bettles showing record maximum (red), record minimum (blue), normal (brown) and observed range (blue bars). Data from: <http://xmacis.rcc-acis.org/>.

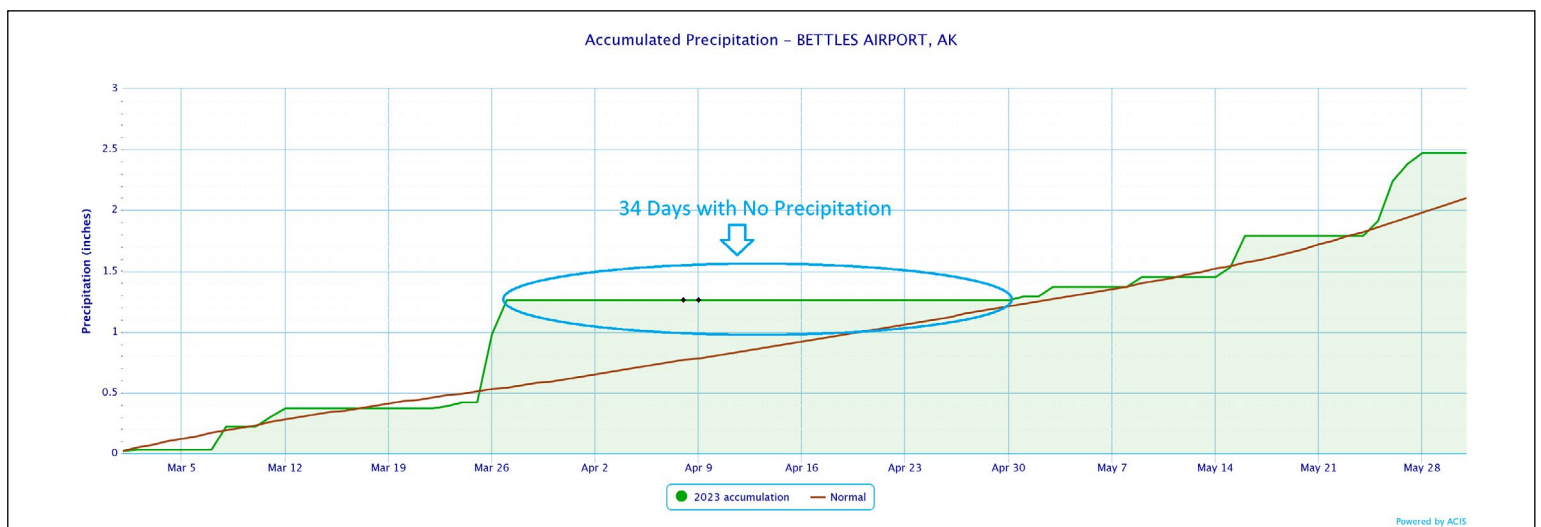


Figure 2. Spring 2023 accumulated precipitation at Bettles (green) compared to normal (brown line). Data from: <http://xmacis.rcc-acis.org/>.

Snowfall Total Just Below Normal

The seasonal snowfall total in Bettles was 92 inches, six inches less than the normal 98 inches. November, February and March were snowier than normal this season, while December had half the normal amount of snow. The melt-out date at the Bettles site was May 15, just a few days later than average.

Cold April Statewide

Temperatures were below normal across most of Alaska in April with the coldest temperature departures in the central Interior climate division which includes Bettles (the darkest blue area in Figure 3). According to the [Alaska and Arctic Climate Newsletter](#) the area north and northwest of Bettles ranked as the coldest April in the past 50 years.

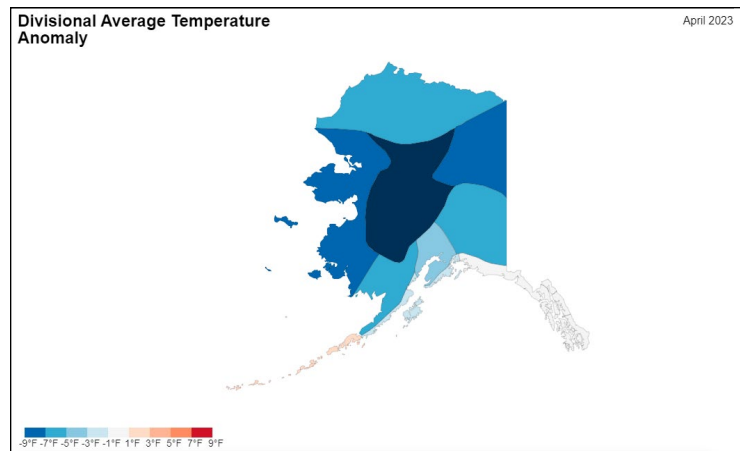


Figure 3. Alaska temperature anomalies for April 2023. All the climate divisions in the state, except the Aleutians, were colder than the 1991-2020 normal. Graphic from: [NOAA Climate at a Glance](#).

Spring of 2023 compared to 2013

This spring brought back memories from ten years ago. 2013 was notable for cold late spring temperatures and a delayed melt season, a harsh combination that negatively impacted caribou and Dall's sheep populations. Both 2023 and 2013 had average April temperatures that were 13°F colder than normal. This April had a more robust snowpack at the start of the month with 35 inches on the ground compared to the 23 inches in 2013. Both years had colder than normal temperatures the second week of April. In 2013 those colder than normal temperatures persisted until the third week of May; this year they moderated in late April. Another difference is that this year there was no additional precipitation in April, in 2013 an additional six inches of snow fell in April. With colder temperatures lingering through May the snowpack in 2013 held on and melt-out was about a week later than normal. This year temperatures warmed enough in late April to initiate the onset of rapid melt and Bettles was snow free by May 15, close to average. Figure 4 shows the late spring daily temperature and snow depth values for 2023 (orange lines) and 2013 (blue lines).

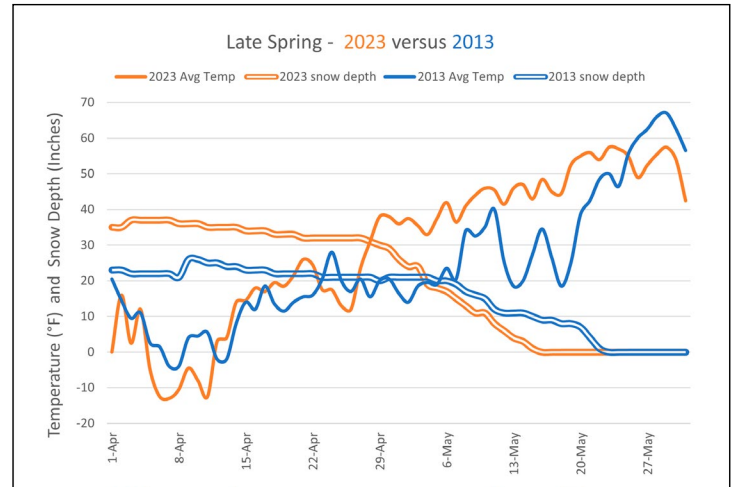


Figure 4. Daily average temperatures and snow depth at Bettles in 2023 (orange) and 2013 (blue).

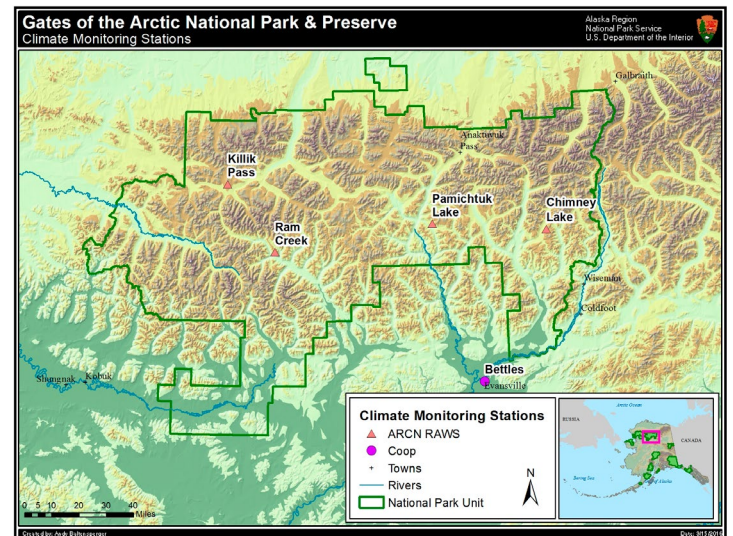


Figure 5. Arctic Inventory and Monitoring Network climate stations in WEAR.

Arctic Inventory and Monitoring Network Climate Stations

We monitor weather and climate in Gates of the Arctic National Park and Preserve to help understand daily, monthly, and seasonal weather patterns and shifting climate averages (Figure 5). 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 high latitude national park lands are changing. Here are a few spring highlights from the Dahl Creek Snotel and Ram Creek sites:

Dahl Creek Snotel

A new snow telemetry or 'Snotel' site was installed last August west of Gates of the Arctic at Dahl Creek near the community of Kobuk. This new site will tell us more about the timing

and amount of snow cover, summer rainfall, and annual precipitation amounts for an area of Alaska with very few weather stations, and none, until now, that measure snow and rain year-round. Although we did anticipate that this site would have more snow than Bettles (since it is closer to the coast), the first winter of data revealed a much deeper than expected snowpack (Figure 6 and 7). Peak snow for the 2022-2023 season occurred on March 27 with 65 inches of snow on the ground. As of June 1, a total of 14.8 inches of precipitation had fallen at the site since the start of the water year on October 1.



Figure 6. Dahl Creek snow depth on April 10, 2023, just a few weeks after peak snow. NPS photo by Matt Cameron.

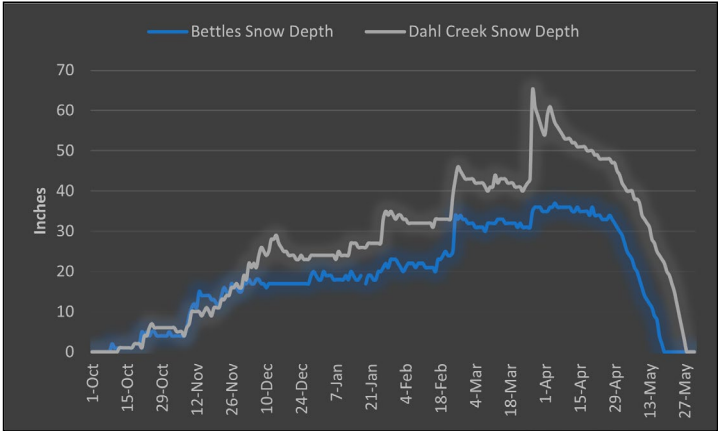


Figure 7. Daily snow depth at Dahl Creek (grey) and Bettles (blue) 2022-2023.

Ram Creek Climate Station

The Ram Creek climate station sits on a ridge high above the Alatna River in the Brooks Range (Figure 8). April 2023 was the coldest April on record to date. The average monthly temperature was 6.1°F, nine degrees cooler than the 11-year average (Figure 9). When we started monitoring at this location the April monthly temperatures were warming at an

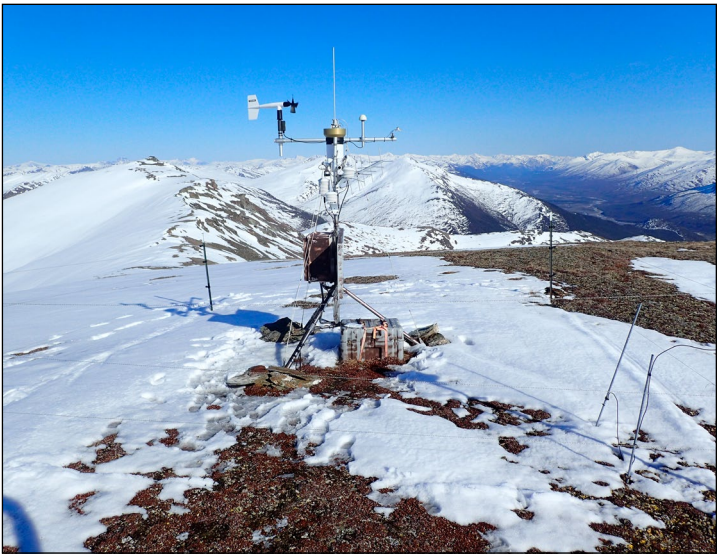


Figure 8. Ram Creek climate station in Gates of the Arctic, May 19, 2023. NPS photo by Ken Hill.

alarming rate, since then temperatures have moderated. La Niña conditions persisted for three years from 2020-2023. This tropical ocean pattern brought a reprieve of cooler temperatures to Alaska. That has come to an end. El Niño conditions have 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 western Alaska.

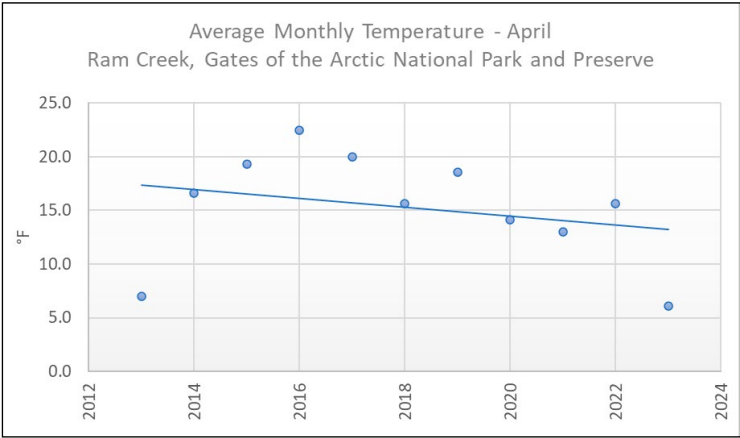


Figure 9. Average April temperatures at the Ram Creek climate station in Gates of the Arctic National Park and Preserve 2013-2023.

More Information

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<https://www.nps.gov/im/arcn/climate.htm>
[Latest weather conditions in the Western Arctic Parklands](#)
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](#)