2019 Fire Season Weather Summary

Summary

The 2019 season got off to a fast start as warm temperatures in March initiated an early and gentle melting of the snowpack, which allowed the threat of grass-fueled fires to arise in April. Red flag warnings were issued for the windy areas on the north side of the Alaska Range as early as April 10th and 11th, and the Oregon Lakes fire became an early-season challenge in the breezy Delta Junction area as it burned nearly 35,000 acres. As spring gave way to summer, the occasionally record-setting warmth persisted, and by early and mid-summer an active season was well underway across much of the state, with most of the significant fires, as usual, occurring in Alaska's Interior. These fires included the 22,000-acre Shovel Creek Fire near Fairbanks, and the Chalkyitsik and Cornucopia Complexes in the Upper Yukon Valley.

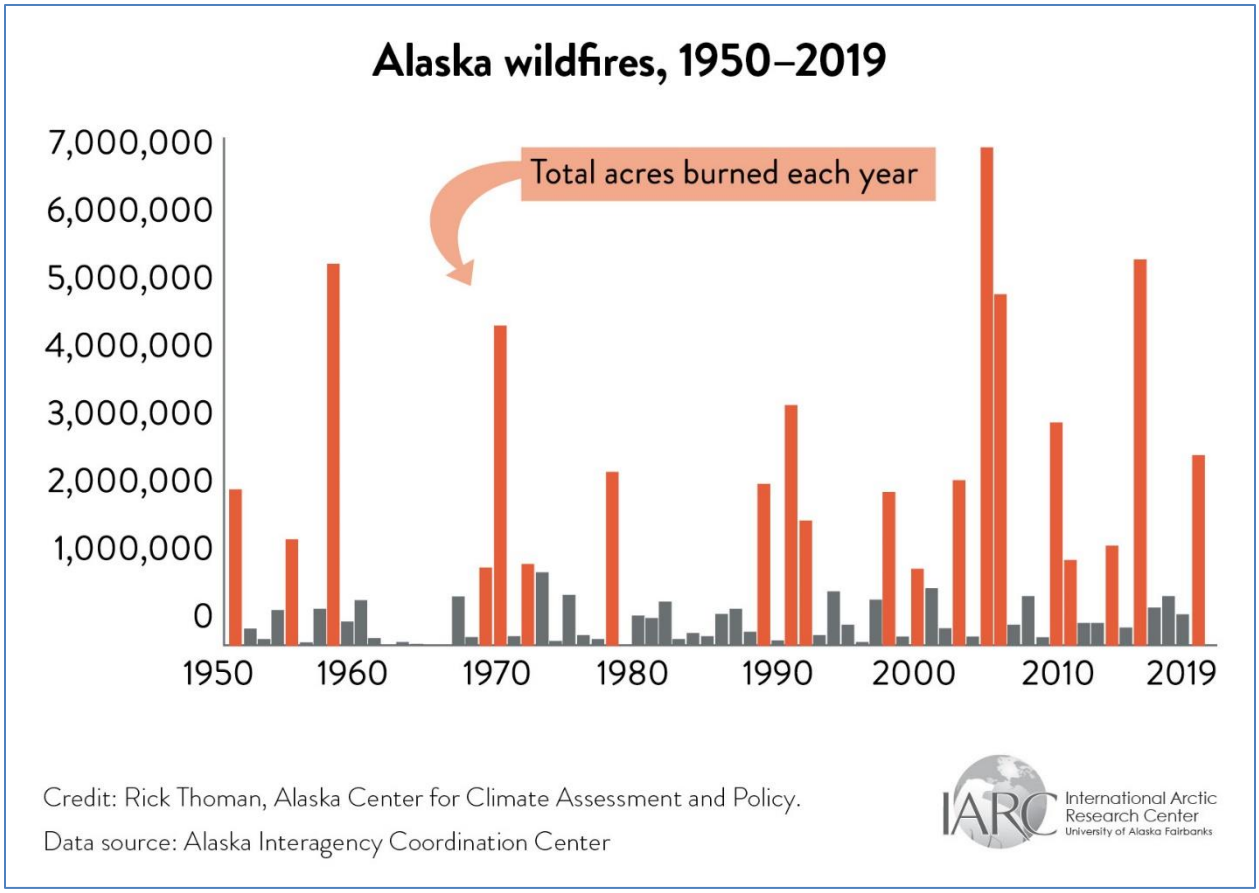
South Central was not without its significant events in early and mid-summer either, as the Swan Lake Fire on the Kenai Peninsula often produced smoke that impacted portions of the Kenai and the Anchorage bowl. Anchorage set its all-time record high temperature on the Fourth of July at 90 degrees, and the 25-acre MLK Fire erupted in urban Anchorage during the heat of early July.

By the second half of the summer the climatologically-favored rains did in fact arrive over Alaska's Interior to mitigate fire activity there, but no such moisture became available in South Central Alaska where the fuels continued to dry and the Swan Lake Fire continued to burn, eventually consuming over 167,000 acres. With the fuels so dry in South Central, hidden ash pits became an extra and unwelcome hazard for firefighters. A northerly wind event in South Central helped drive the fast-moving McKinley Fire as it started on August 17. This wildfire along the Parks Highway in the populated Matanuska-Susitna Valley, despite its comparatively small footprint of only around 3,300 acres, destroyed over fifty structures before it could be brought under control. Wildfires slowly became less active with time as August turned to September, and routine fire weather forecasts for Alaska were ended on September 20th.

While all this activity was blossoming over Alaska, fire activity in the Lower 48 was comparatively tame. Crews and equipment were thus available to be dispatched to Alaska and assist in firefighting efforts.

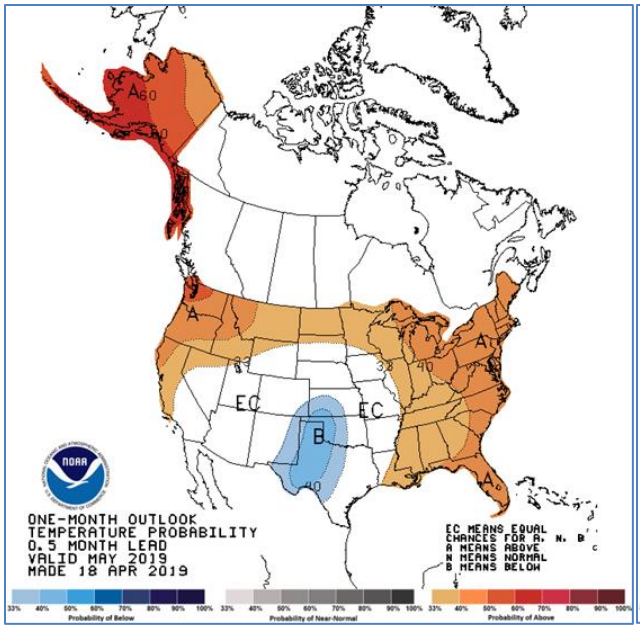
The season's total of 2,585,625 acres burned was well above-average and very much above the median total. For purposes of comparison, the table at right includes the number of fires and number of acres burned in each of the last ten seasons.

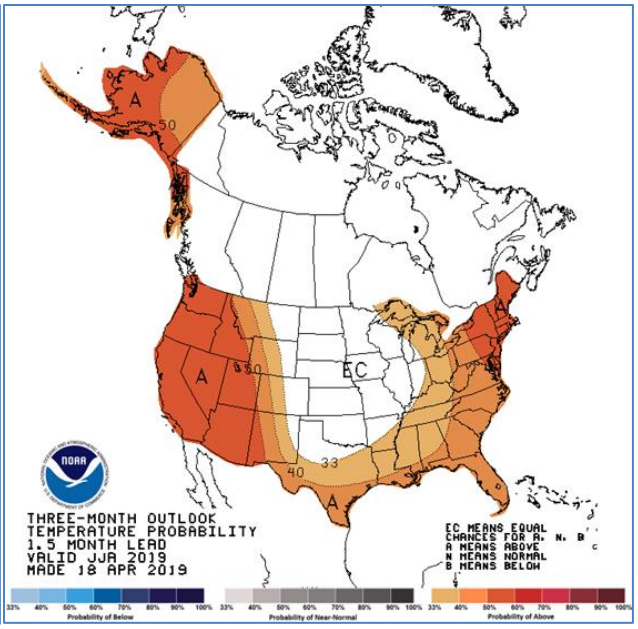
Year	# of Fires	# of Acres
2010	688	1,125,419
2011	515	293,018
2012	416	286,888
2013	612	1,316,288
2014	377	233,544
2015	772	5,146,541
2016	552	499,559
2017	362	653,148
2018	362	411,176
2019	742	2,585,625
Mean	**533**	**1,260,591**
Median	**521**	**574,485**



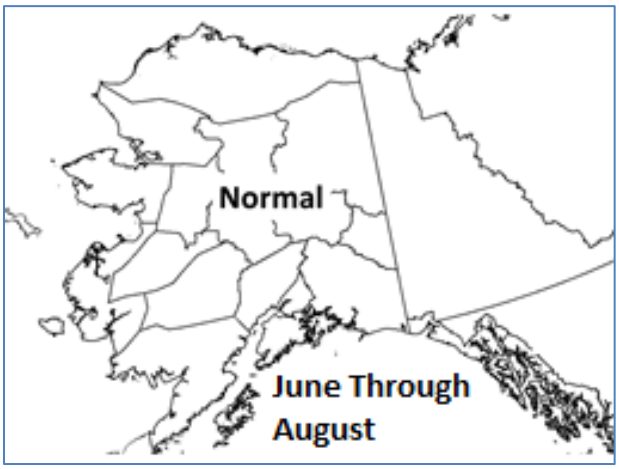
Season Forecast

Hemispheric-scale forcing mechanisms such as El Nino combined with a trend toward decreasing sea ice in Alaska's surrounding waters led to an expectation that temperatures would likely be above normal through the summer. The figures below show the forecasted probabilities of temperature for May (left) and the three-month period of June through August (right) as forecasted in April, with the highest probabilities for a warm summer coming along the western and southern coasts of Alaska. As it turns out, Alaska did have a warm summer in 2019, and several records were set.



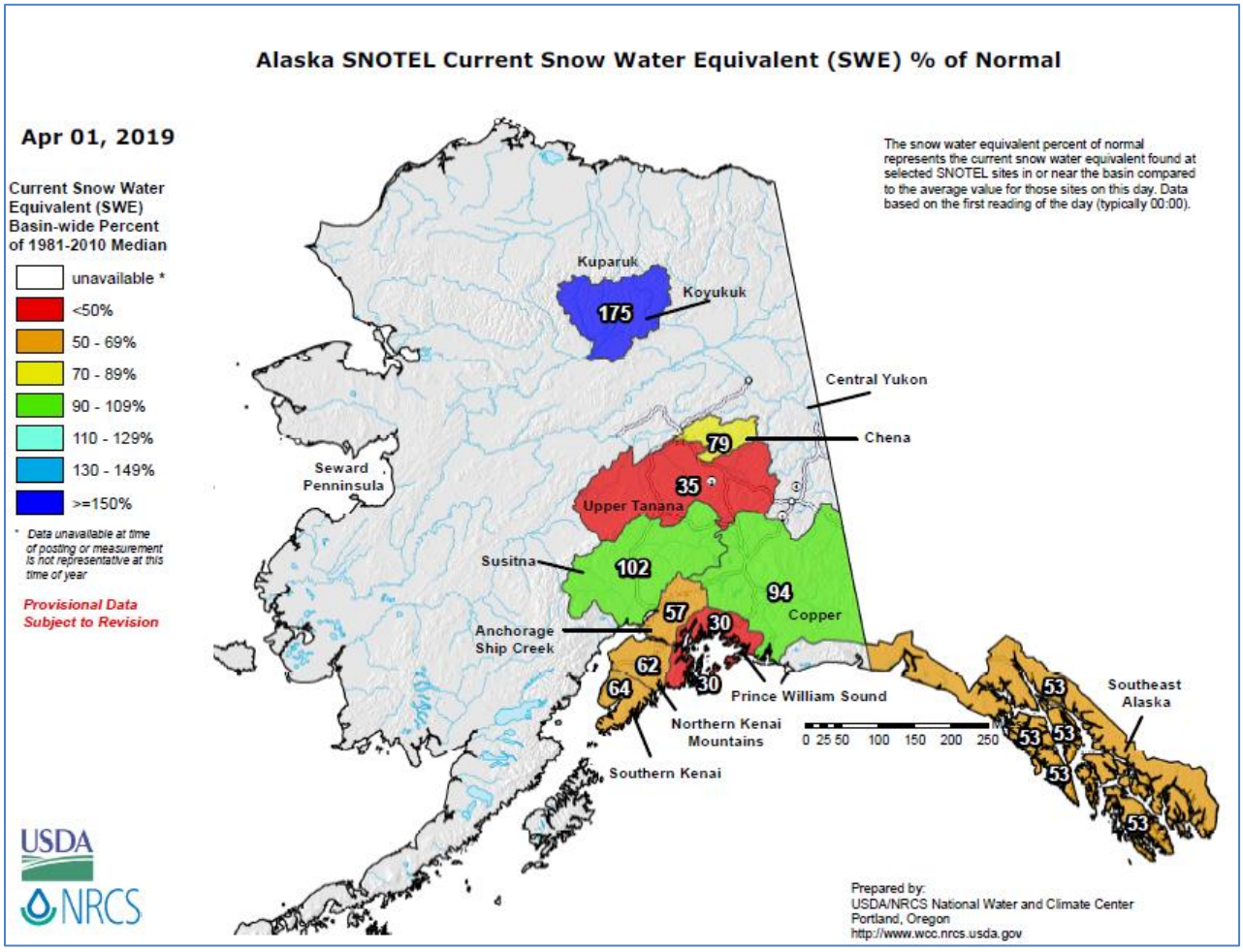


Early expectations were for a more active start to the season than normal over the southeastern Interior and South Central Alaska, with the warm temperatures in March and the early melting of the snowpack giving cured grasses left over from 2018 a chance to dry out before green-up and become available as fuels. After green-up, there was no strong signal suggesting a particularly active or quiet summer. Given how substantial the season in fact became, these expectations illustrate how difficult it is to forecast the character of an entire season so many months in advance.



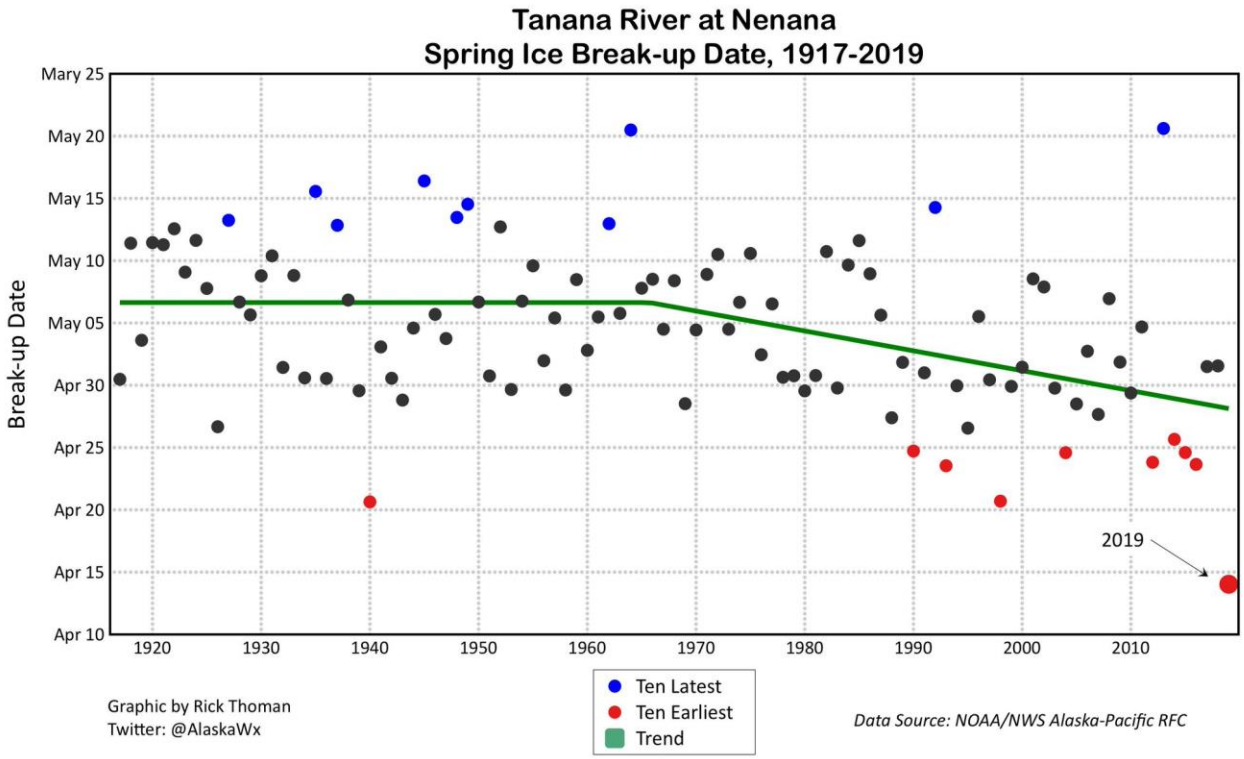
Spring Snowpack

As evident in the graphic below, the snow water equivalent (SWE) of the snowpack across Alaska on April 1st showed a variety of conditions across the state, with particularly low snowpack evident in the Tanana Valley and Prince William Sound. Anchorage, the Kenai Peninsula, and Southeast Alaska all had substantially reduced SWE at the beginning of April.

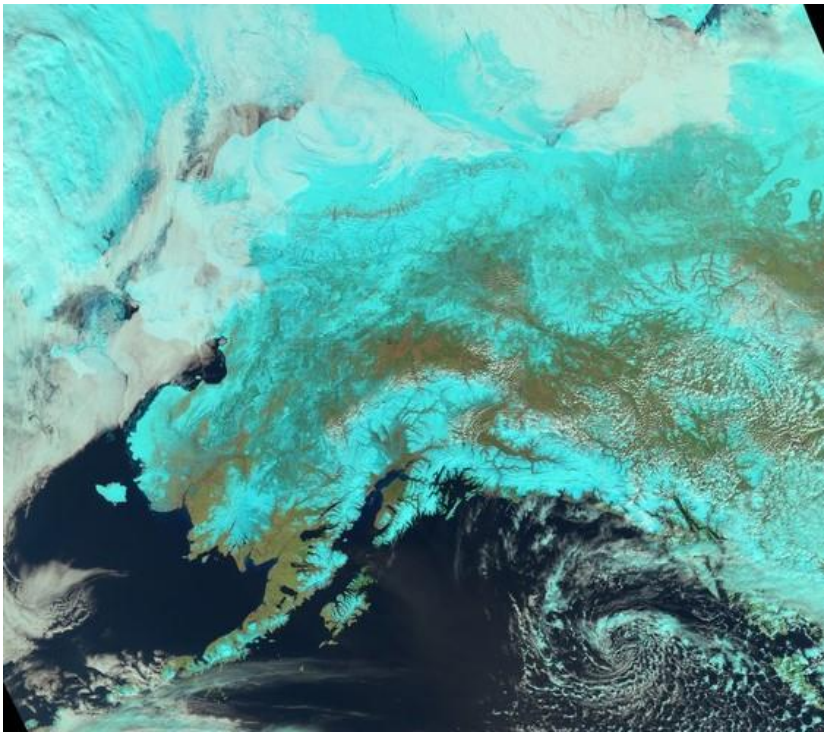


April

April of 2019 was, like March, very warm across much of the state. Notable readings included the warmest April in the record books at Kotzebue and the warmest three-month period of February through April at Utqiagvik. Bettles, and Bethel. Also, river breakup on the Tanana River at Nenana came unprecedentedly early, where the tripod moved on April 14th, nearly a week earlier than the previous record. The Kuskokwim River broke up at Bethel on April 12th, also a record early date.

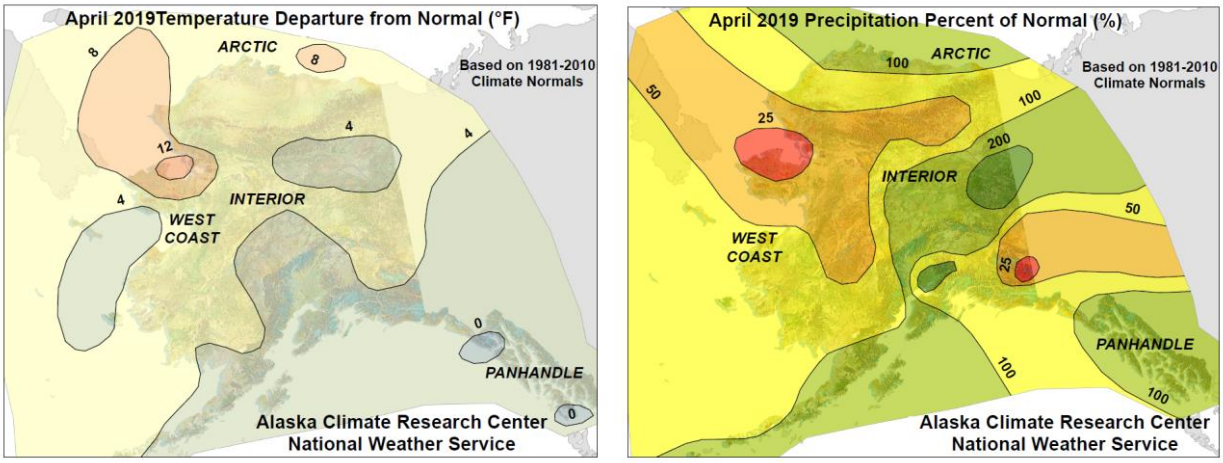


Below is an example of satellite imagery used to track the melting of snow across Alaska in the spring. Snow on the ground appears blue in this kind of imagery, and bare ground appears brown. The image is from April 26th. Note how portions of Alaska's Interior are free of snow. It was in these snow-free areas of the Interior that some of the season's first wildfires popped up.



False-color image from the Suomi National Polar Partnership (SNPP) satellite on April 26th. Image courtesy of UAF/GINA. Clouds appear white, snow-covered ground is blue, and bare ground is brown.

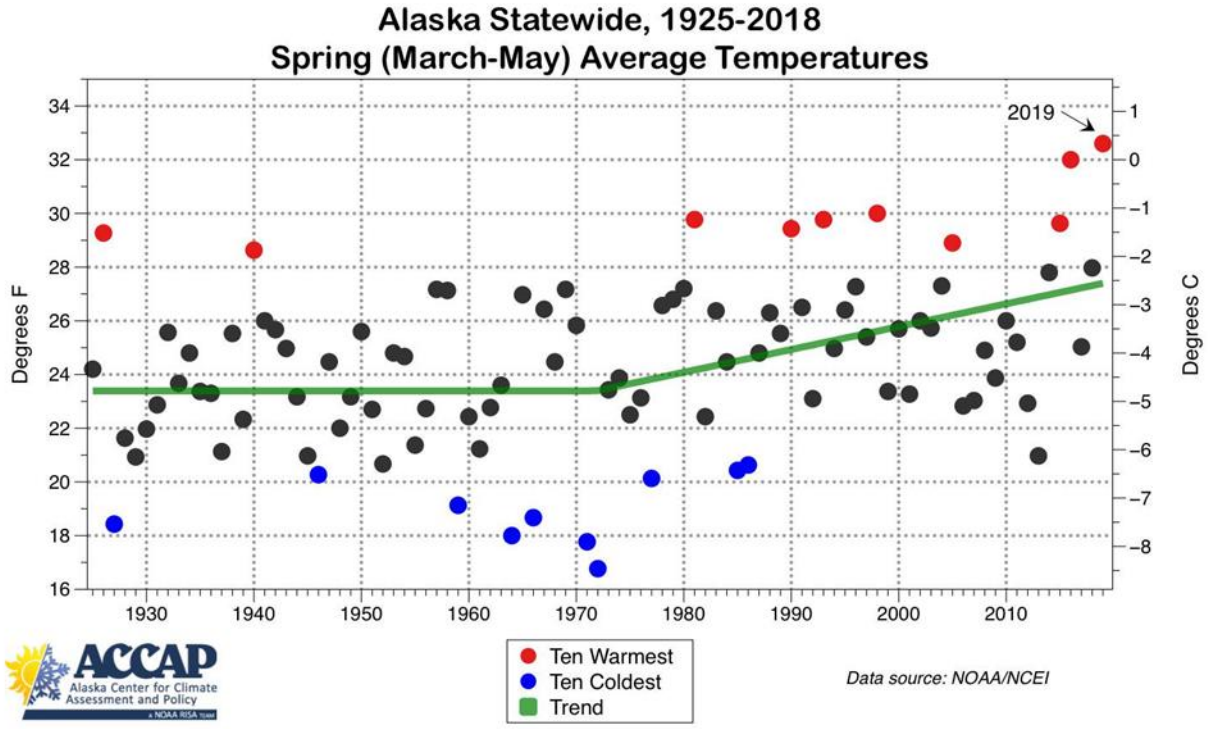
As seen in the temperature graphic at left below, only the Southeast Panhandle had no meaningful departure of temperatures from normal, while the remainder of the state, especially northwest Alaska and the North Slope, had departures well above normal for the month, with an impressive double-digit departure at Kotzebue. The precipitation signal, however, was less monolithic, with a mix of positive and negative departures from normal.



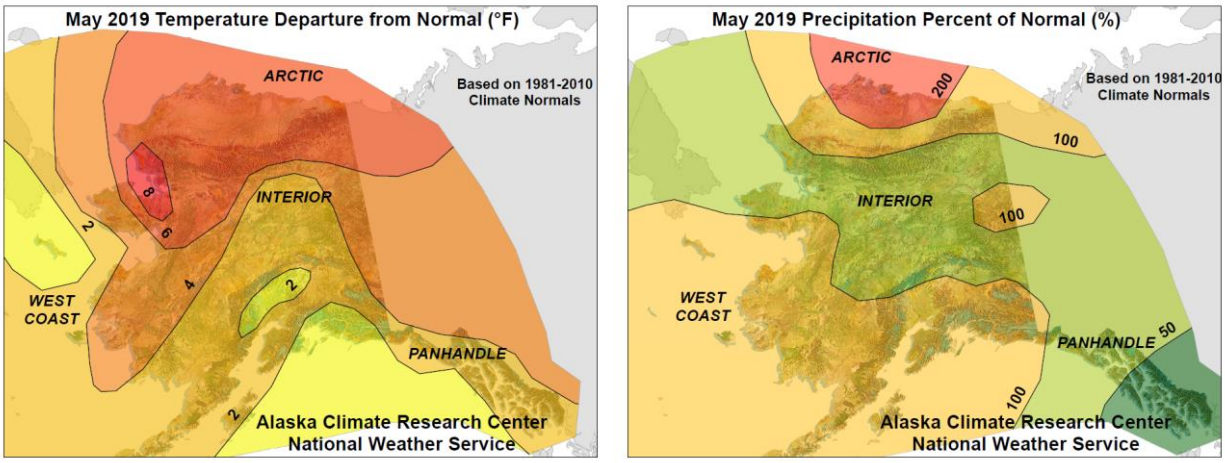
April 2019 Temperature Departure from normal (ºF) and Precipitation Percent of Normal

May

The warm weather continued across the state into May. As shown in the graphic below, the state overall had its warmest spring on record. One precipitation record was set: 2.18" of rain at Anchorage, making May 2019 the wettest May ever recorded. The wet trend in South Central Alaska was not to continue, however. In fact, just the opposite was in store for South Central later in the summer.



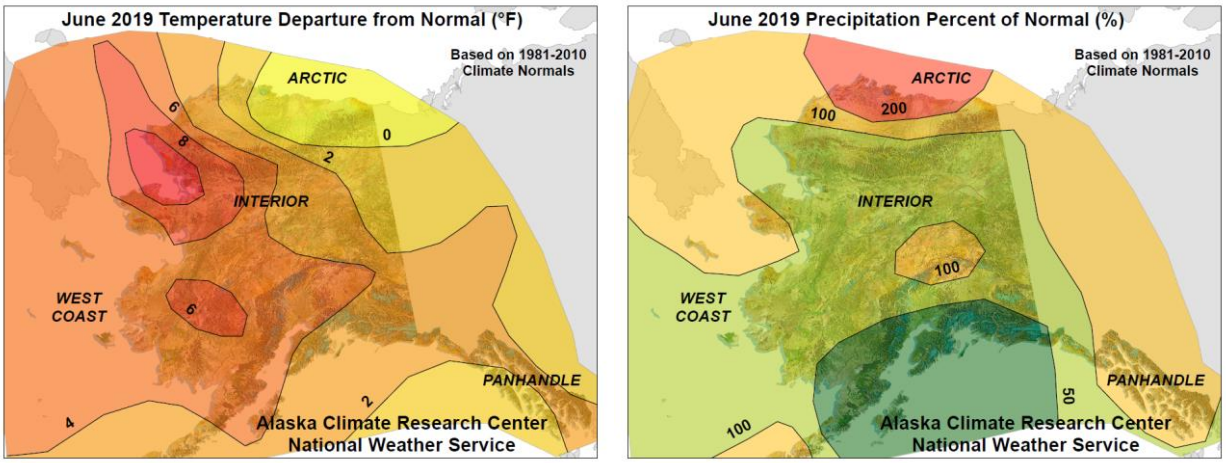
As was the case in April, temperatures across Alaska were quite warm in May, with the greatest departures from normal occurring again over the North Slope and along the west coast. Precipitation in May showed some trends that would continue through the summer: a surplus of precipitation along the North Slope and a deficit of rainfall over Southeast Alaska.



May 2019 Temperature Departure from normal (ºF) and Precipitation Percent of Normal

June

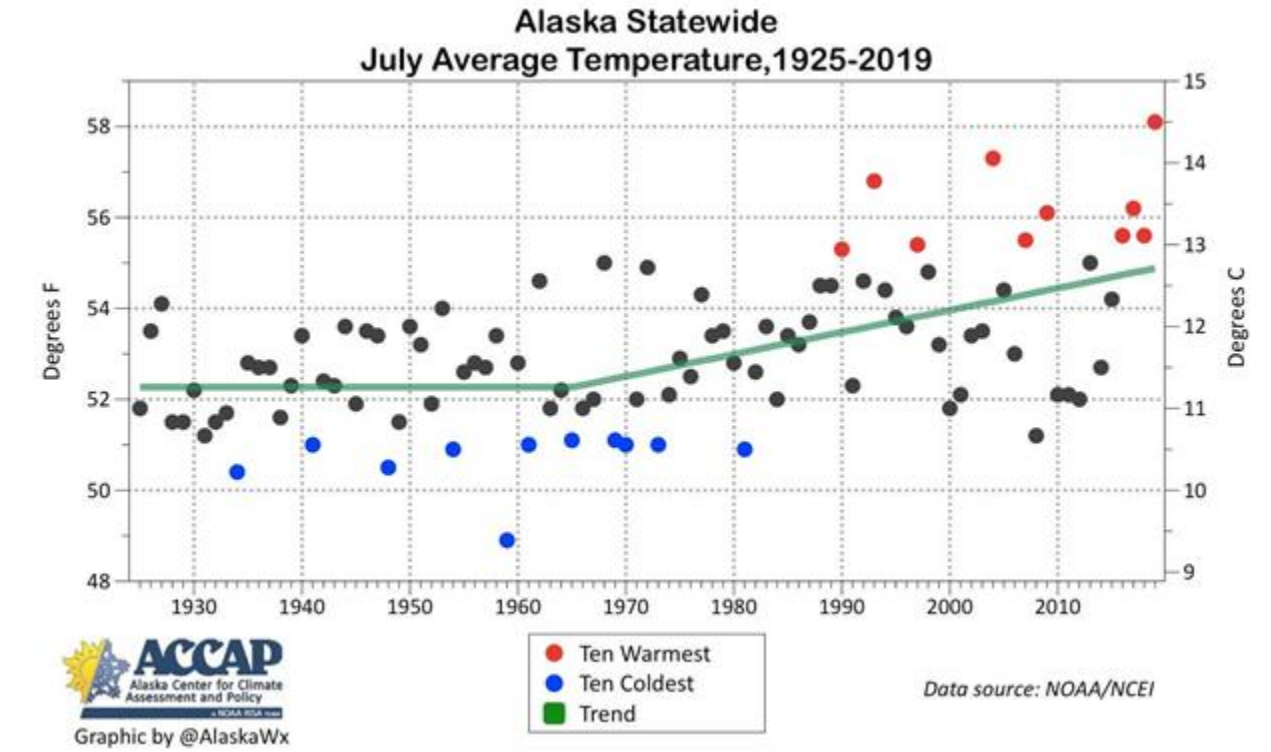
The warmth continued across much of the state in June, with Northway setting its all-time high temperature record of 92F on June 30th and Utkqiagvik reaching high of 73°F on June 20th, a record not only for that day but for all days in June. Kotzebue, Bettles, and Yakutat all set record high monthly temperatures for June.



June 2019 Temperature Departure from normal (ºF) and Precipitation Percent of Normal

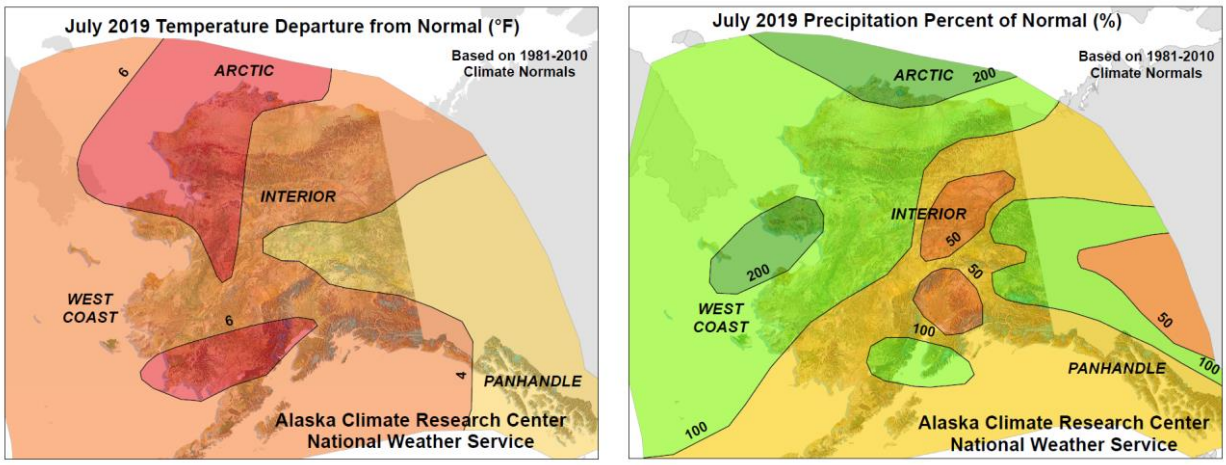
July

The heat persisted into July, with 2019 being the hottest July on record not only at several towns and villages but also, as shown in the graphic below, statewide. Numerous locations had their warmest month ever recorded. The temperature in Anchorage topped out at 90 degrees on the Fourth of July, setting a record not just for that day but for all days.



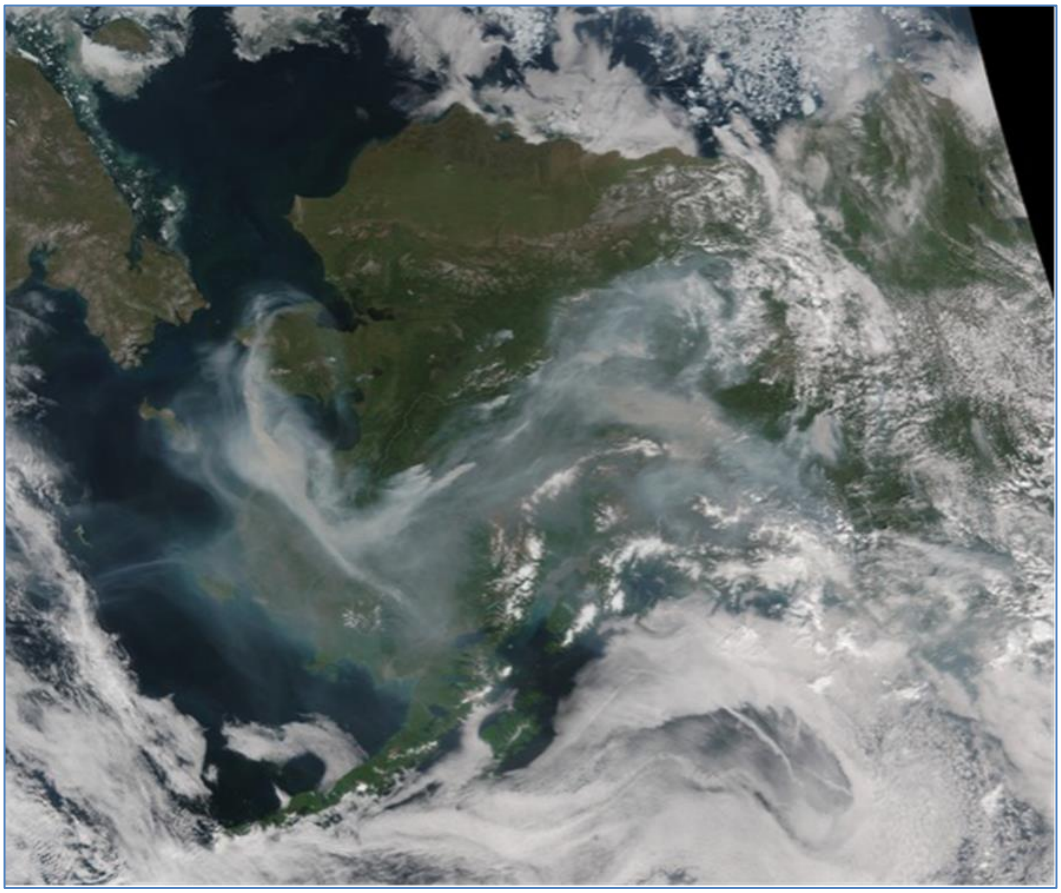
The North Slope, western, and southwest Alaska had the largest positive temperature departures from normal. Regarding precipitation, the North Slope and western Alaska received roughly double the normal

amount of rainfall during the month, while portions of South Central and the Interior had only about half the normal amount of rain.

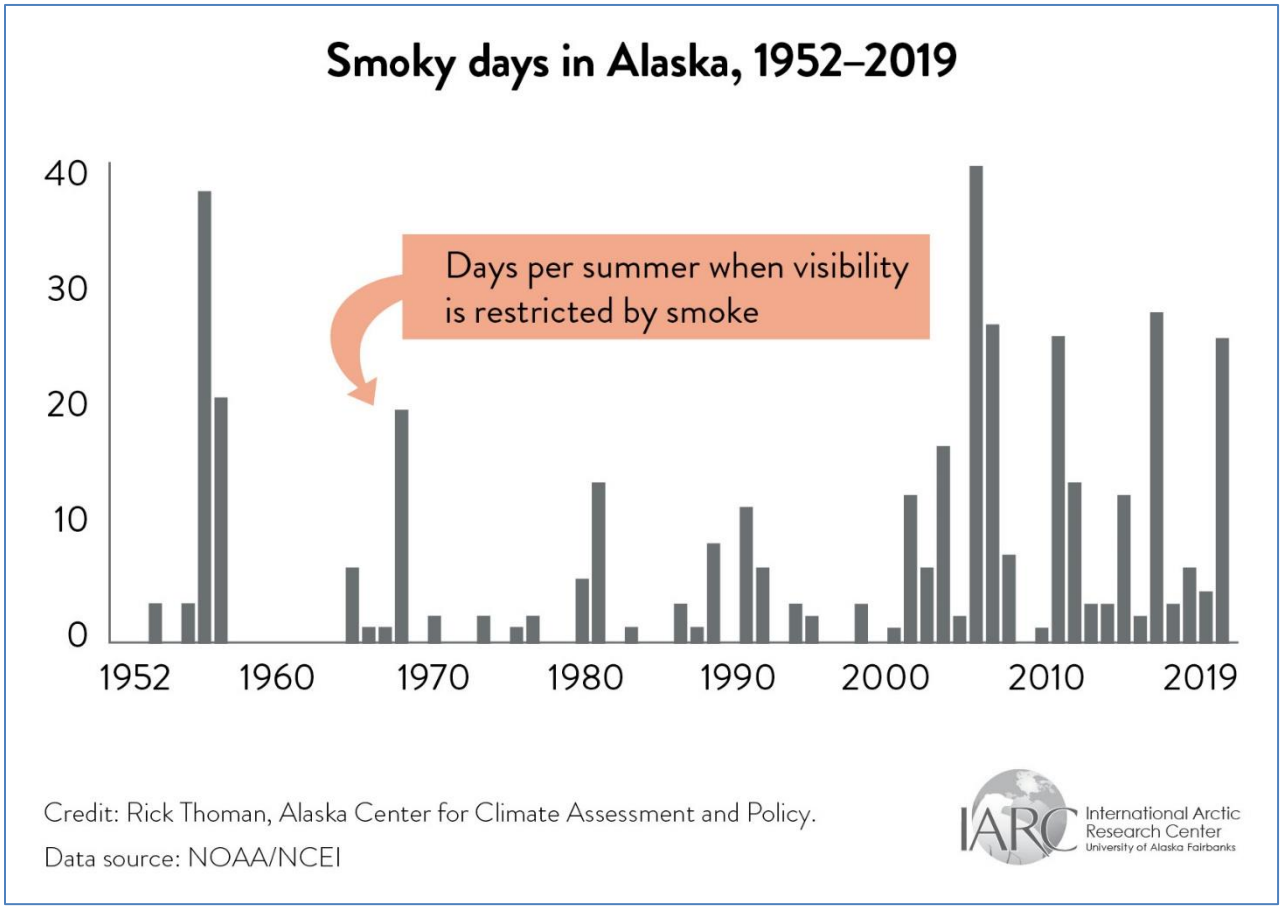


July 2019 Temperature Departure from normal (ºF) and Precipitation Percent of Normal

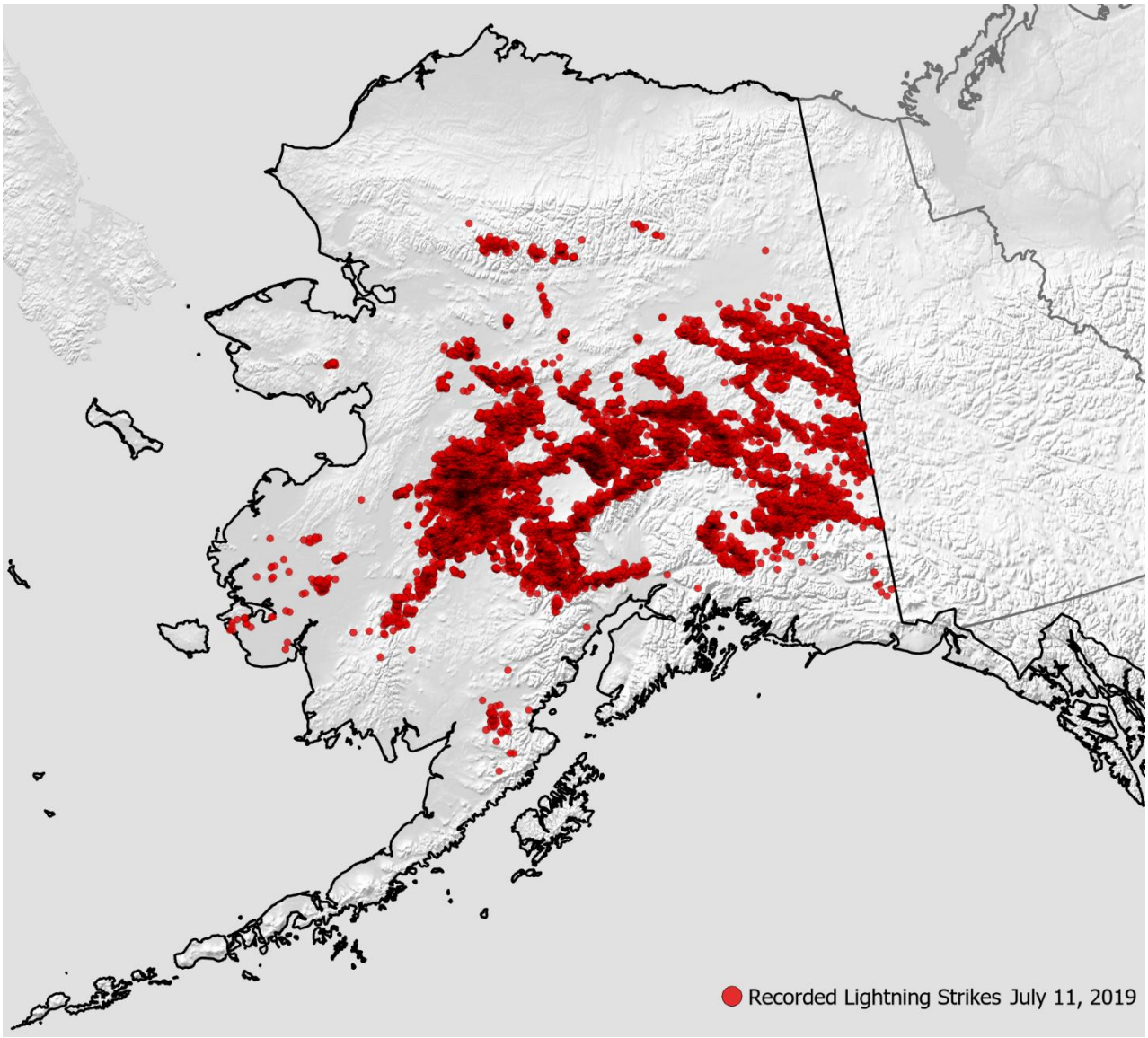
The satellite image below shows broad areas of smoke from numerous fires blanketing Interior and southwest Alaska on the afternoon of July 8th. The wispy gray swirls are smoke from wildfires. Brighter white areas represent clouds or glaciers.



There is a trend in recent decades toward an increasing number of smoky days in Alaska's Interior each season. Prior to 2004, Fairbanks had only one summer (1957) in the previous half century when there were more than three weeks of significant smoke. Since 2004, it has occurred five times, including twice since 2014.

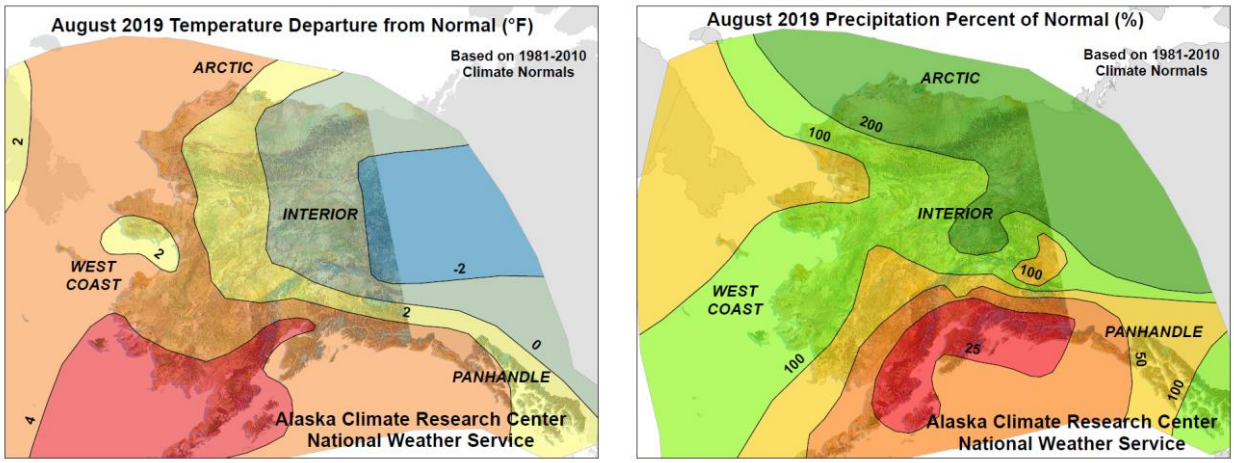


Thunderstorms are typically quite active over Alaska's Interior in June and July, and 2019 was no exception. The season's single biggest day for thunderstorm activity was July 11 when 25,157 strikes were recorded in Alaska, mostly over the southern Interior. The figure below shows how these lightnight strikes were distributed on July 11th. Wildfires started by lightning tend to account for the vast majority of the acres burned in a season, and in 2019 lightning-caused fires gobbled up 2,525,356 acres, while human-started fires only accounted for 60,269 acres.



August

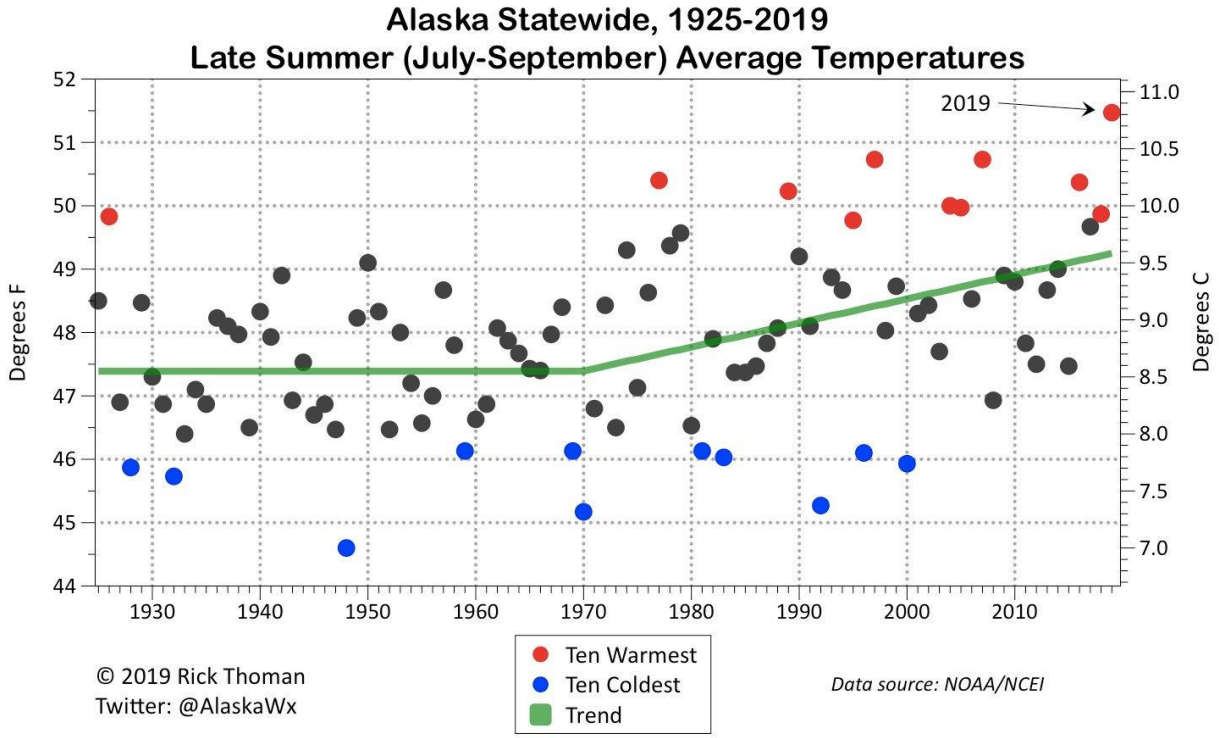
As is typical, Alaska's Interior received enough rainfall in August to tame down much of the fire activity north of the Alaska Range. Rainfall amounts were atypically high in some areas, as Denali Park had its wettest August of record with 9.53" of rain. But the story was very different south of the Alaska Range where hot and dry conditions persisted. Note the sharp gradient in the precipitation map at right below. Sitka had its driest August ever, and the southern Panhandle remained in a state of long-term drought. Fires remained very active south of the Alaska Range: the Swan Lake Fire on the Kenai Peninsula continued to grow, and the McKinley Fire in the Matanuska-Susitna Valley consumed over 50 structures.



August 2019 Temperature Departure from normal (°F) and Precipitation Percent of Normal

September

Alaska's trend for warm weather continued in September. Utqiagvik and Cold Bay, more than 1,100 miles from each other, both had the warmest September of record, and Yakutat had its warmest July through September of record. As shown in the figure below, Alaska as a whole also had its warmest July through September. Despite the continuing warmth, rainfall finally arrived over South Central Alaska in September, and day length continued to shorten and shrink the daily span of time when weather most favors increased fire activity. These factors finally led to the cessation of routine fire weather operations at the Alaska Interagency Coordination Center on September 20th.



Conclusion

The 2019 wildfire season will be remembered as very active across a broad span of the State. Of particular note is the persistent dry weather and associated ash pits and active wildfire behavior in South Central Alaska continuing so late into the season.

Contacts

This summary was put together by the Alaska Interagency Coordination Center Predictive Services meteorologists, Heidi Strader and Eric Stevens. Please contact them at 907-356-5691, or via email at hstrader@blm.gov and eric_stevens@nps.gov if you have questions about this document.