Summary of Fire Weather for the 2025 Alaska Fire Season

2025: a slow start, followed by a typical season

As early as February, there was concern that a low snowpack across southern Alaska due to warm precipitation events would lead to a busy early season. However, April and May remained cool and wet, quelling fears. It was not until the second week of June that high pressure aloft set up a hot and dry pattern, rapidly drying fuels prior to that infamous critical fire weather pattern of ridge breakdown, leading to numerous lightning ignitions. From there, a lack of precipitation kept the season busy until mid-July, when southwest flow finally brought in widespread rain. Figure 1 shows the daily observed fire growth across Interior Alaska for the 2025 season compared to historical average and extreme values of BUI and fire growth.

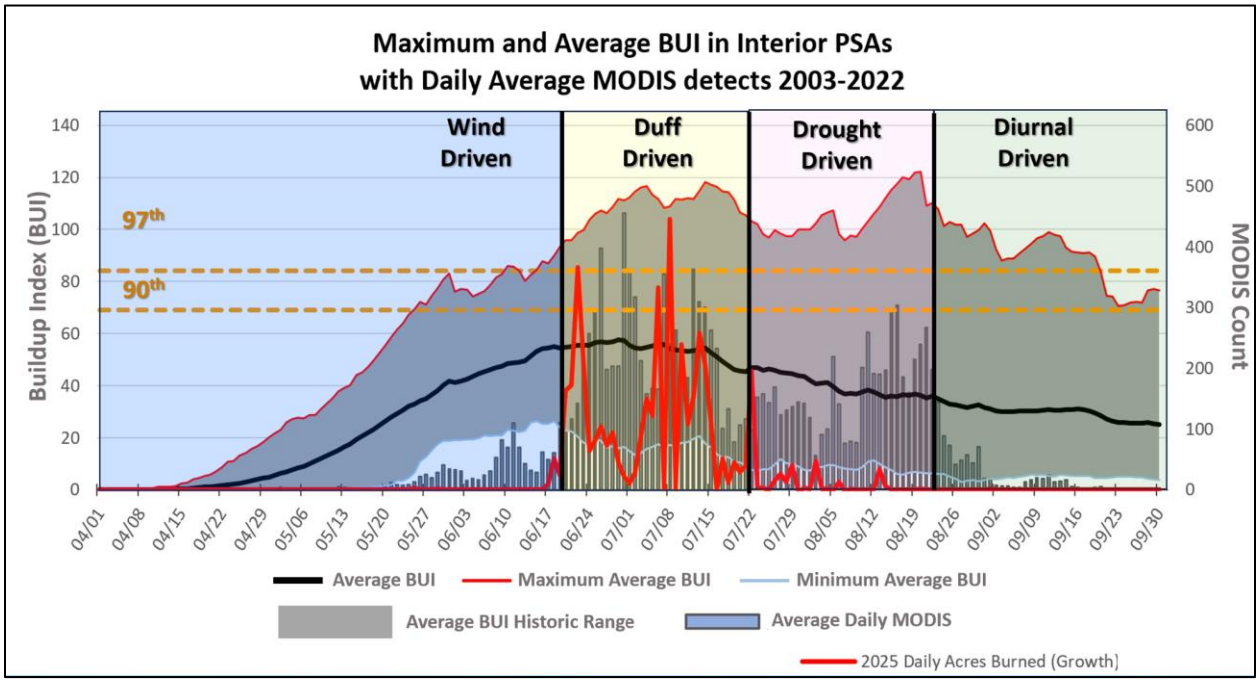


Figure 1: Daily acres burned for Interior AK for 2025 Alaska Fire Season as compared to historical BUI and fire growth.

Setting the Stage: A snowless winter

With what seemed like the start of an excellent winter, Anchorage reported nearly 20 inches of snow at the beginning of November. By the end of January, that snowpack had been decimated by rain and warm temperatures. The landscape remained barren through mid-March, when some snow arrived, but it was gone within a week. As evidenced by Figure 2, which shows the Snow Water Equivalent Percent of Median using ERA5 data for March 24th, it was evident that

much of the Southwest and the Panhandle, as well as populated parts of South Central, suffered from a very low snowpack. Weather cameras confirmed virtually no snow in those areas. This led to heightened concern that the fire season could be off to a very early start in the south.

Meanwhile, in the Interior, snowpack was generally at or above normal, though the Yukon Flats and Copper River Basin had a lower amount than normal. The North Slope and parts of the Seward Peninsula also had low snowpack.

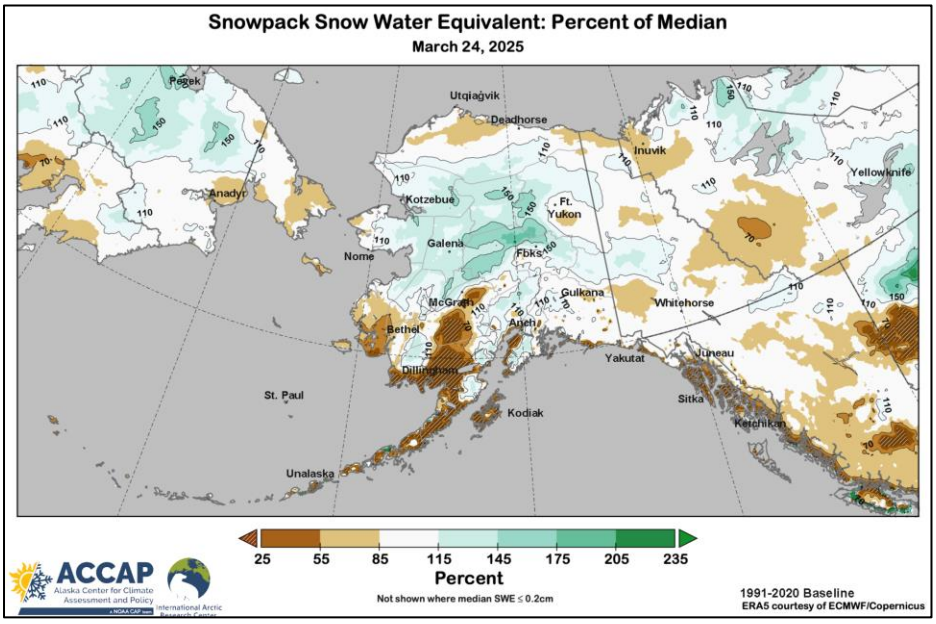


Figure 2: Snowpack Snow Water Equivalent: Percent of Median as of March 24th, 2025 showed little change since mid-February.

This led to a forecast for above normal fire potential in the south for the Wind-Driven Season (from snow-free until mid-June), as depicted in Figure 3. There were no early season indicators for the rest of the summer, which was forecasted to be normal.

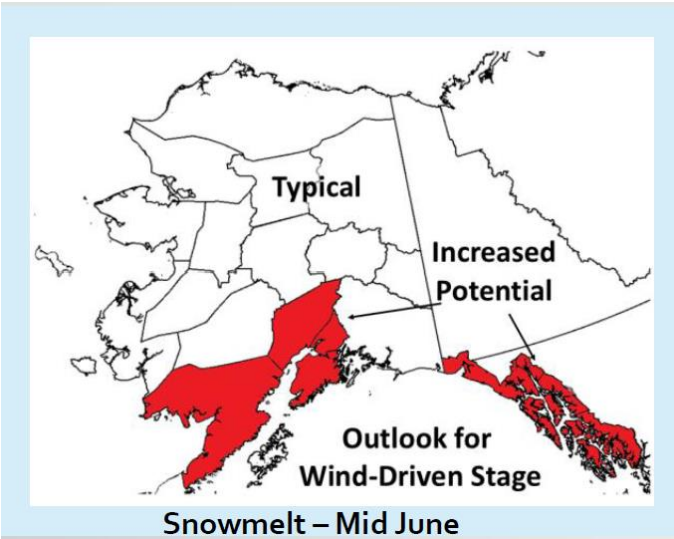


Figure 3: AICC Predictive Services significant fire potential forecast for Alaska for the Wind-Driven season.

Wind-Driven Stage: April and May to the rescue

Fortunately, a very wet April followed this snow-free winter. Figure 4 shows average temperature and total precipitation departures from normal for April and indicates that though eastern and southern Alaska were warmer than normal for the month, the precipitation amounts were above 200% of normal for many of those same areas. This prevented fuels from drying out and kept fire concerns low.

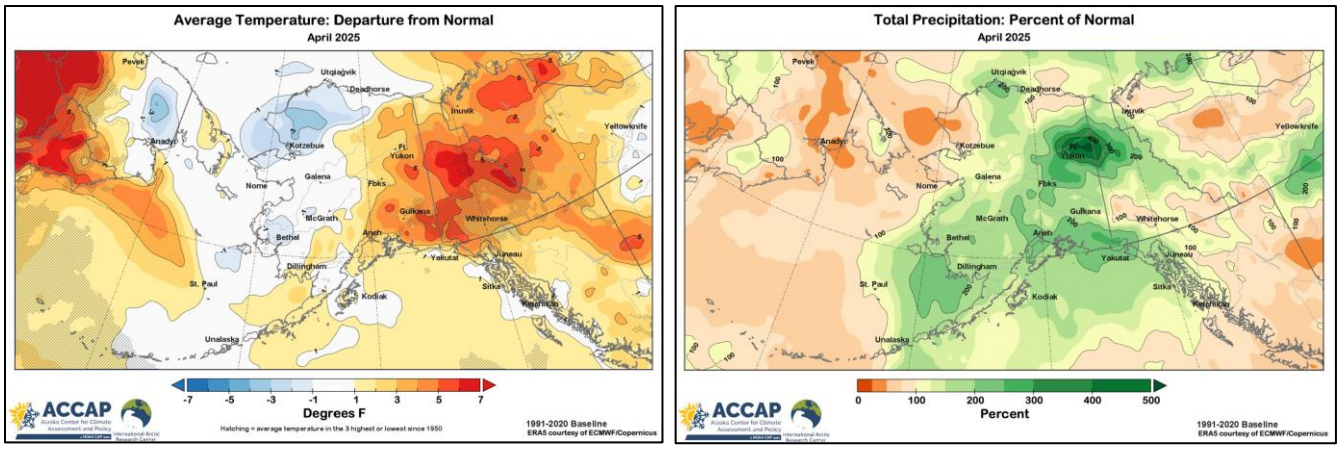


Figure 4: April average temperature departure from normal and total precipitation percent of normal, using ERA5 reanalysis with 1991-2020 as a baseline.

May continued to keep conditions quelled with more very wet weather in the south, and cooler than normal conditions, including the Interior. Again, this meant that fuels could not significantly dry, and fire potential remained very low. Figure 5 shows both temperature and precipitation departure from normal for May.

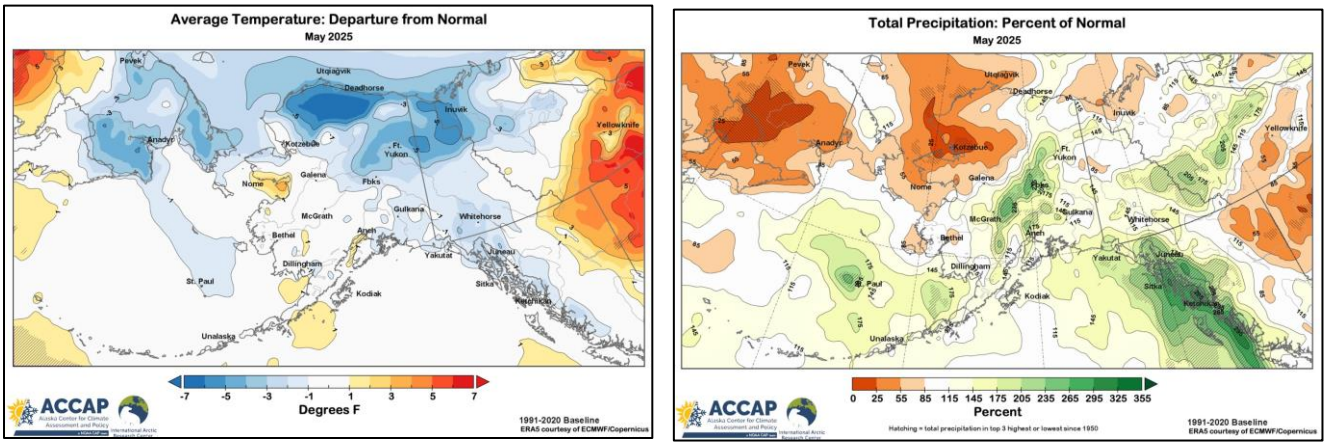


Figure 5: May average temperature departure from normal and total precipitation percent of normal, using ERA5 reanalysis with 1991-2020 as a baseline.

By the end of May, only 1,084 acres had burned statewide, and over 1000 of those acres were due to the Kathul fire in the Upper Yukon Zone, which ignited on 5/25 and actively burned the last week of May. Figure 6 shows that this was one of the slowest Wind-Driven seasons in recent history.

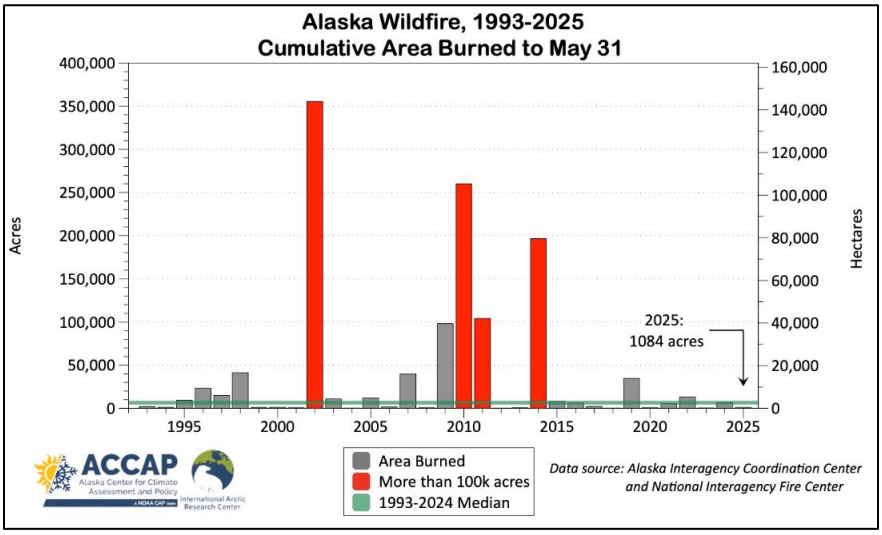


Figure 6: Acres burned by Alaska wildfires as of May 31st, 2025, per AICC.

Duff-Driven Stage: And then, summer arrived

June started out cold, with high temperatures still in the teens in the north during the first week. June 10th saw the first widespread 70s appear, and by June 12th, several 80s were observed. From that point, hot and dry weather persisted until late in the month. Figure 7 shows the temperature transition in just a matter of days.

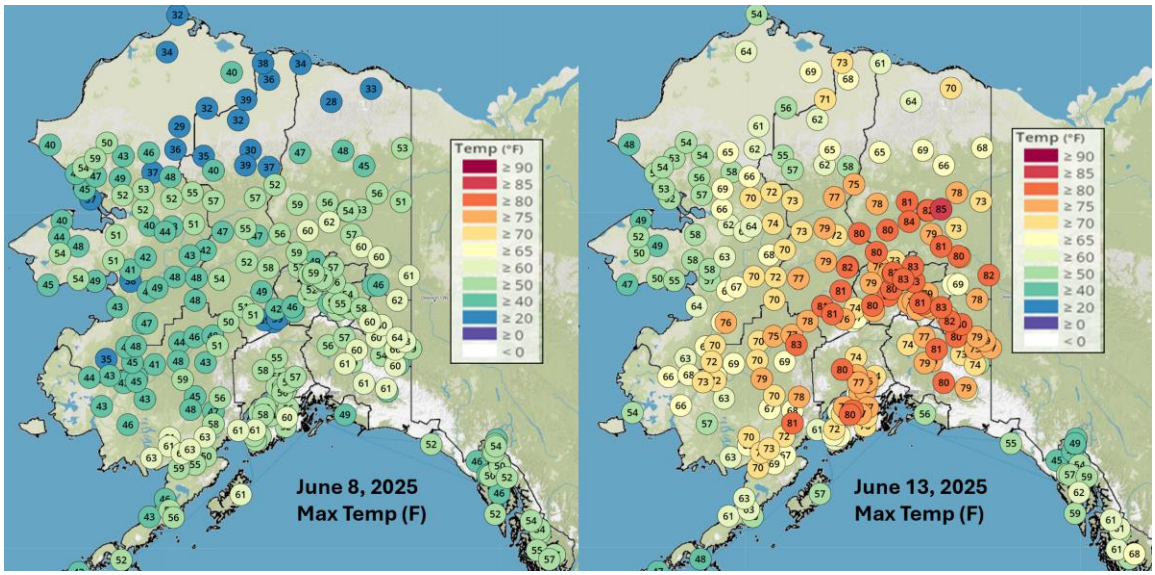


Figure 7: Comparison of maximum temperatures for June 8, 2025 and June 13, 2025 from Alaska Fire and Fuels Website.

Strong ridging aloft set up for about ten days, and though it waned towards the end of June, on July 1st it built back even stronger, with temperatures into the 90s across the northern Interior for five consecutive days through July 6th. The composite graphics in Figure 8 show the 500 mb anomalies in the top images for the two periods, and 1000 mb anomalies in the bottom images.

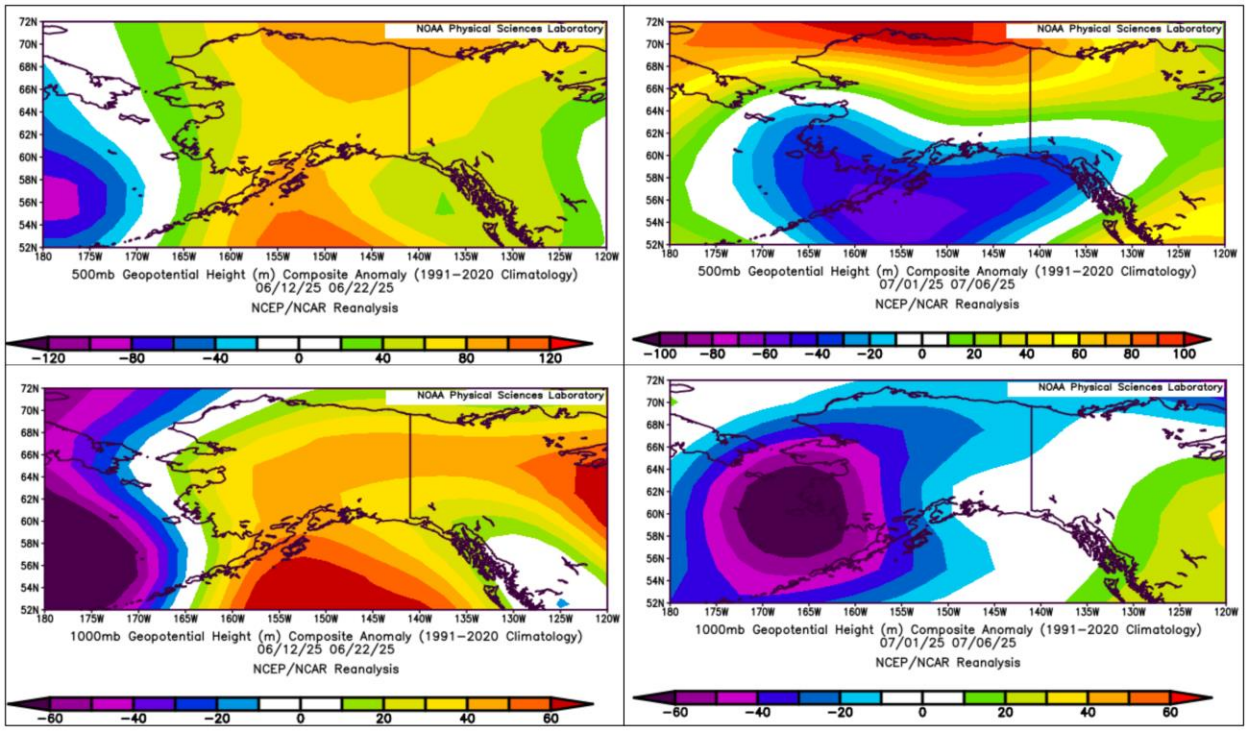


Figure 8: Composite anomalies for 500 mb and 1000 mb for two active periods of the 2025 fire season, June 12-22 and July 1-6.

The average temperature departures for June (Figure 9) don't appear to be strong as might be expected because the first eight days of the month were much cooler than normal and masked the heat of later in the month. Despite that, the signal indicates that the northern half of the state, including much of the Interior, was warmer than normal, while colder than normal in the south. Total precipitation was below normal on the eastern North Slope, the central to eastern Interior, and inland Southwest. Most other areas were above normal, including much of South Central. That precipitation pattern kept the heart of fire activity in the Interior, never allowing it to get a strong foothold in the southern portion of the state.

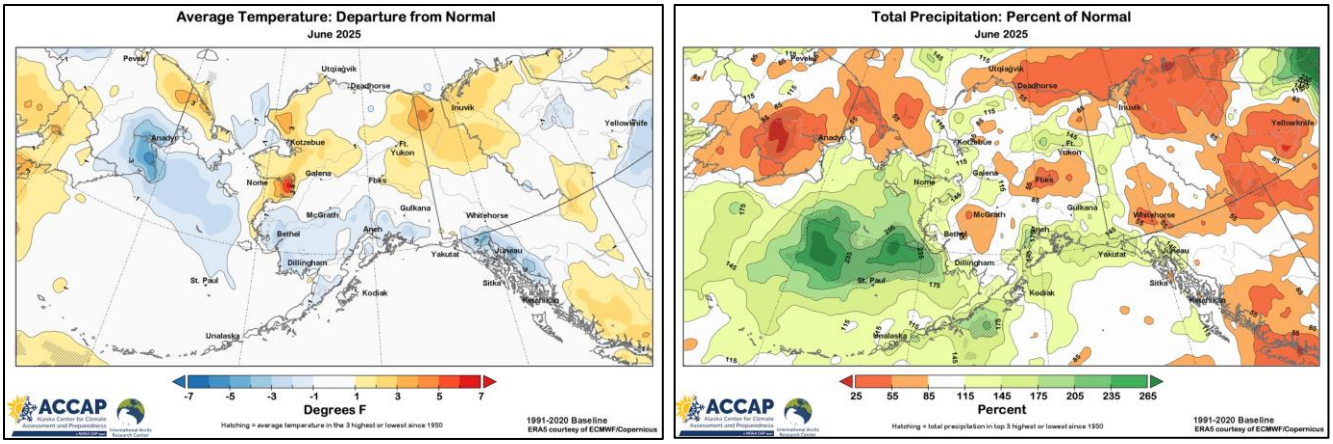
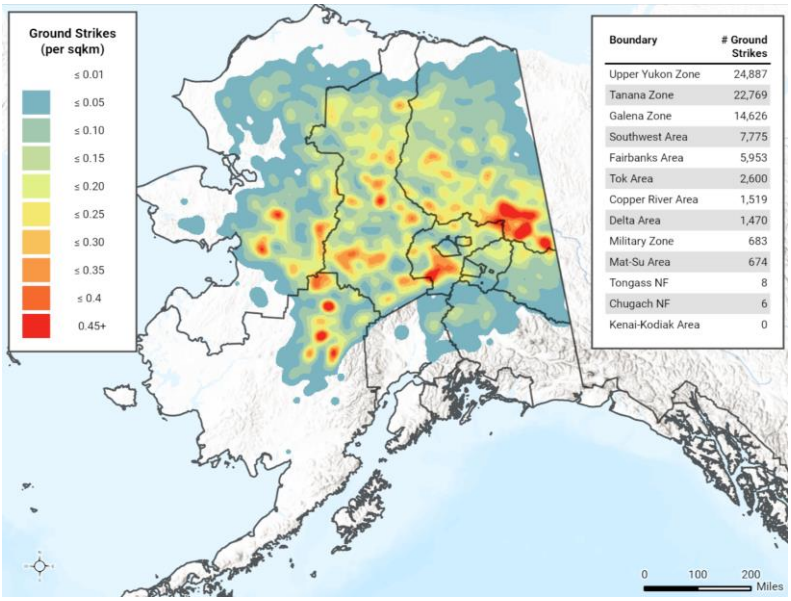


Figure 9: June average temperature departure from normal and total precipitation percent of normal, using ERA5 reanalysis with 1991-2020 as a baseline.

The weather factor that played the most significant role in jump-starting the fire season was lightning as the ridge aloft fluctuated in intensity. From June 16-22, there were more than 160 lightning-caused fires with at least 10 or more starts each day. Red Flag Warnings for abundant lightning were issued for most of those days. Another 15 new starts were reported over the last week of the month as a few thunderstorms lingered, and holdovers came to light. The long daylight hours and hot, dry weather allowed these fires to grow quickly, pushing resources to the limit. As a result, many of these ignitions that were near values at risk that couldn't be immediately caught became problem fires for the next few weeks. Figure 10 shows the lightning distribution across Alaska for the two-week period from June 16-30, 2025.



Boundary	# Ground Strikes
Upper Yukon Zone	24,887
Tanana Zone	22,769
Galena Zone	14,626
Southwest Area	7,775
Fairbanks Area	5,953
Tok Area	2,600
Copper River Area	1,519
Delta Area	1,470
Military Zone	683
Mat-Su Area	674
Tongass NF	8
Chugach NF	6
Kenai-Kodiak Area	0

Figure 10: Lightning activity detected by BLM Alaska's Lightning Detection Network (ALDN) from June 16-30, 2025.

Thunderstorms continued to be very active through the first week of July, with a few periods of higher activity in mid-July and early August, as shown in Figure 11. This lightning trend correlated well with historical lightning patterns of the Alaskan summer. Another series of Red Flag Warnings were issued for abundant lightning across the Interior for July 6-7. Throughout

the first three weeks of July, 56 new lightning ignitions were found. After that, conditions moderated, making the landscape less susceptible to new starts.

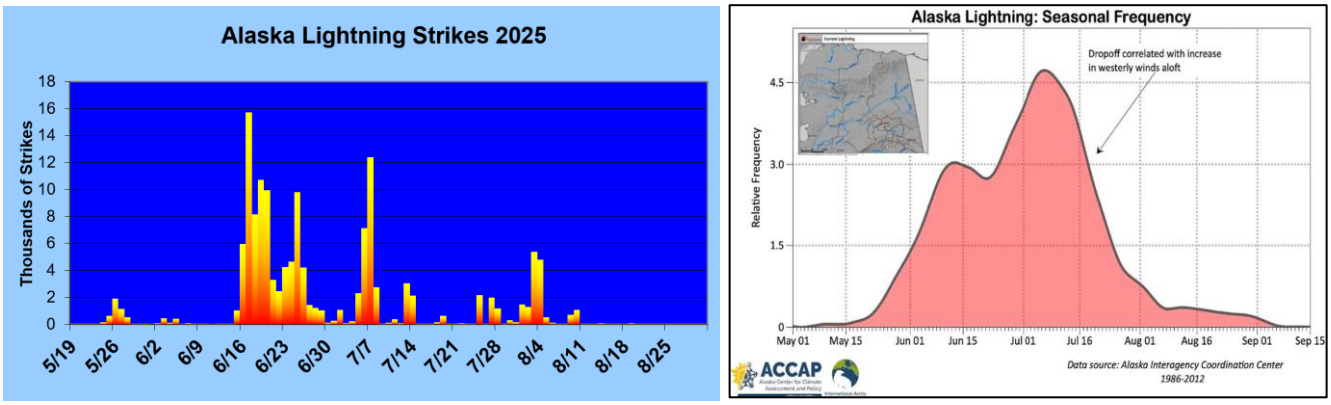


Figure 11: Daily lightning activity detected by BLM Alaska's Lightning Detection Network (ALDN) for the 2025 fire season, and Seasonal Lightning Frequency for the period from 1986-2012 (lightning detection infrastructure changed after 2012 and would be too dissimilar to include with the longer database).

Along with new ignitions, fuels were dried for rapid spread by the summer solstice. A week of strong warming and drying during the second week of June led fuels to be very flammable by the time lightning began in earnest. The Buildup Indices for summer solstice on June 21st and two weeks later during the next big warming and drying event are shown in Figure 12. These dry fuels led to large spread rates from June 19th through the 28th, and again from July 3rd through the 15th. By the end of the second period, over 870,000 acres had burned statewide.

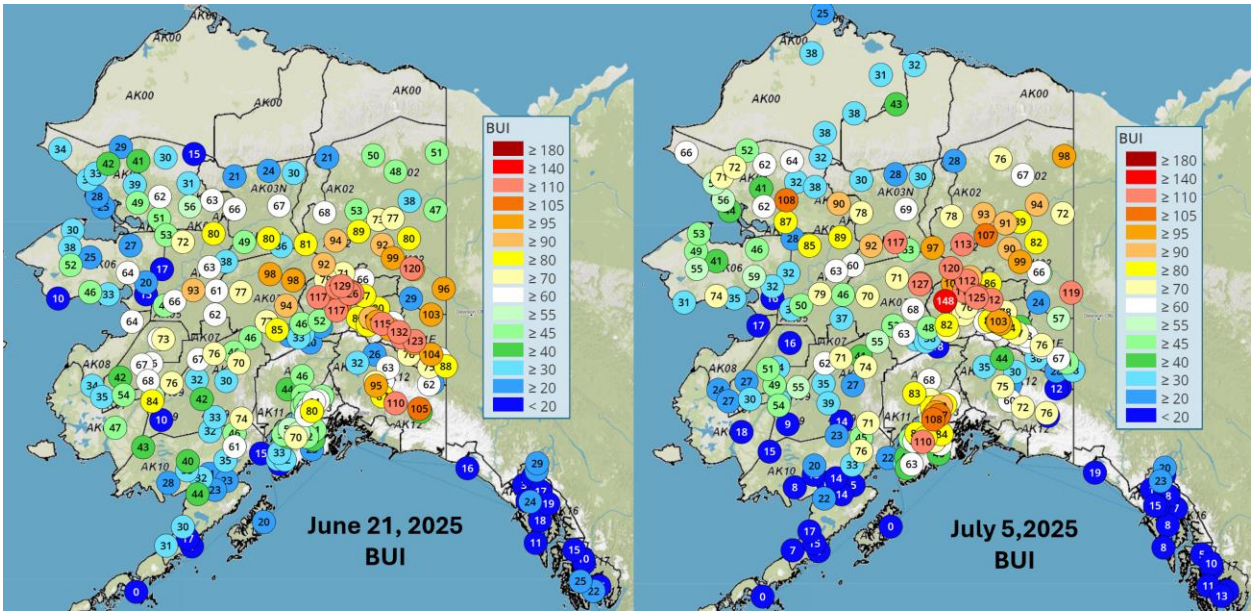


Figure 12: Buildup Index at summer solstice, June 21, 20205, and two weeks later, towards the end of the next heat wave, during the heart of Duff-Driven Season. Graphics are from the Alaska Fire and Fuels Website by MesoWest.

July's average temperature departures (Figure 13) show warmer than normal in the north and east, with a strong warm focus in Northwest Alaska. This coincides with a very active fire period in the Northwest, with the Gold Run Complex along the Kobuk River comprised of nine fires that made some large runs during the first half of the month, until widespread rain started intruding on July 15th. Red Flag Warnings for Hot, Dry, and Windy conditions were issued for much of the Interior between July 2-5, with rapid fire spread occurring on those days.

July saw a lot of variability, with multiple periods of hot and dry weather followed by cooler temperatures and significant rainfall that impacted most areas. Despite having some very wet days, Figure 13 shows July's precipitation was much below normal in many areas. Since July is normally the wettest month of the year in the Interior, the drier than normal pattern seemed less obvious, but the deficit was evident in that fires continued to be active throughout the entire month.

At the peak of activity from July 10th through 13th, as many as 1,950 firefighters were out on staffed fires in Alaska, with many more working in dispatch centers and warehouses to keep support flowing.

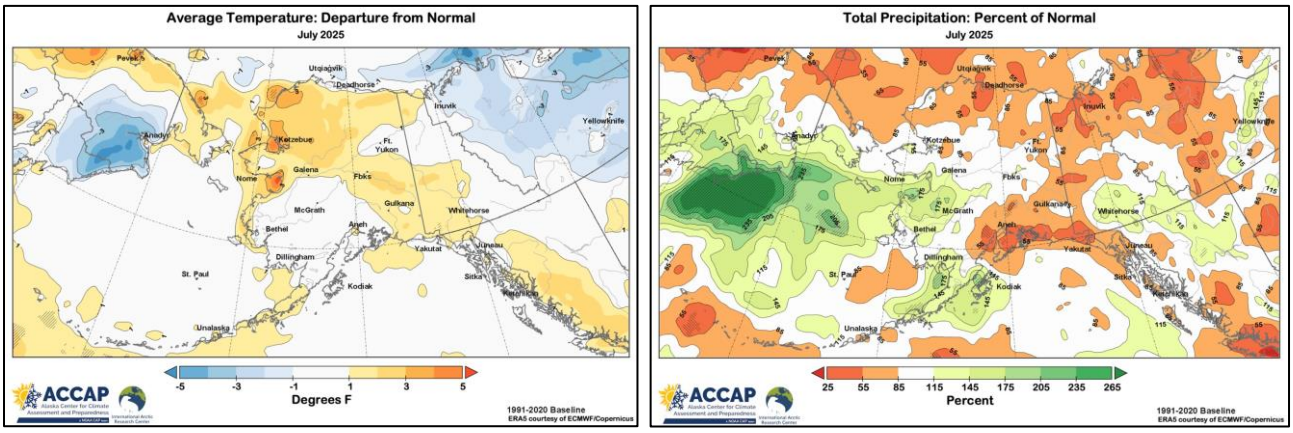


Figure 13: July average temperature departure from normal and total precipitation percent of normal, using ERA5 reanalysis with 1991-2020 as a baseline.

Drought-Driven Stage: Rains arrive on time

July 15th saw a quick flip to a much wetter pattern. Precipitation started to become more widespread as the late summer pattern of Southwest Flow, depicted in Figure 14, set up over the state. This pattern allows moisture to move in from the Bering Sea, following the terrain and penetrating far into the otherwise-sheltered Alaskan Interior.

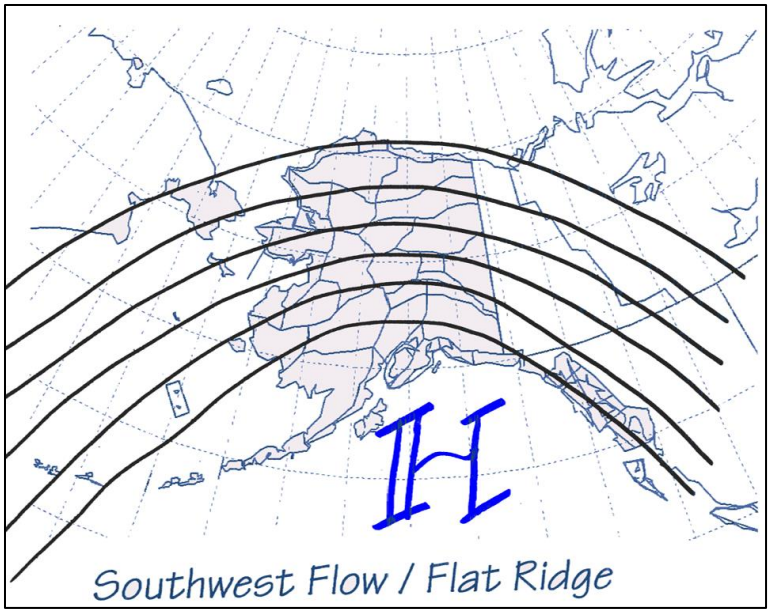


Figure 14: Classic 500 mb pattern describing Southwest Flow over Alaska, which is referred to as the "Season-Ending Event" that appears annually at the end of July or early August, bringing rains critical to ending fire season.

Though it took some time for significant rain to impact all fires, by the end of the month fuels had dampened considerably, slowing fire growth. By the onset of the Drought-Driven Season in mid-July, an inch of rain or more over several days is needed to have long-term impacts, and even this is not enough if fuels are extremely parched. Figure 15 shows two select heavy rain days across the state. The first, on July 15th, impacted western Alaska, while the second, on July 21st, funneled rain into the east, particularly the Yukon Flats, which had been quite dry.

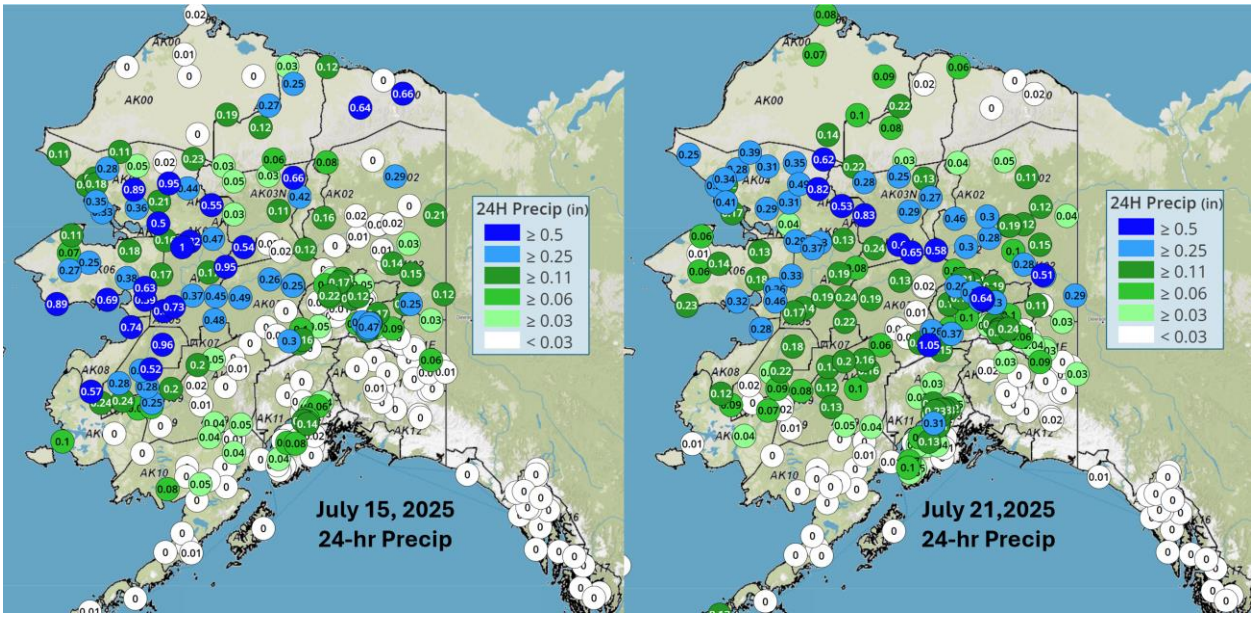


Figure 15: 24-hour precipitation totals on July 15th, the first day with substantial widespread rainfall, and July 21st, the first day significant widespread rain reached the northeastern Interior. Graphics are from the Alaska Fire and Fuels Website by MesoWest.

As the Drought-Driven season began, the first widespread rains entering the western side of the state began wetting the duff layers, and the Buildup Index began dropping, as seen in Figure 16 for July 16th. With more significant rains moving across most of the state, Buildup Index dropped. The graphic for August 1st shows that by the middle of this Drought-Driven season, only stations in the northeast Interior and the uppermost Tanana Valley had largely burnable fuels.

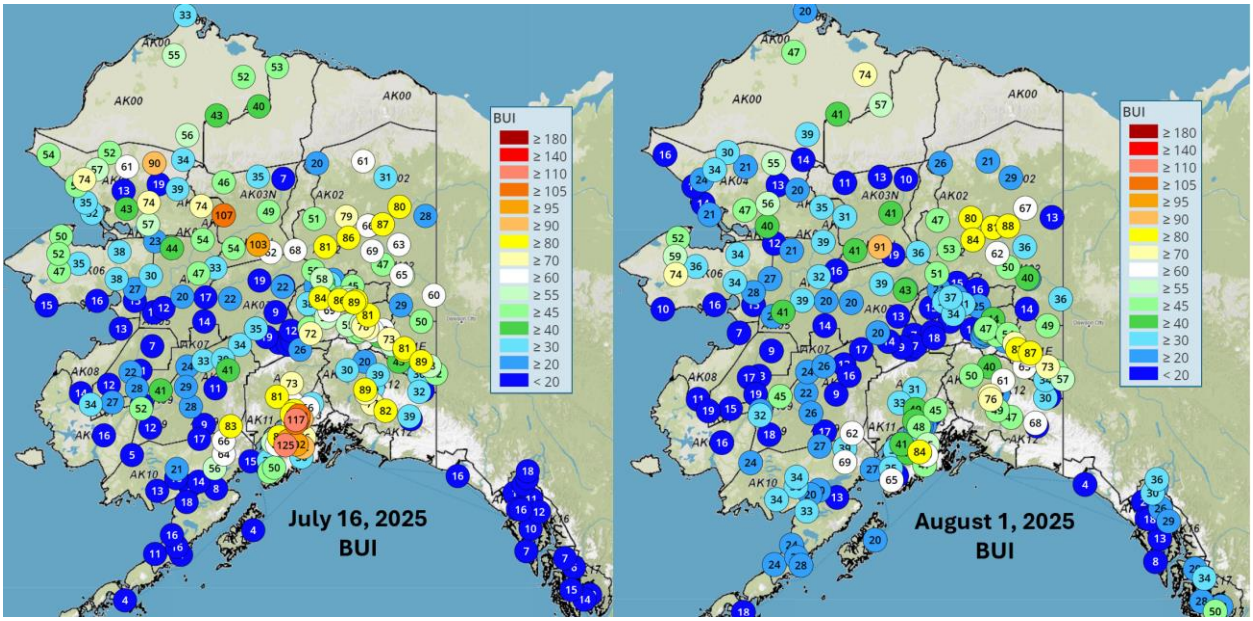


Figure 1: On the left, the Buildup Index on July 16th, marking the start of the Drought Driven Season and one day after the first western AK rain event. On the right, Buildup Index at the beginning of August, halfway through the Drought-Driven Season. Graphics are from the Alaska Fire and Fuels Website by MesoWest.

Fire activity slowed during this time due to the changing weather. Figure 17 indicates that by July 17th, activity had dropped, and only a few days after that showed large fire growth. Daily growth is a rough estimate since smoke and clouds may prevent accurate assessment. This leads to errors and adjustments so that some days may show negative growth, which is impossible. Those days default to zero in this figure.

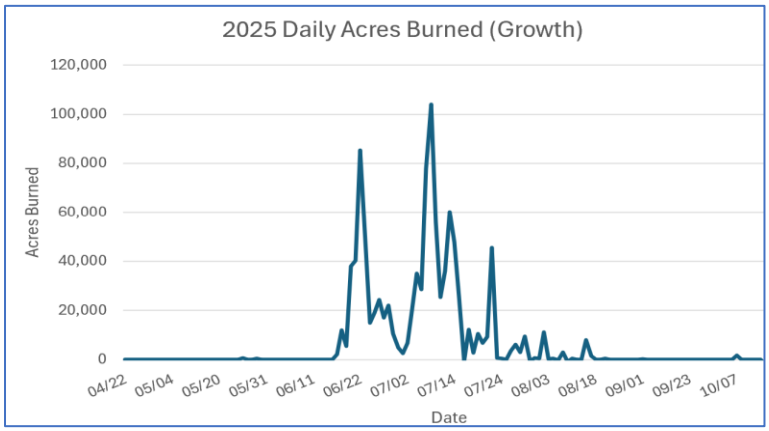


Figure 17: 2025 daily wildland fire acreage growth as reported to Alaska Interagency Coordination Center.

Diurnal Stage: End of the Season

The time frame for the diurnal stage is quite vague, starting around early to mid-August and lasting until freeze-up. Figure 17 shows that a few growth days occurred in early to mid-August, then numbers generally settled for the season. By August 18th, fewer than 150 people were out on staffed fires.

Figure 18 shows that August continued to be warmer than normal for most areas. However, precipitation was variable, with wetter than normal conditions north and west of a line from Eagle to Bethel, and drier than normal south and east. The biggest impact this had on fire season was that the area around Tok saw little rain, which allowed fires there to continue to smolder and pose a threat late in the season. Wetting rains moved through on the 15th and 16th of August and again on the 20th. After that, a dry pattern required an eye on Tok fires, and the last of the staffed fires for the state, the Seven Mile Lookout Fire, demobed around September 12th.

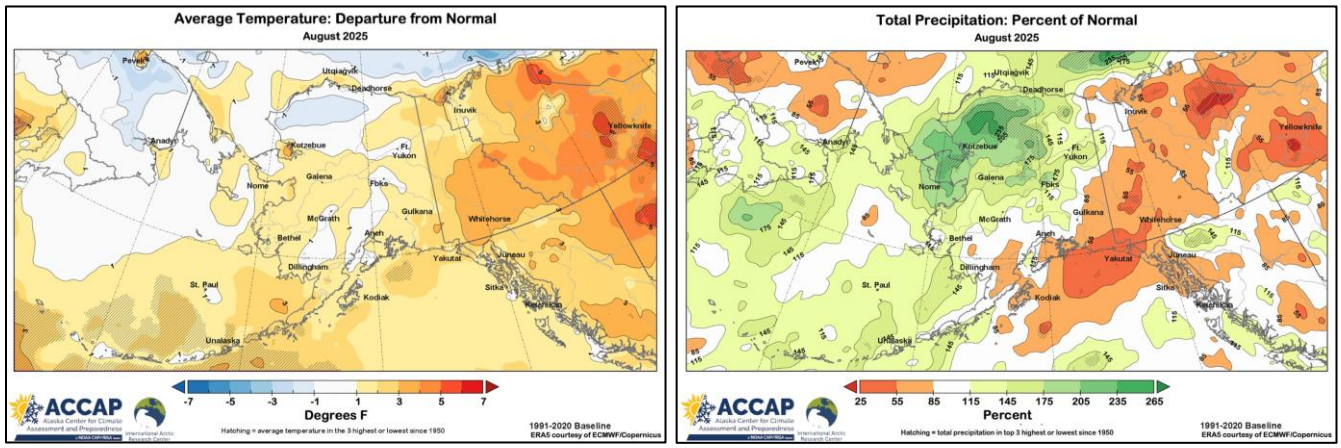


Figure 18: August average temperature departure from normal and total precipitation percent of normal, using ERA5 reanalysis with 1991-2020 as a baseline.

Conclusion:

Alaska's 2025 wildfire season finished with 467 fires burning a total of approximately 1,006,183 acres. Both the number of fires and acreage are very close to the average of the last ten years (479 fires and 967,277 acres), though well above the median values (392 fires and 576,927 acres). Based on data since 2000, this fire season comes in as the tenth largest and is well below the average of 1,422,756 acres for that time frame. Perhaps the most interesting aspect of the season is that it fits the normal fire growth distribution, as seen in Figure 1, with the season kicking off around the solstice due to a series of large lightning events following on the heels of a very dry period. Fire growth continued to show significant runs until mid-July, when widespread rains arrived, slowing growth and allowing firefighters to get a handle on critical fires. As August progressed, rains continued off and on, leaving the eastern Interior to have some activity until just prior to freeze-up. In short, 2025 described a very typical fire season for Alaska.