

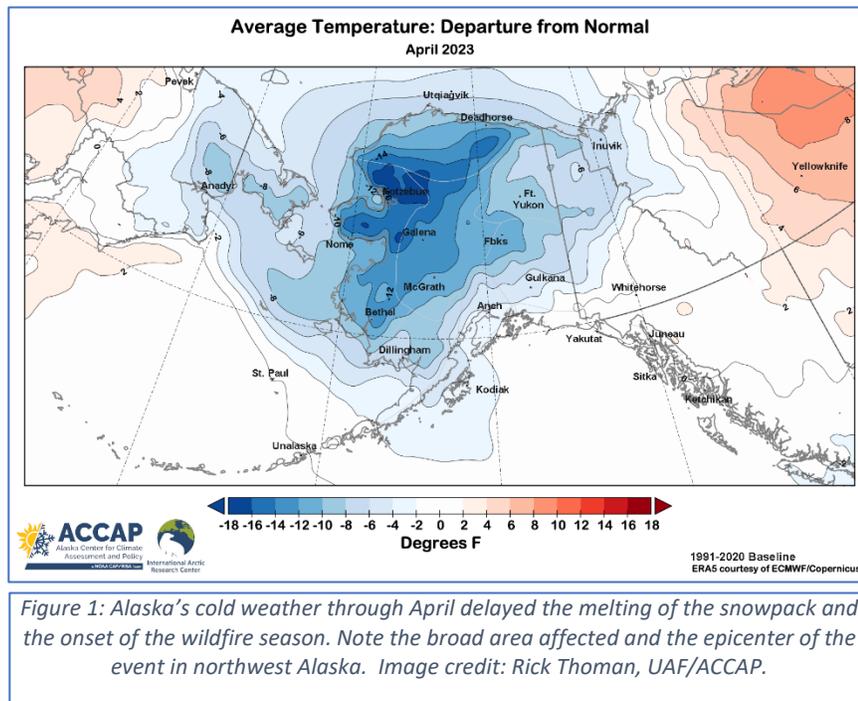
Summary of the 2023 Fire Weather Season in Alaska

Overview: A Tale of Two Seasons

It was the dullest of times, it was the craziest of times. In a nearly exact inversion of Alaska's wildfire behavior in 2022, the 2023 season was remarkably quiet until late July, with less than 2,000 acres burned statewide through the morning of July 24th and then significantly active from late July through August to bring the total acres burned to just shy of 300,000 acres.

Season One: Snowmelt Until the Morning of Monday, July 24

Again, in stark contrast to the 2022 wildfire season, the 2023 season began quietly. An extended cold snap over much of Alaska in April delayed the melting of the snowpack and thus also delayed the beginning of the wildfire season. Figure 1 below shows broad footprint and magnitude of the cold event. By the end of April just 1.6 acres had been burned statewide and much snow remained, especially over higher terrain.



The cold weather gave way to more seasonable temperatures in May, as per Figure 2, and the snowpack eventually gave way even at elevation. Still, given the late melting of the snowpack,

the absence of serious heat despite the return to more normal temperatures, as well as an absence of dry weather (Figure 3), the burnability of the sub-surface fuels was still very low at the end of May, as seen in Figure 4. Figure 4 also illustrates the hit-or-miss nature of convective precipitation, with some areas of the Interior and Southwest Alaska receiving much more rain than other parts of the state.

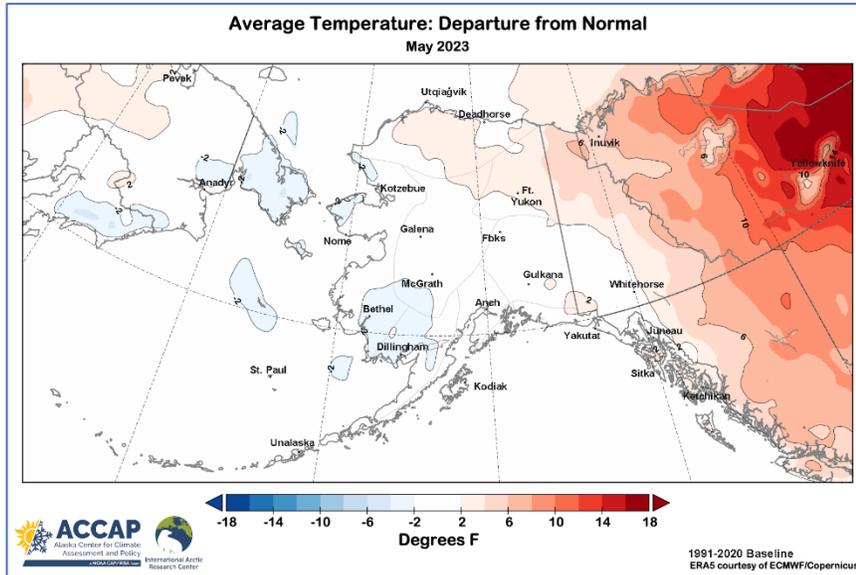


Figure 2: After a cold April, temperatures were very close to normal Statewide in May. Image Credit: Rick Thoman, UAF/ACCAP.

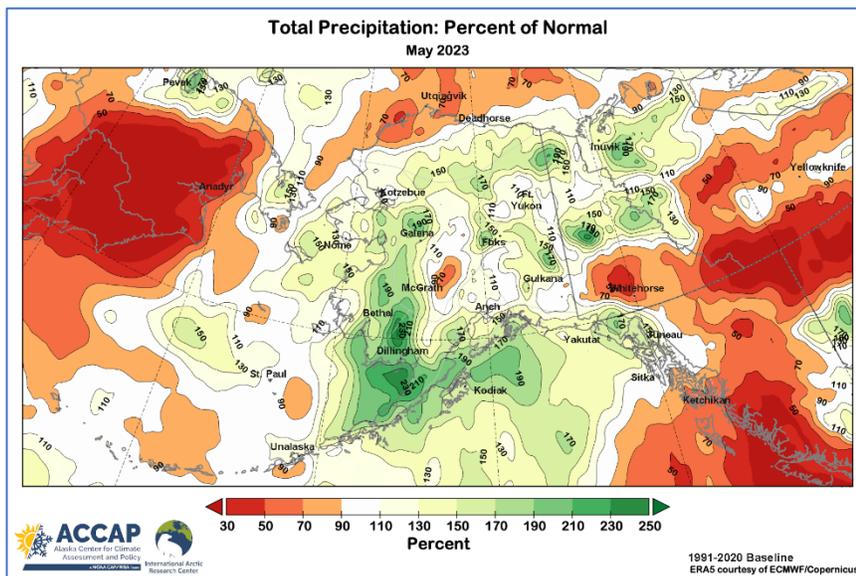


Figure 3: Most of Alaska received normal or even above-normal rainfall in May. Image Credit: Rick Thoman, UAF/ACCAP.

Given the combination of normal temperatures areas of comparatively high rainfall in May, and the late start to the season facilitated by the cold weather in April, serious wildfire activity

remained absent in May, with only 397.5 acres burned by the end of the month. Figure 4 shows the very low values of the Buildup Index (BUI) across Alaska at the end of the month.

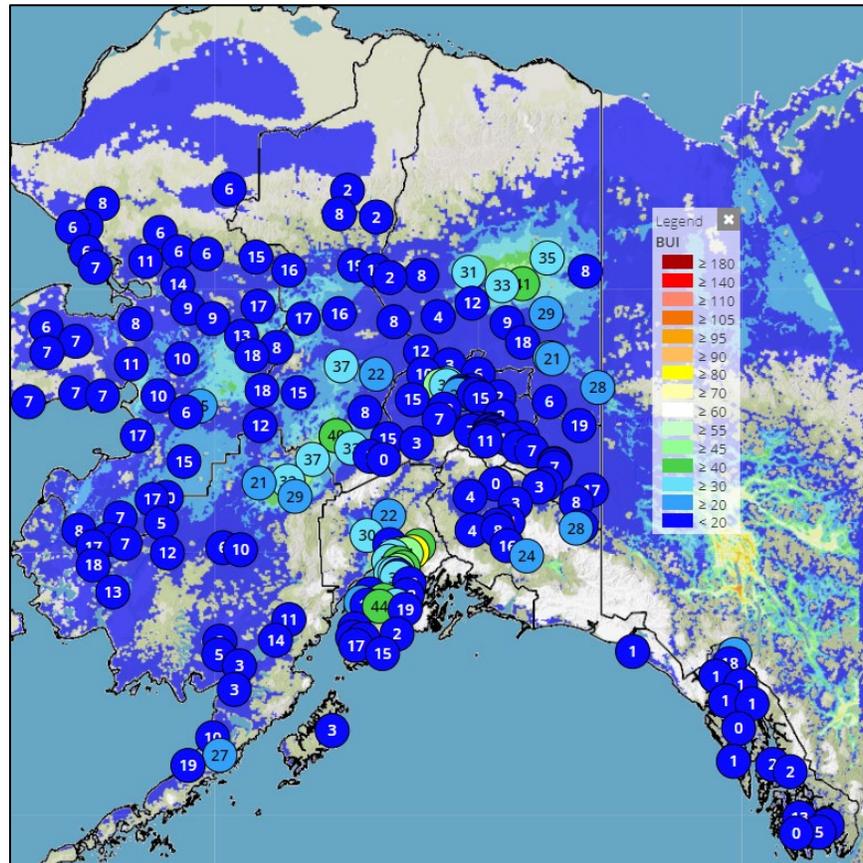


Figure 4: Values of the Buildup Index across Alaska on May 31st.

As evident in Figure 5, temperatures in June were somewhat cooler than normal across the Interior, South Central, and Southwest Alaska, with the North Slope, Alcan border region, and the Panhandle having warmer weather. The consequence of the cooler conditions over mainland Alaska was to further delay the seasonal warming and drying of the subsurface duff layer in many areas.

June's precipitation (Figure 6) was heaviest along the Brooks Range, over northwestern Alaska, and over South Central, while the southeastern Interior and the Copper River Basin were quite dry. This trend for drier conditions over the southeastern Interior did not lead to a serious uptick in wildfire behavior, and even a respectable bout of lightning on June 24th failed to yield enough new starts to present a problem for Initial Attack. By month's end the total area burned across Alaska had only reached 1,331 acres.

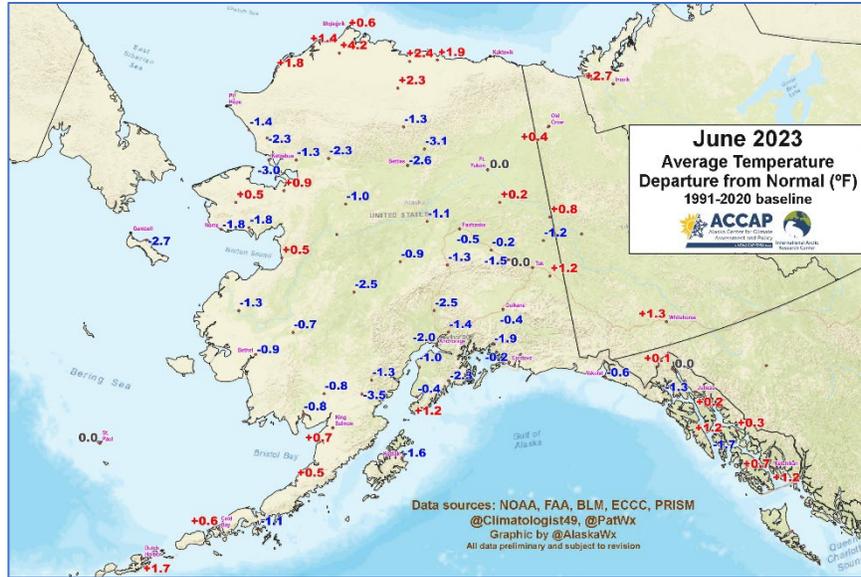


Figure 5: Departure from normal at selected weather observing sites in June. Most noteworthy is the trend for cooler temperatures across much of the Interior, South Central, and Southwest Alaska. Image credit: Rick Thoman, UAF/ACCAP.

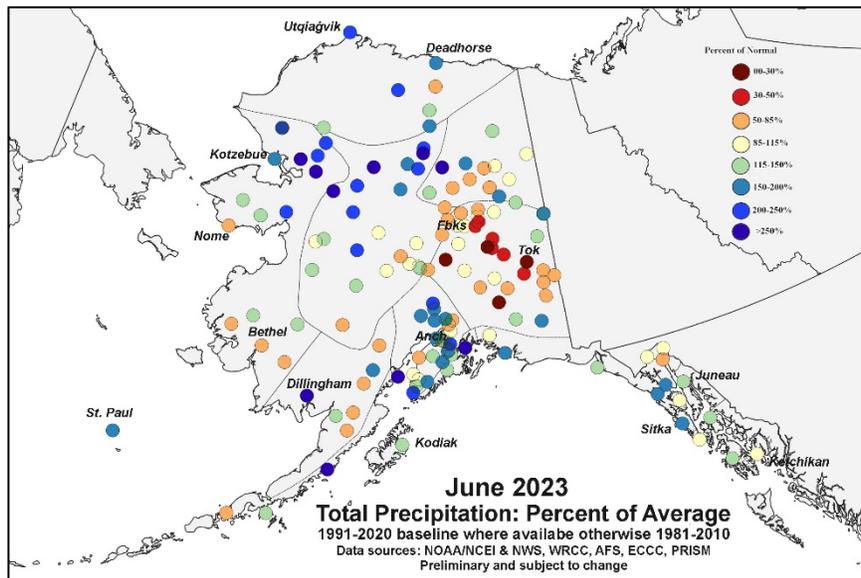


Figure 6: June precipitation departure from normal. Credit: Rick Thoman, UAF/ACCAP.

Figure 7 shows that values of the Buildup Index remained quite low over much of Alaska on June 30, with only isolated pockets of more serious values confined to the lower elevations of the Upper Yukon Valley, the Tanana Valley, and the Copper River Basin. While the weather and fuels did not contribute to meaningful wildfire behavior in June, the trend for drier weather over parts of the State were beginning to set the stage for the season’s comeback at the end of July.

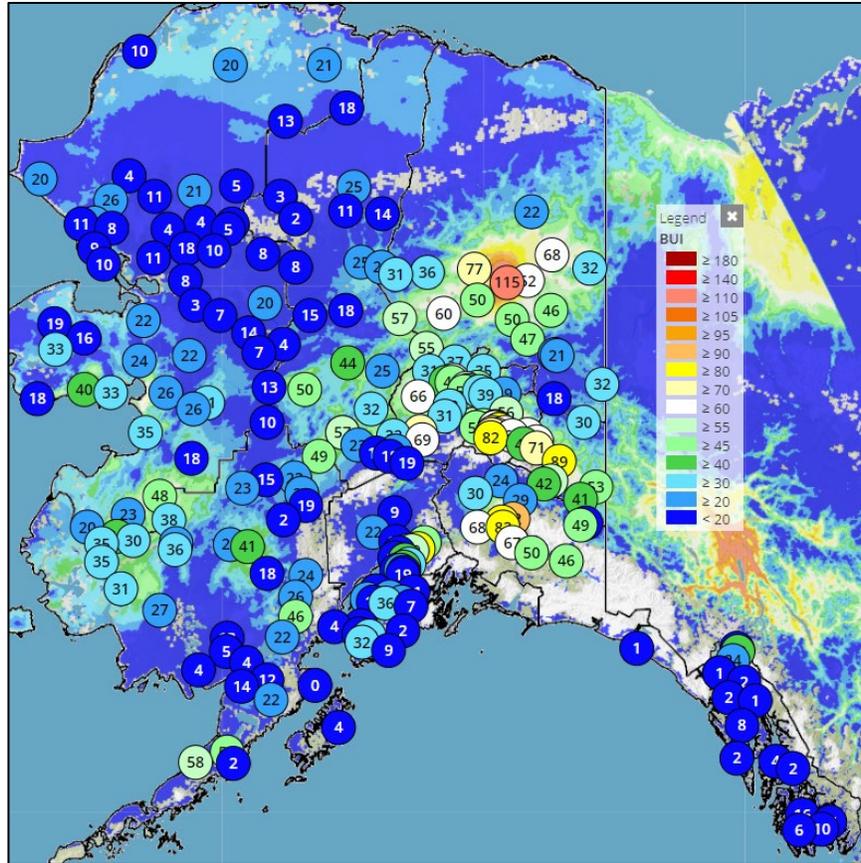


Figure 7: Values of the Build-up Index across Alaska on June 30.

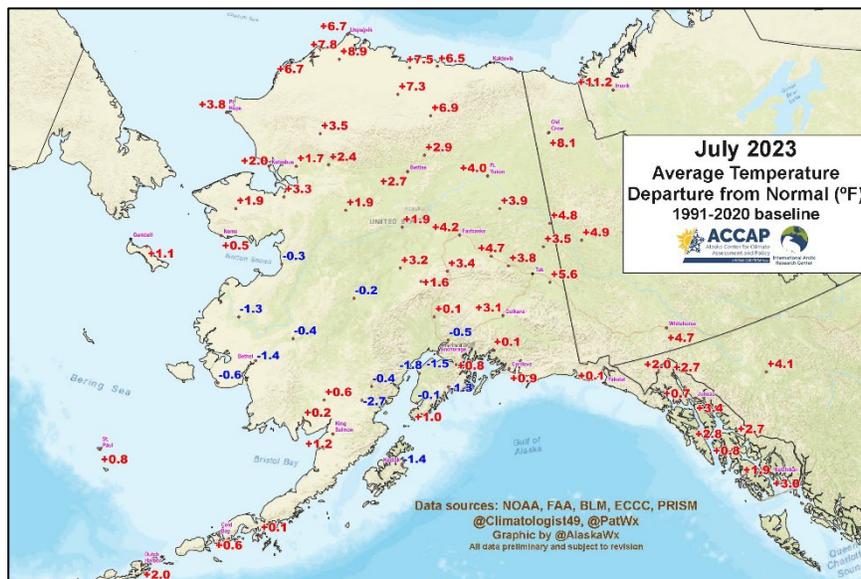


Figure 8: Warming trend for much of Alaska in July. The most significant departures from normal occurred over the central and eastern Interior. Image credit, Rick Thoman, UAF/ACCAP.

July's weather was comparatively warm for much of Alaska, and conditions were rather dry for the eastern Interior, Copper River Basin, and the Panhandle as well. The warm anomaly is significant, as it covered almost all of Alaska except for the Lower Yukon Valley and South Central, and the magnitude of the warm anomaly was quite high over much of northern Alaska and the central and eastern Interior. The combination of warm temperatures and low

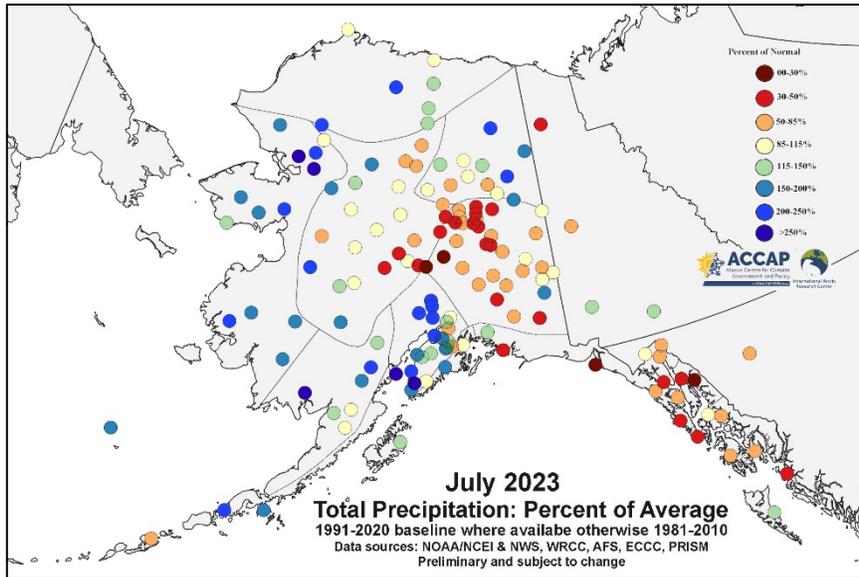


Figure 9: Percent of average precipitation in July indicating drier conditions for much of the Interior and the Panhandle. Image credit: Rick Thoman, UAF/ACCAP.

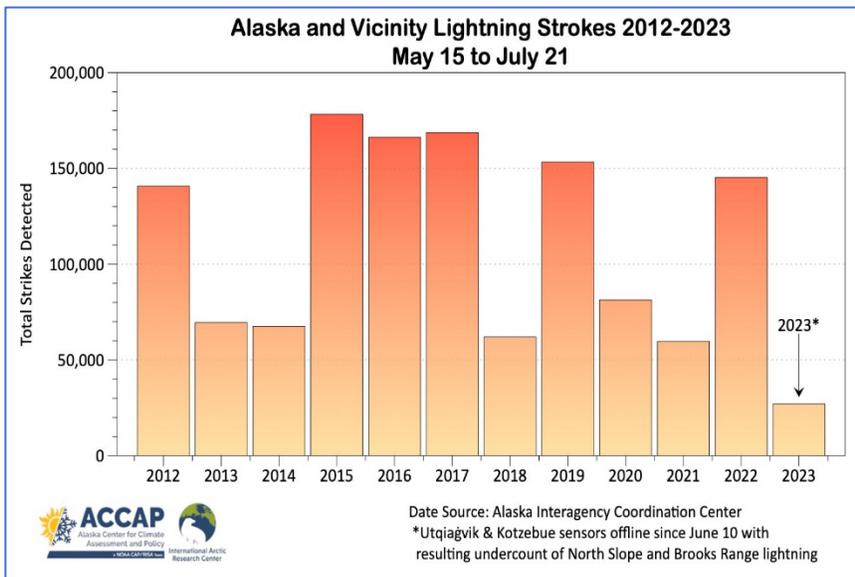


Figure 10: Low lightning activity in 2023 through July 21st. Image credit: Rick Thoman, UAF/ACCAP.

precipitation over the Interior further readied the deeper fuels for the more serious wildfire conditions that were to break out during the last week of the month.

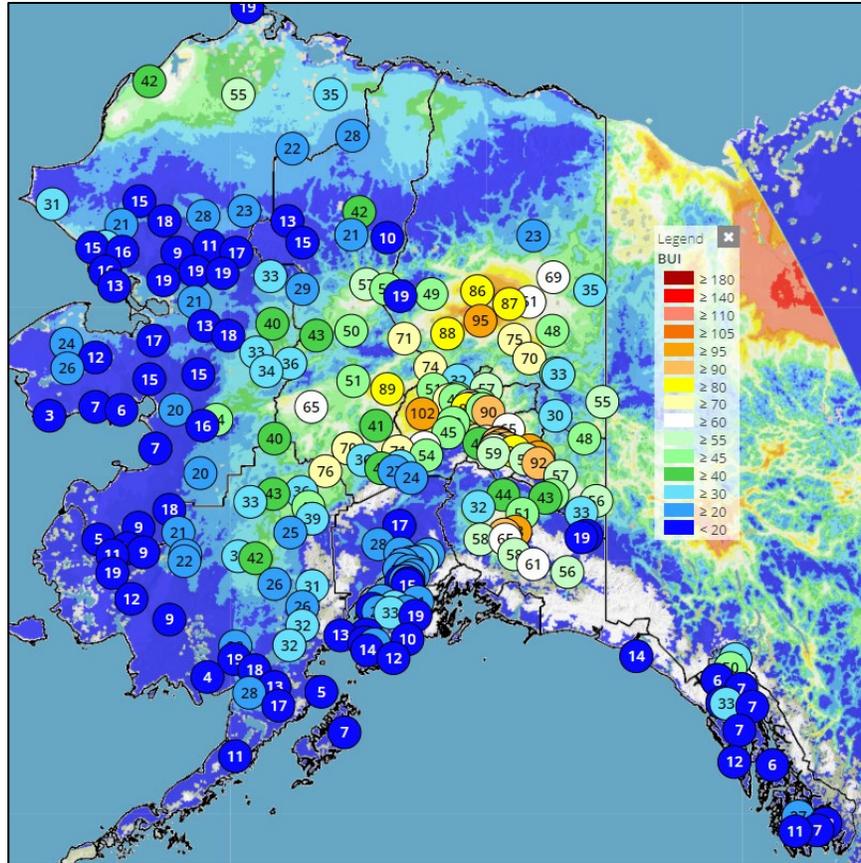


Figure 11: Build-up Index on July 24th. Values are not remarkable by historic standards, but the Interior had become much more burnable compared to earlier in the season.

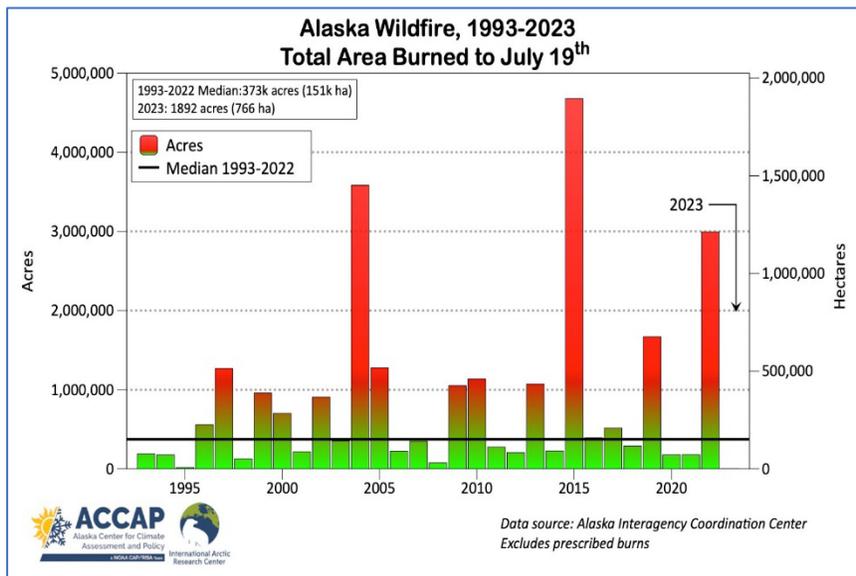


Figure 12: Failure to Launch. As of July 19th, total area burned was still negligible. Image credit: Rick Thoman, UAF/ACCAP.

The comparatively meager amount of lightning in Alaska from May through mid-July, seen in Figure 10, also contributed to the low number of acres burned. As of the morning of Monday,

July 24, the seasonal area burned remained at an all-time low of 1,892 acres. Per Figure 12, as of July 19th, the area burned across Alaska in 2023 is barely detectable compared to the tallies reached in each season of the previous 30 years.

Season Two: July 24th Through the End of the Season

And then came Monday morning, July 24th. Long-term weather records show that thunderstorms are most common over the Interior from late May through early July. But the single biggest day of lightning strikes in Alaska's 2023 season was from 6:00 am July 24th through 6:00 am July 25th with just over 20,000 strikes detected Statewide and in the Yukon. Given that recent weather over the Interior had been warm and dry, this outbreak of lightning was sufficient to start numerous new wildfires.

By late July many personnel had been detailed to assist with ongoing fires in the Lower 48 and with the unprecedented wildfire calamity rampaging in western Canada. Thus, several wildfires started by the lightning event in Alaska were not dealt with quickly and subsequently grew to become problematic.

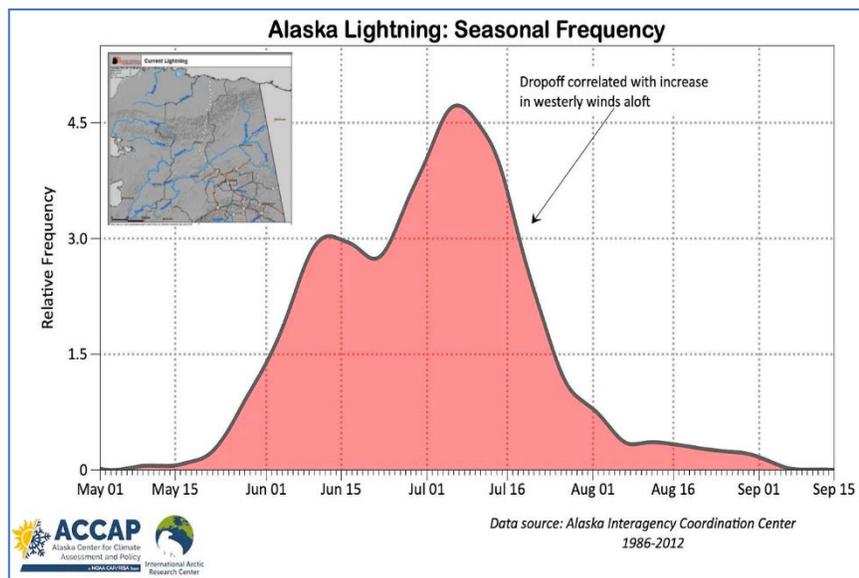


Figure 13: Likelihood of lightning in the Interior through the fire season. Late July typically sees a marked decrease in thunderstorm activity, but late July and early August of 2023 proved to be unusually active. Image credit: Rick Thoman, UAF/ACCAP.

The widespread lightning, occurring over areas where fuels were now dry and warm enough to receive lightning and allow for new starts, triggered the initiation of the biggest wildfires that crews would be dealing with for the remainder of the season, including The Anderson Complex, Lost Horse Creek Fire, McCoy Creek Fire, and the Pogo Mine Road Fire. These problem fires

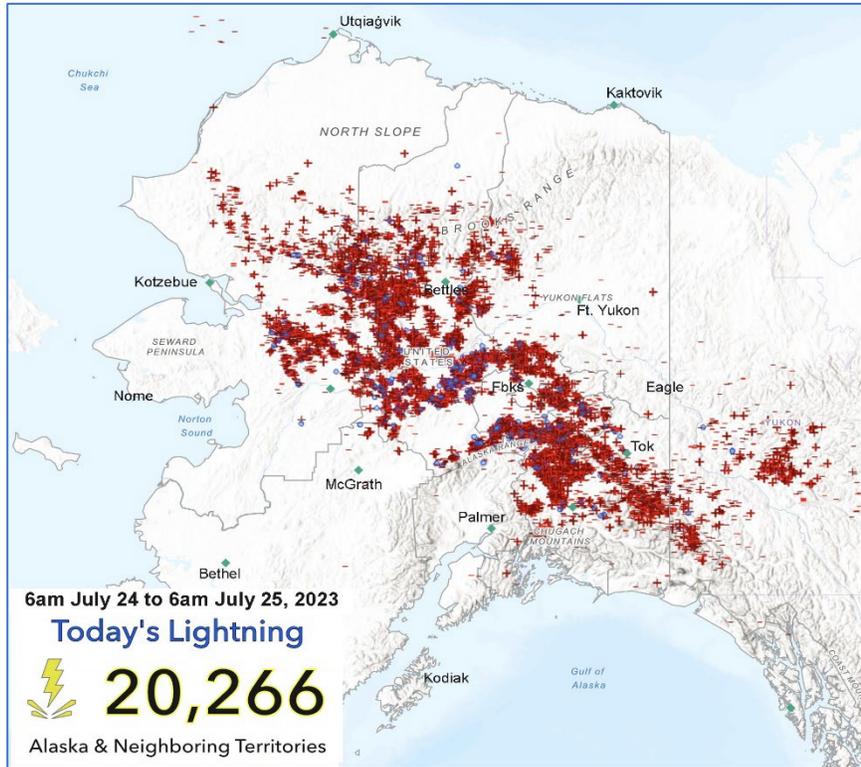


Figure 14: The great lightning event of July 24-25th. Less extreme lightning activity continued for several days after this outbreak. Image credit: Rick Thoman, UAF/ACCAP.

were all on state land in the southern Interior, generally in the Middle Tanana Valley, where fuels were driest along with a significant population base.

Numerous Red Flag Warnings were issued in late July and early August due to continuing bouts of prominent lightning overlapping burnable fuels as well as Chinook wind events through the Alaska Range passes. Once there was meaningful fire on the ground across the southern Interior, southerly Chinook winds through the Alaska Range passes took on extra significance. The Initial Spread Index (ISI) is the fire weather index that most clearly depicts the impact of wind on wildfire behavior. Figure 15 shows ISI values across the state on August 6th during a typical Chinook wind event, which emphasizes where localized strong winds occur in complex terrain in the southern Interior.

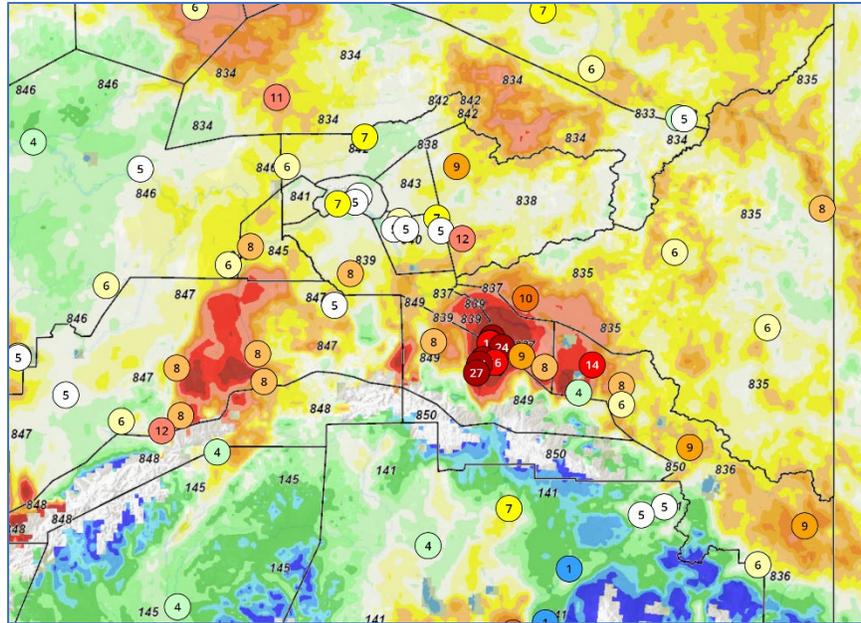


Figure 15: Initial Spread Index on August 6, 2023. Note the locally extreme values in Isabel Pass.

By the second half of August, temperatures had begun to cool and many areas, especially across Western and South Central Alaska received repeat bouts of wetting rains. The wildfire season petered out by the end of August, with minimal staff working the few remaining wildfires.

Conclusion:

Alaska's 2023 wildfire season finished with a total of just under 300,000 acres burned, per figure 16. Based on the last 30 years of data, this number is roughly half the climatological median value for an entire season and can seem unremarkable at first. But when one considers that as late as July 24th there had been less than 2,000 acres burned, 2023 stands out as "the little wildfire season that could" in late July and August. Figure 17 shows how dominant August was in contributing to the number of acres burned for the season. There is no indication in the decades-long data that such a dominant portion of the acres burned were consumed so late in Alaska's season.

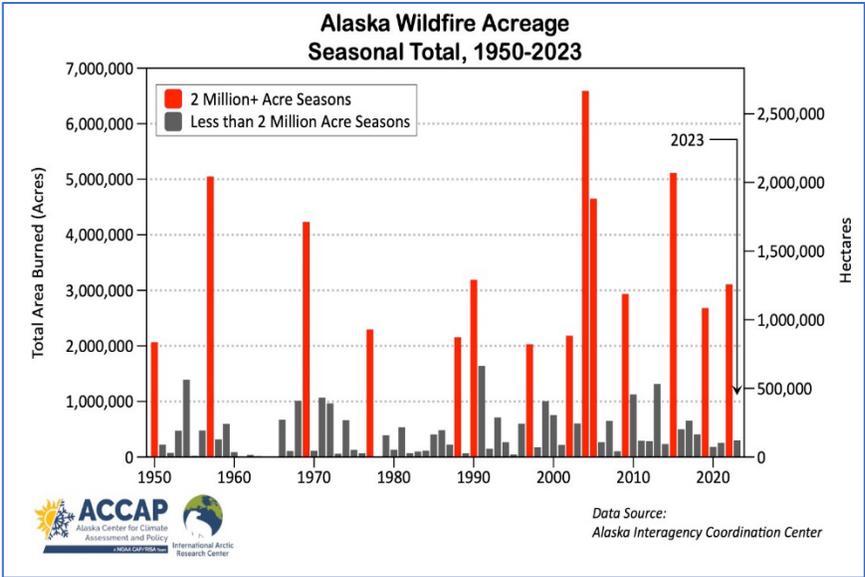


Figure 16 2023 compared to seasons over the last several decades.

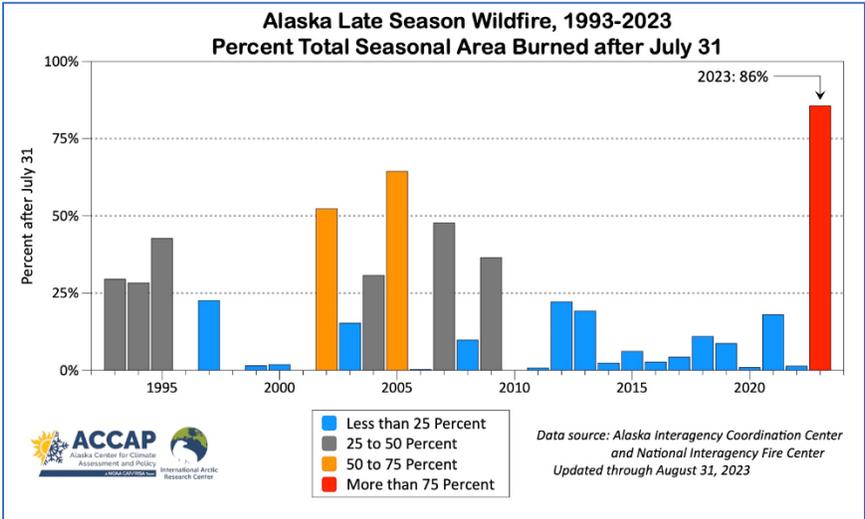


Figure 17: The lopsided contribution of August to the seasonal total number of acres burned.