



Weather & Climate Summary Yukon-Charley Rivers National Preserve Spring 2023

Eagle Spring 2023 Weather Summary

Consistent weather observations have been recorded at the National Weather Service site in Eagle, Alaska since 1975. We'll look at spring conditions (March, April, May) compared 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 and snowy April and a later than normal ice break up on the Yukon River. The average temperature for the 2023 spring season was 26.6°F, which is 1.4°F below the 1991-2020 normal. Spring precipitation totals were above normal, with abundant snowfall in April (Table 1 and 2, Figures 1 and 2).

March

March temperatures were warmer than normal, while the monthly precipitation total was just below normal. The average monthly temperature was +1.5°F warmer than normal, with the warmest temperatures of the month occurring during the third week. The daily high temperatures were well above normal March 20-25. March 2023 snowfall total was 4.9 inches, 82% of normal. The total precipitation (melted snow and rain) for the month was 0.32 inches, normal is 0.39 inches.

April

The average temperature for April was 22°F which is 7.5°F colder than normal. It was the coldest April since 2013. It was especially cold between April 23 -25 where the daily temperatures averaged about 26°F colder than normal. Total precipitation was well above normal. A total of 14 inches of snow fell in April, with a liquid water content of 0.95 inches. Normal for April is 3.6 inches of snow with 0.34 inches of water

Kandik River public use cabin surrounded by ice on May 15, 2023. Yukon River spring breakup 2023. NPS Photo/Nick Thompson

equivalent. There was still 25 inches of snow on the ground on April 30th, which is the average date of melt-out in Eagle.

May

May was warmer and wetter than normal. Temperatures rebounded after the April chill and ended up 1.9°F above normal at 49.0°F. It seemed like summer was on the way when the temperature reached a high of 76°F on May 26th, but the last few days of May brought cooler temperatures. Most of the precipitation fell in the latter half of the month. May 27th was particularly wet with 0.76 inches of rain falling in a 24-hour period. May precipitation totaled 1.65 inches, which is 156% 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	8.7	7.2	+1.5
April	22.0	29.5	-7.5
May	49.0	47.1	+1.9

Spring Temperature Departure from normal: -1.4°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	0.32	0.39	-0.07
April	0.95	0.34	+0.61
May	1.65	1.06	+0.59

Spring Precipitation Departure from normal: +1.13 in. (163% of normal).

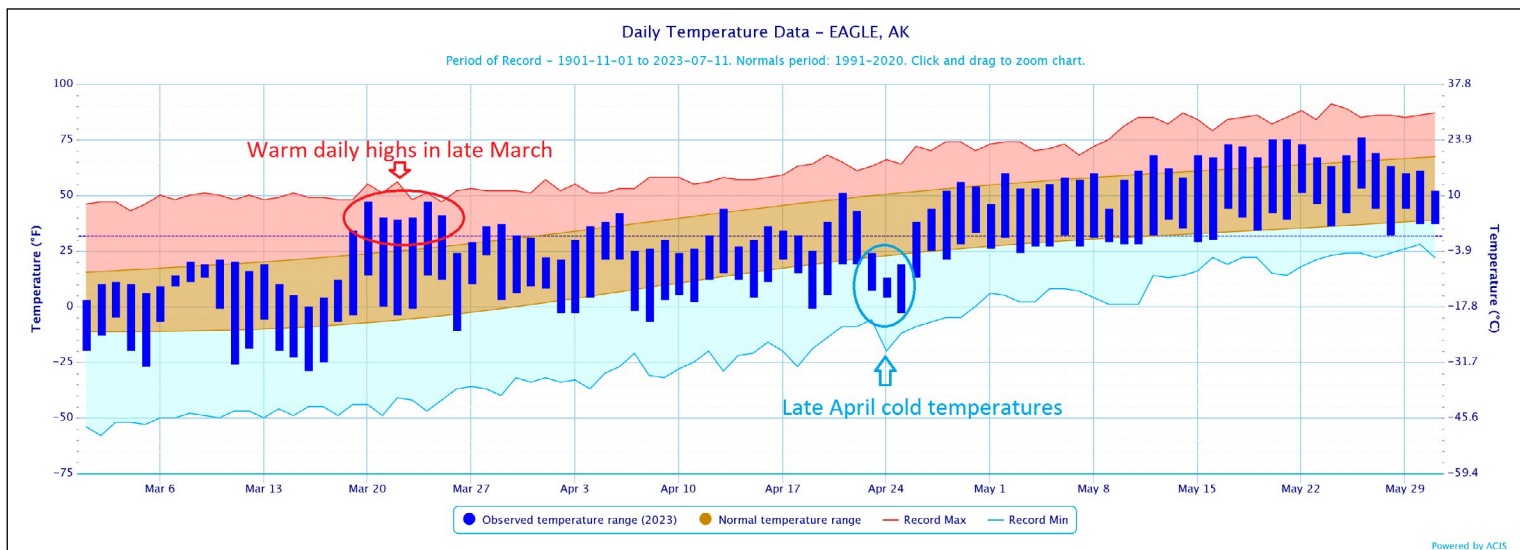


Figure 1. Spring 2023 daily temperatures at Eagle showing record maximum (red), record minimum (blue), normal (brown) and observed range (blue bars).

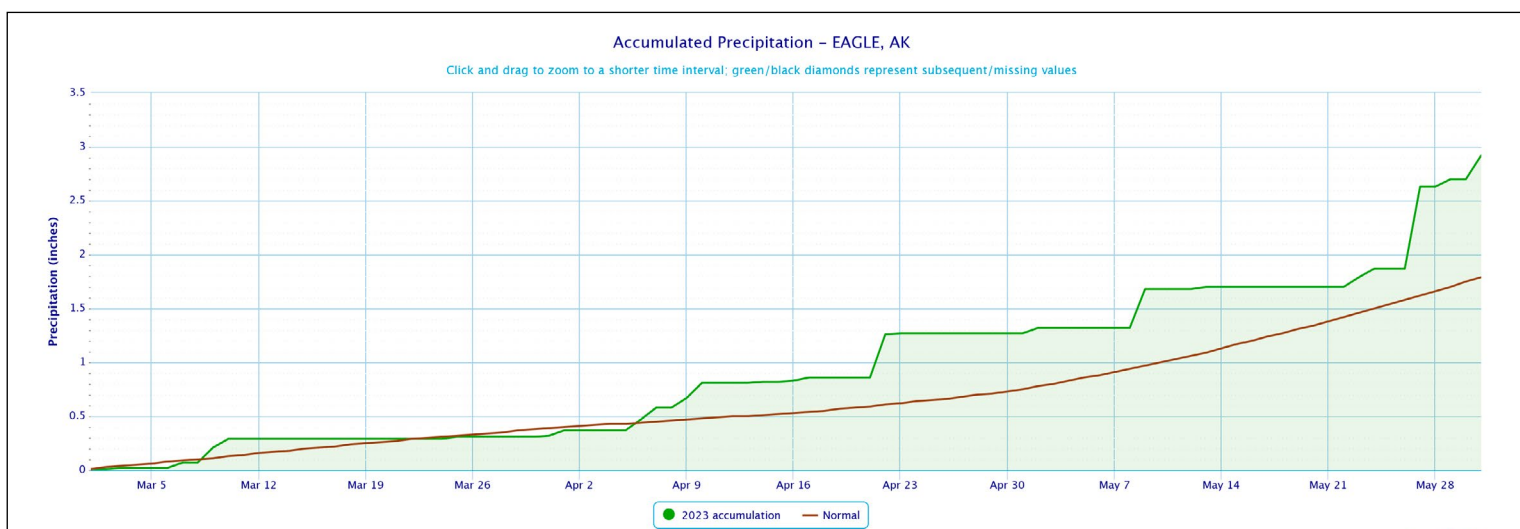


Figure 2. Spring 2023 accumulated precipitation (melted snow and rain) at Eagle (green) compared to normal (brown line).

Snow Season 2022-2023

The cumulative snowfall total at Eagle for the 2022-2023 snow season was 83 inches, 134% of normal. This season ranked as 6th snowiest since 1975. The season had a slow start with below normal snowfall for October and November. That changed as the winter progressed. All of the winter months were snowier than normal. January had the most snow compared to normal, with a total of 27.7 inches versus 9.4 inches. The melt-out date (snow free date) for Eagle was May 15, about two weeks later than normal.

Yukon River Breakup

The Yukon River breakup at Eagle for 2023 was on May 12 (Figure 3). Breakup dates have been trending earlier since 1980; the median breakup date for that period is May 4. This year was the latest break up since 2013. Cool late springs often lead to a dynamic ice breakup. The ice remains hard, ice jams can form, and ice starts to move when pushed by ice from upstream. A thermal breakup is where the ice melts in place. This year, the ice moved past Eagle with minimal impact, but a

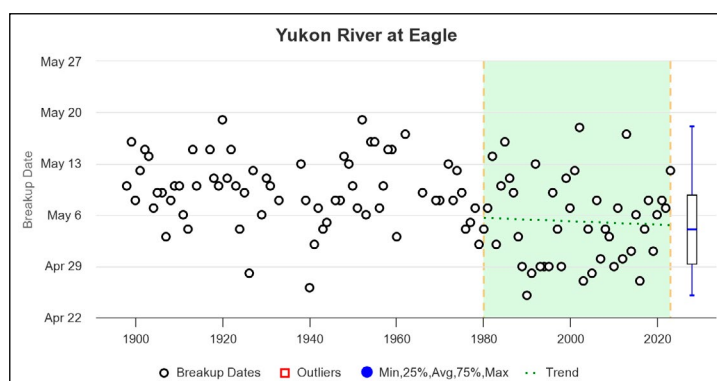


Figure 3. Breakup dates on the Yukon River at Eagle. Since 1980 (green shaded area) the trend (dotted line) has been towards earlier breakups.

serious ice jam occurred downstream at Circle causing major damage to the community. Several cabins along the Yukon River in Yukon-Charley Rivers National Preserve sustained damage from large chunks of river ice that got lodged on the banks and surrounded the cabins. The University of Alaska Fresh Eyes on Ice program monitors river conditions with

cameras and documents river ice conditions each spring. Check out the timelapse images of the [Break-up of the Yukon River at Eagle, AK in 2023](#). The [Alaska-Pacific River Forecast Center](#) provides a breakup forecast in early spring and daily updates to communities that may be affected throughout the breakup season.

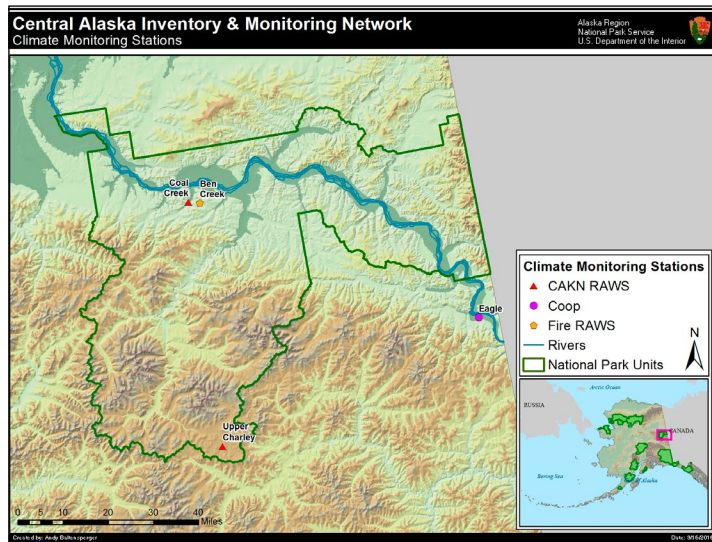


Figure 4. Central Alaska Inventory and Monitoring Network climate stations in Yukon-Charley Rivers National Preserve.

Central Alaska Inventory and Monitoring Network Climate Stations

We record weather data at additional sites in Yukon-Charley Rivers National Preserve to help understand daily, monthly, and seasonal weather patterns and shifting climate averages (Figure 4). 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 highlights from the Upper Charley and Coal Creek sites:

Upper Charley

We started continuous year-round measurements at the Upper Charley station in 2006 and this past April was one of the coolest on record. The average temperature for April was 17.1°F, the second coldest behind 2013 (10.5°F) (Figure 5). La

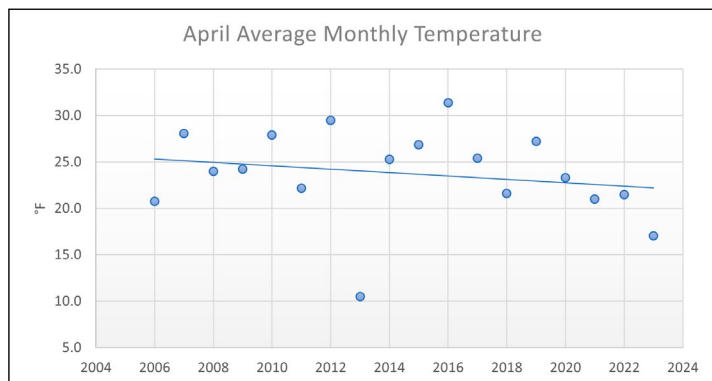


Figure 5. Average April temperatures at the Upper Charley climate station in Yukon-Charley Rivers National Preserve.

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.

Coal Creek Soil Temperature

Soil temperature data from the Coal Creek climate station were used in a recent [publication](#) that examined the cascading effects of warming soil and wildfires on lake catchment characteristics as well as terrestrial and aquatic vegetation and lake water chemistry. The average annual ground temperatures at Coal Creek warmed significantly from about -2°C (28.4°F) to about -1°C (30.2°F) over the 20-year monitoring period. Warming of similar or greater magnitude is inferred at the lake study site due to fire effects (Figure 6). The results indicated that the implications of a warming climate and thawing permafrost may have a greater impact on lakes than originally thought.



Figure 6. Park scientists documented dramatic changes in this lake in Yukon-Charley Rivers over a twenty year period. NPS Photo by Danielle Knapp.



Spring snow survey in Yukon-Charley Rivers. Thanks to Nick Thompson for flying the surveys and capturing this photo of the aerial snow marker (next to the yellow arrow).

More Information

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<https://www.nps.gov/im/cakn/climate.htm>
[Current weather in Yukon-Charley Rivers](#)

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](#)