

2016 Fire Season Weather Summary

Summary

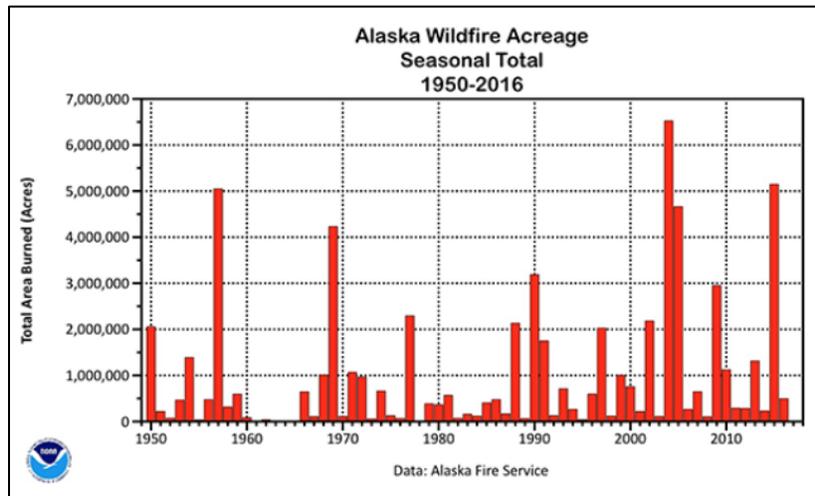
The summer of 2016 was memorable for its warm and wet weather, though those two variables did not necessarily occur at the same time, nor in the same place. Overall, the season felt fairly damp and slow to most firefighters. Despite the rainy feeling, there were some periods of dry weather and a lightning event in mid-July that started over 100 fires in the moderately dry Interior fuels.

The late winter period ranked as Alaska’s warmest January through March on record, and was nearly twelve degrees above the average for the 1900s. Precipitation was higher than normal along coastal areas, and below normal inland, though a good portion of the winter snowfall came as rain instead. The early season therefore started with a low snowpack and very warm temperatures, which led to a fairly dry late spring.

Despite the heightened concern for a busy early season, temperatures remained moderate, and lightning activity didn’t peak until after some June precipitation had come. This helped prevent significant fire activity through the period surrounding the solstice. It wasn’t until June 27th that the first lightning event brought a large number of ignitions. Rainfall a few days later helped keep conditions in check. The same thing happened over a three day period in mid-July, though fuels were quite dry after a bout of 80 and 90 degree days. Almost 70% of the summer acreage burned during that mid-July week of hot, dry weather.

Significant rains started at the end of July and were sporadic into August, which kept any additional acreage from accumulating very quickly. At the same time, much of southern Alaska was experiencing very warm temperatures: Anchorage saw its warmest summer and late summer ever.

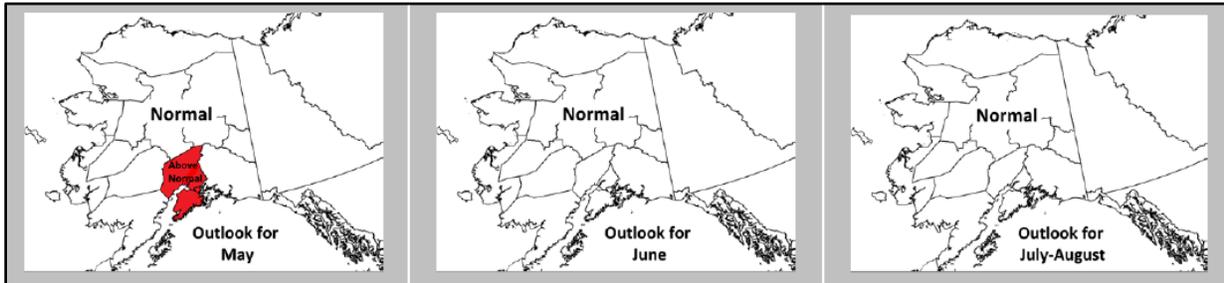
With roughly 500,000 acres burned, 2016 falls between the long term average and the median number of acres burned. Interestingly, this acreage is less than one tenth of what burned just last season, in 2015.



Alaska Wildfire Acreage by Season

Season Forecast

The fire potential outlook for the 2016 fire season was for above normal for the Matanuska and Susitna Valleys, as well as the Anchorage Bowl and Kenai Peninsula. Low snowpack and a warm, dry spring led to an early melt-out and concerns for extremely dry fuels to start the fire season. Long range forecasts indicated the likelihood of a warmer than normal summer. Long range precipitation forecasts have proven unreliable and thus don't enlighten the forecast. These factors led to forecast an above normal start to fire season, April and May, and then return to normal conditions by mid-June and into July. As there were no atmospheric factors to indicate anything extraordinary by mid-summer, a normal mid to late season was also forecasted.

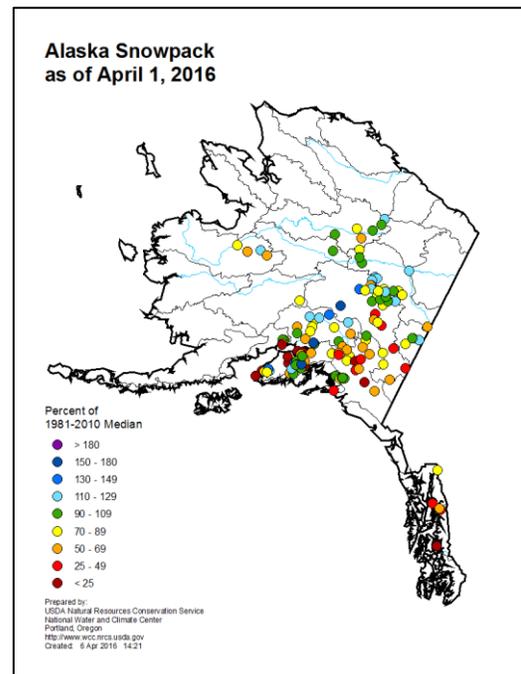


Spring 2016 Fire Season Outlook

Spring Snowpack

Once again, though precipitation totals were near normal for the winter, Southwest, South Central, and Southeast reported less than half their normal snowpack. Like the previous two years, much winter precipitation was rain instead of snow, likely running to low-lying areas and leaving much topography with a springtime moisture deficit. Farther north, conditions were closer to normal, though much of that snow fell early in the winter season.

The period from January through March was one of the warmest on record for much of Alaska, and spring continued warm: though almost a foot of snow fell across South Central on the first day of spring, record high temperatures on March 31st caused rapid snowmelt. The Fairbanks Airport saw one of its earliest melt-out dates on record, April 8th. By May 1st, all areas were observing below normal snowpack.

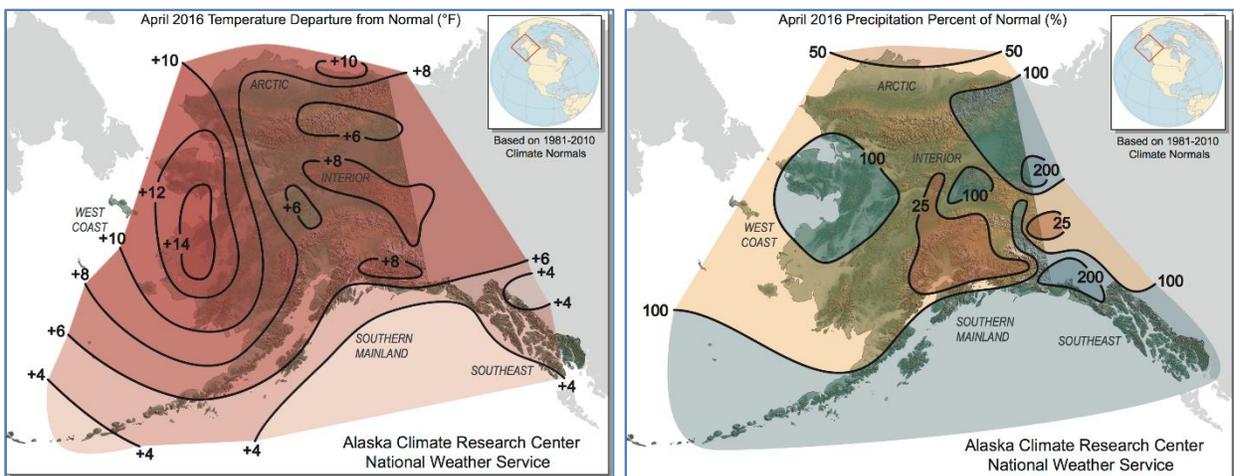


April

This was the warmest April on record for Alaska, with an average temperature of 33.3F, which is ten degrees above the 1925-2000 average! Temperatures were 5-8 degrees above normal for much of the mainland, and 12-14 degrees above normal on the west coast. Early river ice breakup was widespread on many Interior rivers once again, from Eagle to Nenana to Bethel.

Since April is generally the driest month for Alaska, normal precipitation amounts tend to be low. Observations showed it was a dry month, with the lowest amounts around South Central, where less than 25% of normal precipitation was observed. For most of the state, between 50 and 100% of normal were observed.

On April 17th, the first smokejumper response of the year was requested in the Matanuska Valley. This was the earliest that smokejumpers had ever been deployed to a fire in Alaska.



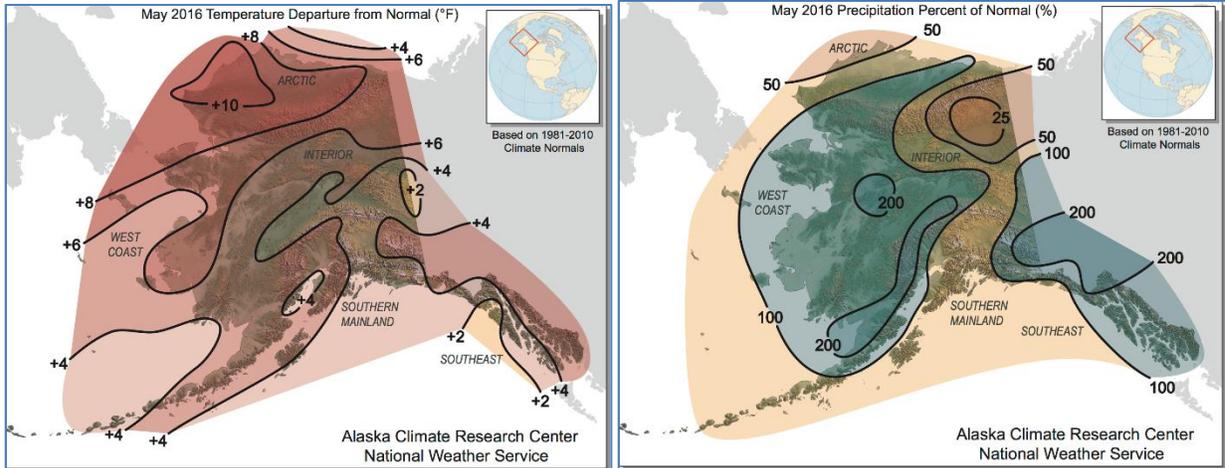
April 2016 Temperature Departure from normal (°F) and Precipitation Percent of Normal

May

May temperatures were well above normal for most of Alaska, with anomalies showing as much as ten degrees above normal over northwestern Alaska. The warmest May on record was observed at Barrow, Bethel, and Kotzebue, while the warmest spring on record (March through May) was observed in Juneau, Kodiak, King Salmon, Bethel, Anchorage, and Fairbanks. The average May temperatures for Barrow and Kotzebue exceeded normal by 8 to 10 degrees for the second year in a row, and a number of communities around the state had several daily high records during this time. These warm temperatures in the north led to an early season thunderstorm on May 24th just south of Barrow, with heavy rain, hail and lightning. The North Slope doesn't usually see this kind of convection until late July early August.

Meanwhile, after a week of record warm temperatures in the Interior, a light snow blanketed higher elevations in the eastern Interior, with even Tok seeing a half inch of snow on May 17th. This is one of the later Interior snowfalls on record.

Much of the state experienced well above normal precipitation for May. The exceptions were over the Upper Yukon Valley and eastern Brooks Range, as well as South Central, where conditions remained dry with less than half the normal amount of rainfall.

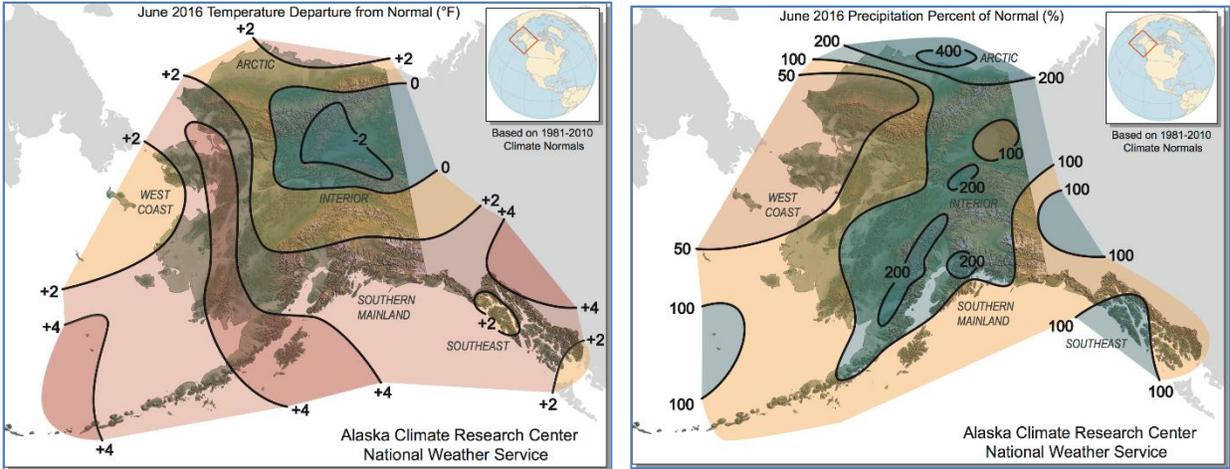


May 2016 Temperature Departure from normal (°F) and Precipitation Percent of Normal

June

June saw the transition from warm to wet for much of the eastern Interior, Southwest, and South Central. Both Anchorage and Fairbanks saw heavy rain events this month. On June 6th, the Anchorage area received about one inch of rain, which is the third greatest calendar day for June rain in that location. The Fairbanks airport saw 1.41 inches of rain in a 24 hour period June 11-12, which is the second highest 24-hr June rainfall on record. The Fairbanks rainfall was due to thunderstorms, which is typical of summertime precipitation in the Interior. The Anchorage rain was more widespread, though there were some convective cells imbedded in the system. Meanwhile, the northern coast cooled down enough for several inches of snow at Barrow on the 9th and 10th making this the snowiest June since 1981.

On June 17th, a fire started outside of Tetlin in the eastern Interior; it quickly became a threat to that community as it was fanned by hot, dry winds over the next few days. Fortunately, higher RHs and some rain helped firefighters get the blaze under control. There were also quite a few ignitions towards the end of the month, peaking at 37 new starts on June 26th. Many of these were due to lightning ignitions in dry fuels.



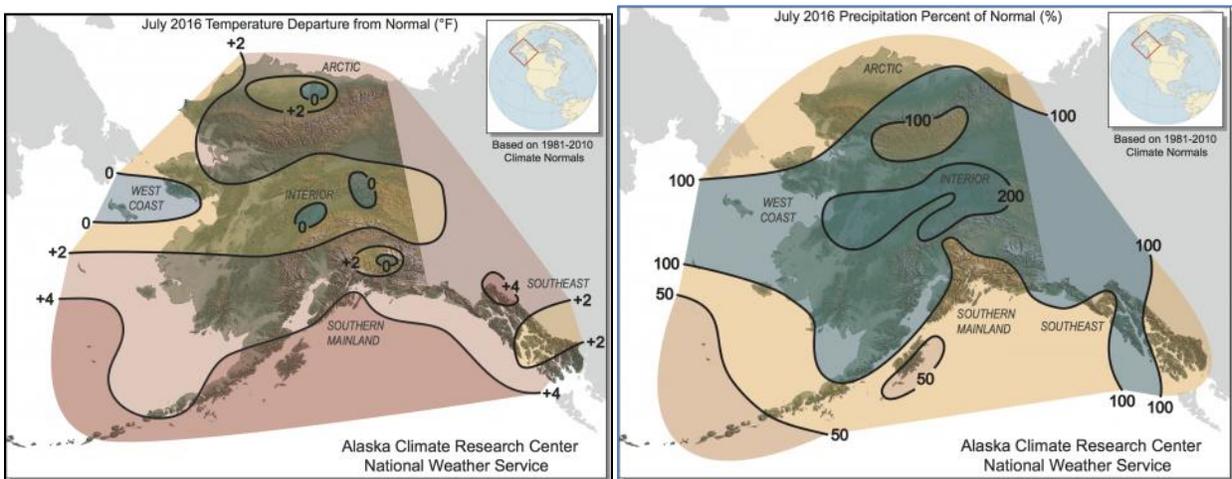
June 2016 Temperature Departure from normal (°F) and Precipitation Percent of Normal

July

The wet weather of June continued into July. The central Interior was quite wet, with the Fairbanks airport receiving 230% of its normal July rainfall. Remarkably, this was one of the lowest monthly totals in that part of the state. Eielson reported 7.6 inches, while many places in the hills around Fairbanks had between 10 and 15 inches of rain for the month, making this the wettest July on record in the central Interior. Denali Park experienced mud slides on the road, which stranded visitors and took several weeks to return to normal operations.

Meanwhile, South Central was having a warm summer, with Anchorage, Homer, Sitka, and Kenai all reporting their warmest July on record. Though overall temperatures were more moderate in the north, Prudhoe Bay on the north coast saw the warmest two days on record in that area on July 13th and 14th, reaching above 85 degrees. It is rare to have temperatures exceed 80 along the north coast. That hot weather on the north coast helped spur a thunderstorm at Barrow on the 13th, which was its first in three years.

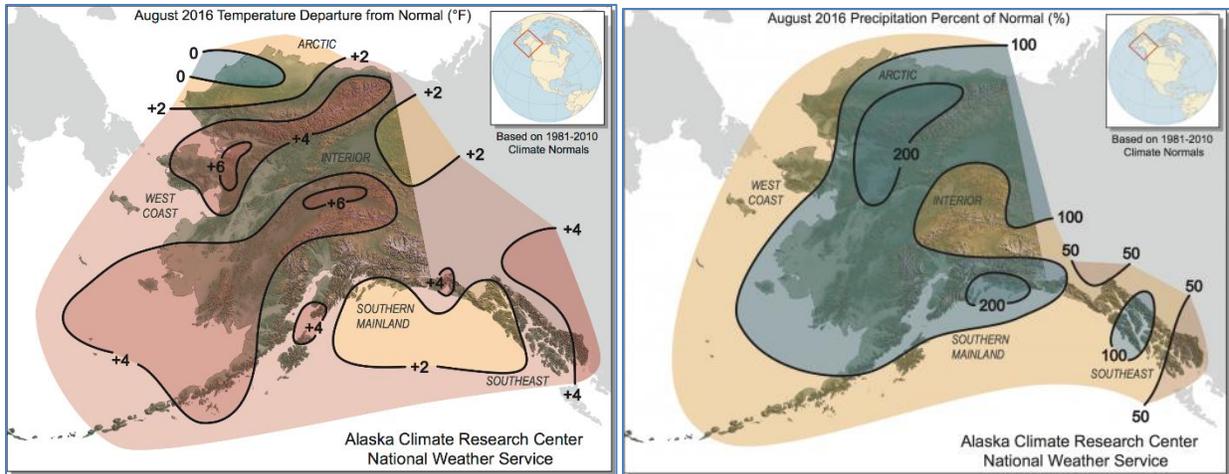
From July 13th to 15th, there were 114 new fire starts, mostly lightning ignitions. Temperatures in the 80s and 90s and RHs around 20%, combined with some big lightning days (~18,000 strikes on both July 14th and 15th) and gusty winds to exhaust Initial Attack resources. Fortunately, rain in the north came on July 17th and 18th, and then in the west on July 21st. Another wave of moisture followed a few days later. This widespread rain helped to slow activity and allowed time for firefighters to contain many fires.



July 2016 Temperature Departure from normal (°F) and Precipitation Percent of Normal

August

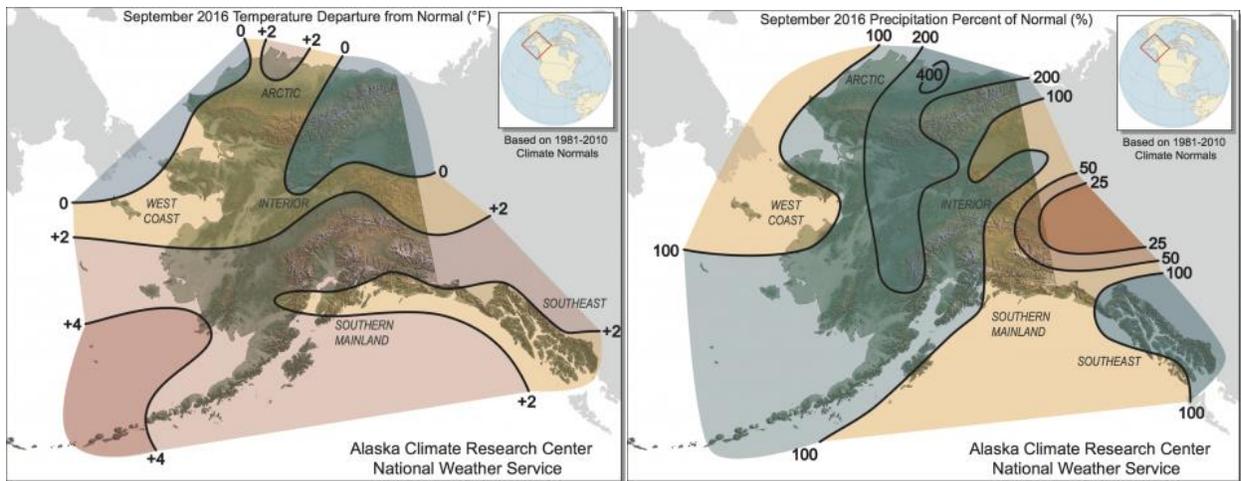
August seemed to start out as the typical late summer month it is. By the 10th, statewide rains came again, then periods of showers until more widespread precipitation around the 20th. Temperatures were gradually cooling and hovered around normal, until the last week of the month, when extreme warmth soared throughout southern Alaska, getting up into the mid and upper 70s in the southwest to set new records. Even the west and north coastal areas saw unseasonably warm weather. The highest late summer temperatures on record were observed at Kodiak, Homer, Cordova, King Salmon, Nome and Barrow. Anchorage and Kenai rounded out the season with their warmest summers (June-August) on record. Regardless, less than 10,000 acres burned in the whole month statewide.



August 2016 Temperature Departure from normal (°F) and Precipitation Percent of Normal

September

The hot weather from the end of August continued into the first few days of September for southern Alaska, then conditions moderated. Overall, this was a very wet month, with most areas exceeding their normal monthly precipitation. The Panhandle saw some brief flooding around the 13th due to short but intense rainfall. Meanwhile, wet conditions in the northern Interior had Bettles reporting its wettest September on record with 5.34 inches of precipitation, blowing away the previous record of 4.8 inches. Fire activity was minimal from September 1st through the end of the season.

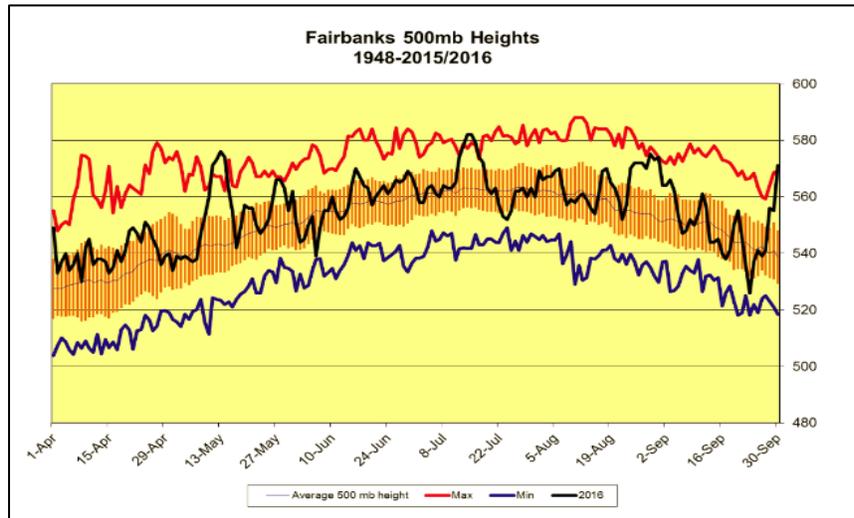


September 2016 Temperature Departure from normal (°F) and Precipitation Percent of Normal

500 mb Patterns:

Though this graph only shows 500 mb heights at Fairbanks, it's still a fairly representative snapshot of the 2016 fire season. The black line, representing 2016, shows two points during the season where the 500 mb heights actually exceeded the 67 year maximum value. The first of these was in mid-March, which correlates nicely with the time that some of those record to near-record temperatures were being observed across much of the state. The second new maximum is seen in mid-July, which matches nicely with those 80 and 90 degree days across the Interior that culminated in a three-day lightning event and led to most of

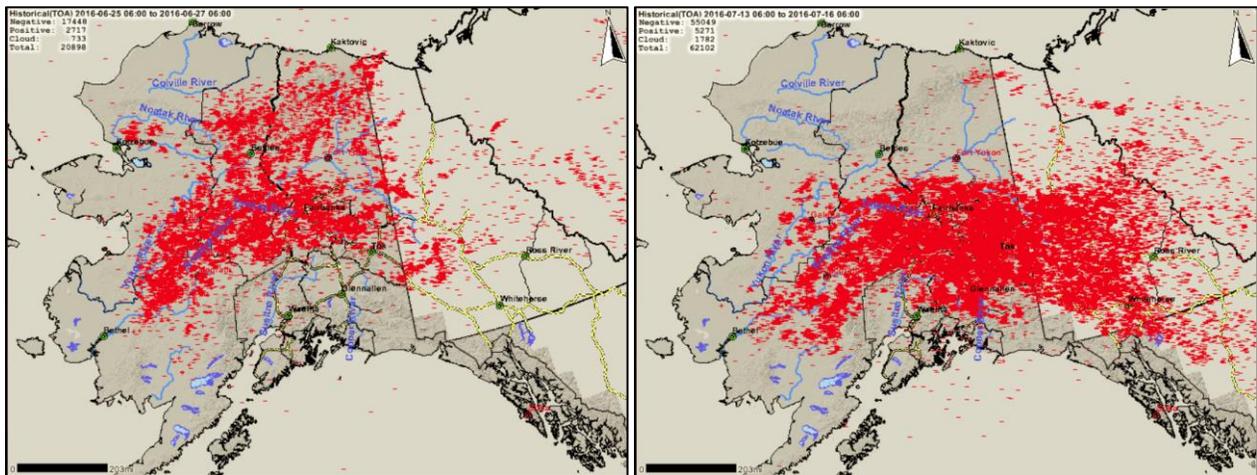
the burned acreage for the entire season. Most of the rest of the season, the 500 mb heights were in the average zone, which was consistent with the rather quiet fire season.



2016 500 mb Heights for Fairbanks compared with 67-year database

Lightning

Though it seems there has been a lot of improvement since it was installed in 2012, the Alaska Lightning Detection System, ALDS, continues to pose some challenges. At times, the system reports strikes in places that are cloud-free, and other times it misses strikes associated with thunderstorm cells, where lightning is observed by the naked eye. Reported errors were significantly fewer than the last few years, but will continue to be documented and investigated. Sensors have all been upgraded since 2014, and outfitted with the latest software.

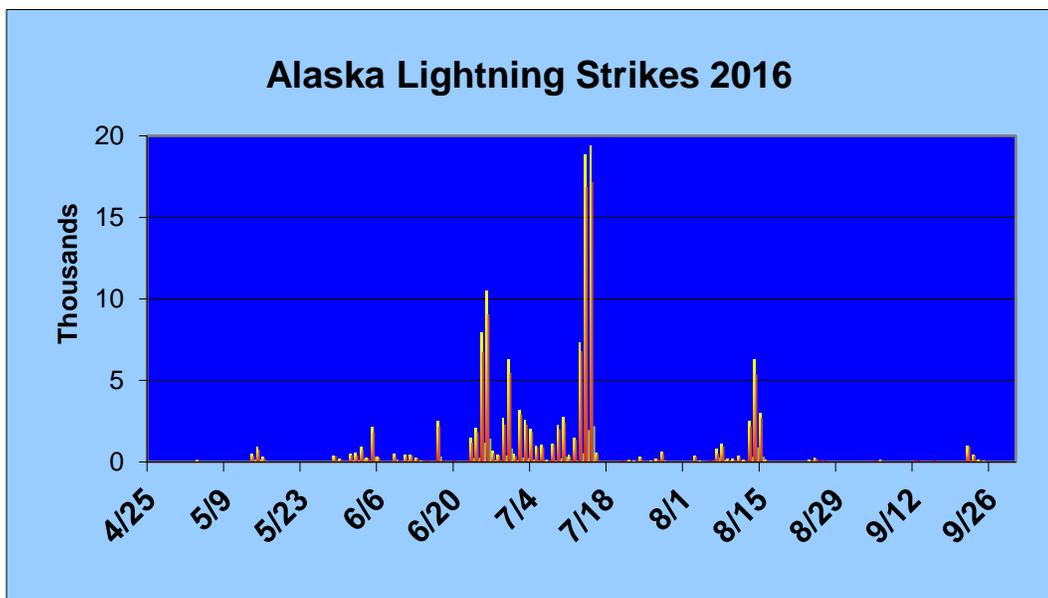


Lightning Strikes in Alaska from 6/25-26/2016, and 7/13-15/2016

2016 saw a brief spell of lightning activity around mid-May, amounting to about 1500 strikes over a three day period. Then conditions were relatively quiet, with only a couple of days reporting over 2000 strikes into the end of June. It was June 25th and 26th when the first large scale lightning event occurred, with over 18,000

strikes reported on each of two days, with a focus on the Interior and central and eastern Brooks Range. This led to more than 55 fire starts in the dry early summer fuels during that two day period. The next two weeks saw several days with more than 2000 strikes, then another event, this time over three days from July 13th through 15th, which brought 45,500 lightning strikes to Alaska, mainly over the southern Interior and Copper River Basin. After several days of 80 and 90 degree weather, this lightning kicked off more than one hundred starts during that three day period. Over that week in mid-July, almost ¾ of the total acreage for the season burned, emphasizing how fuels and weather combine to determine the level of fire activity. The rest of the season saw fairly minimal lightning activity with only one other burst in the thousands about a month later, in mid- August.

Keep in mind that direct comparisons to previous years are difficult due to periodic upgrades to the system. Regardless, 125,199 observed strikes is one of the highest summer lightning totals on record for Alaska. Despite this high number of strikes, the 2016 fire season did not turn out to be nearly as spectacular as the year before, when 135,424 strikes helped fuel the second busiest fire season, burning more than five million acres.



Lightning Strikes in Alaska for 2016 Fire Season

Conclusion

2016 will be remembered as a fairly wet, but warm fire season. Coming off the second biggest fire season in Alaska’s history, 2016 seemed pretty slow at best. However, there were some dry periods that, when combined with lightning, reminded us that it doesn’t take a whole summer of hot, dry weather to get some very intense activity.

Contacts

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