



**Alaska Climate Research Center**  
**Alaska State Climate Center**



# **STATEWIDE CLIMATE SUMMARY AUGUST 2021**

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**A**laska’s Statewide Climate Summary for August 2021 provides an overview of weather for the month based on data from selected weather stations throughout the state. “Departure from normal” refers to the climatological average over the 1991-2020 normal period. Here, we report on temperature, precipitation and drought conditions in the state, as well as the condition of the Arctic sea ice.

## HIGHLIGHTS

At the beginning of the month, **new high temperature records** were set, most notably in Fairbanks with a record high of 89 °F.

Overall, average temperatures were **cooler than usual** for the month for most of the state.

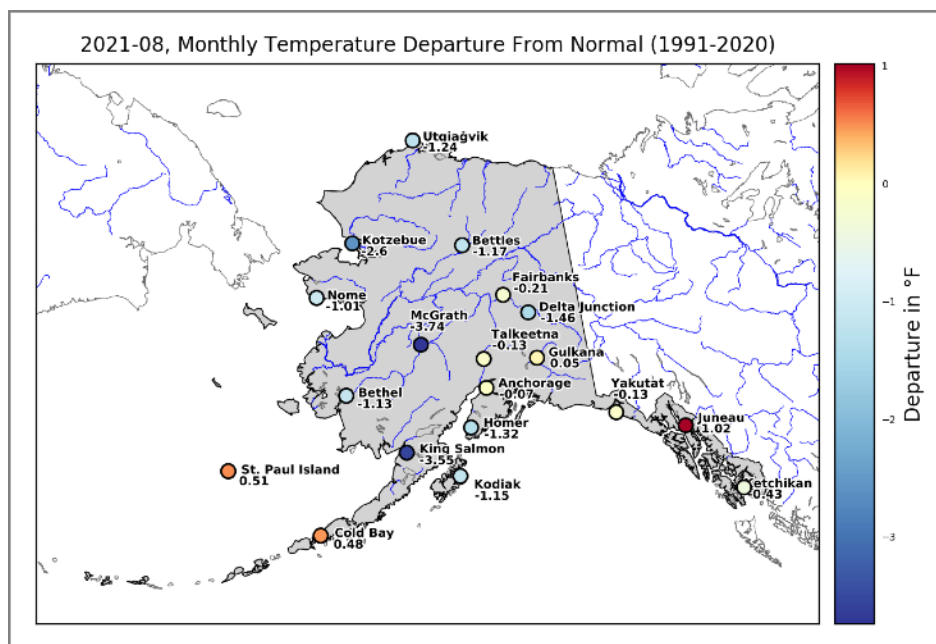
**Significant precipitation** was recorded across the Interior of the State and the Panhandle.

Significant precipitation, including snowfall in the Brooks Range, effectively led to the **end of the wildfire season**.

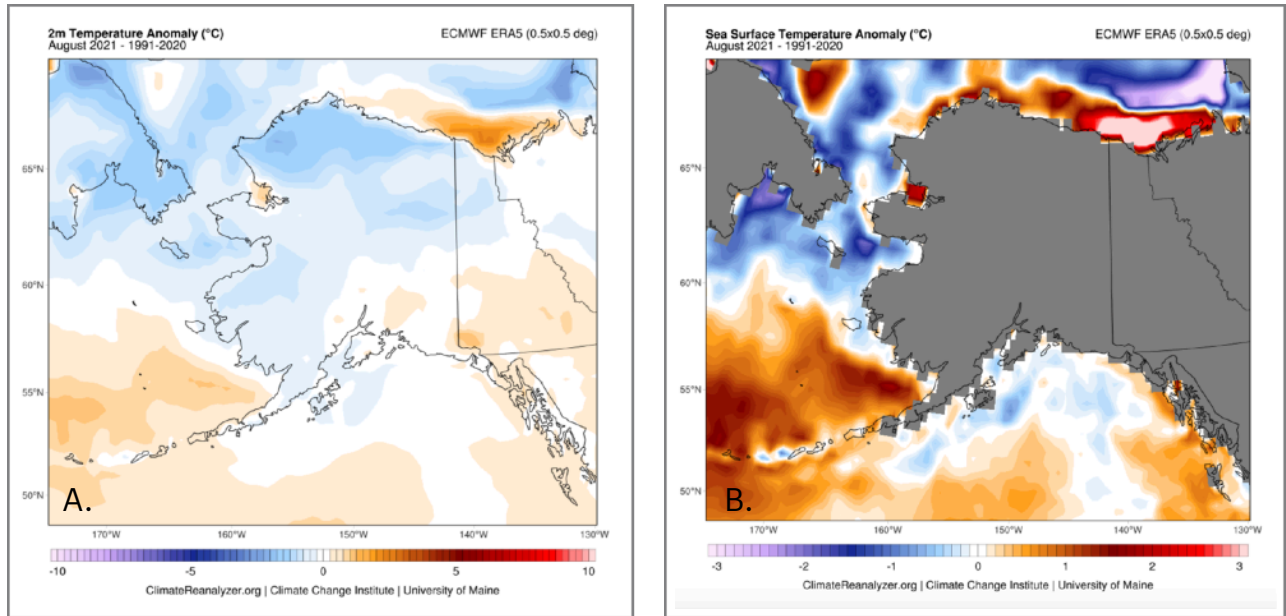
**Much slower decline in Arctic sea ice extent** was observed for the month due to low pressure area over the Beaufort Sea, keeping temperatures low.

## Temperature

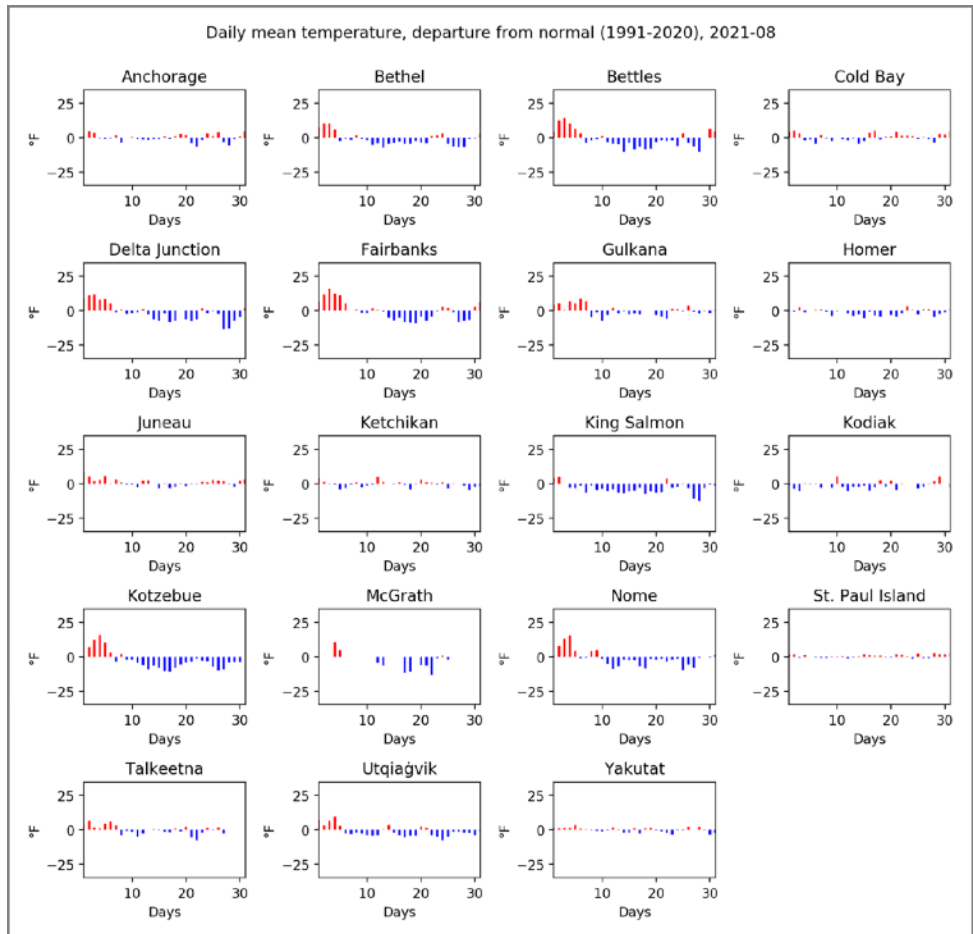
Much cooler than normal temperatures persisted in the state during the month of August, with 14 out of 18 first-order stations observing average monthly temperatures below the climatological mean. The most significant departures include King Salmon (-3.5 °F) and Kotzebue (-2.6 °F). Warmer than usual temperatures were found in Juneau (+1.0 °F), St. Paul Island (+0.5 °F) and Cold Bay (+0.5 °F), as seen in Figure 1 and Table 1. Figure 2A shows ERA-5 gridded temperature anomalies for the month of August 2021 compared to the long-term climatological mean, while Figure 2B shows the sea surface temperature anomalies. Note the warmer than usual temperatures in the southern Bering Sea and Bristol Bay, as well as along the southern Panhandle, up into Juneau. Figure 3 shows the daily mean temperature departures for all the first-order stations, where it is clear that warmer than usual temperatures persisted in the beginning of the month for the interior part of the state. Despite the average cooler temperatures for August, several new high temperature records were broken at the beginning of the month, with the more notable ones including a maximum high of 85 °F in Gulkana on August 2, breaking the previous record set back in 1909; along with a maximum high of 80 °F in Kotzebue on August 4, breaking a previous record set in 1902. On August 3, Fairbanks set a new maximum daily temperature record with an astounding 89 °F temperature. Several low records were also broken,



**Figure 1.** Monthly mean temperature departure from normal, August 2021, for selected stations around the state of Alaska.



**Figure 2.** (A) ERA-5 gridded temperature anomalies for the month of August 2021 compared to the long-term climatological mean; (B) ERA-5 gridded sea surface temperature anomalies for the month of August 2021 compared to the long-term climatological mean (source: Climate Reanalyzer, University of Maine).



**Figure 3.** Daily mean temperature departures for each day in August 2021 at the selected stations.

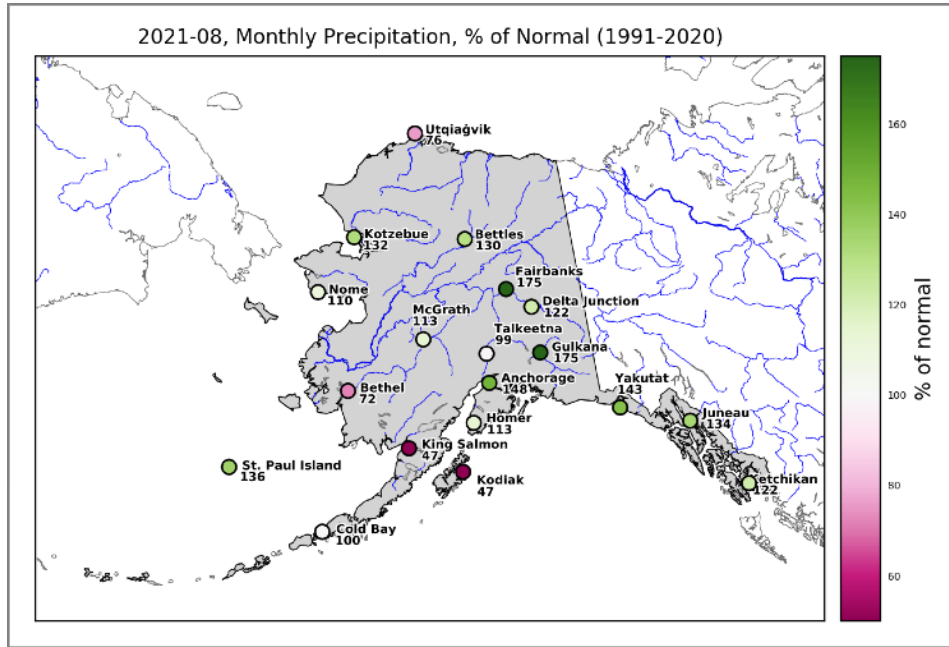
Station	Observed (°F)	Normal (°F)	Departure (°F)
Anchorage	57.4	57.5	-0.1
Bethel	52.8	53.9	-1.1
Bettles	51.6	52.6	-1.2
Cold Bay	53.1	52.7	0.5
Delta Junction	54.2	55.6	-1.5
Fairbanks	56.8	57.0	-0.2
Gulkana	53.6	53.5	0.05
Homer	54.0	55.3	-1.3
Juneau	57.0	56.0	1.0
Ketchikan	58.6	59.0	-0.4
King Salmon	52.1	55.7	-3.5
Kodiak	55.4	56.5	-1.1
Kotzebue	49.5	52.2	-2.6
Nome	49.2	50.2	-1.0
St. Paul Island	50.1	49.6	0.5
Talkeetna	56.9	56.5	-0.1
Utqiagvik	38.6	39.8	-1.2
Yakutat	54.5	54.6	-0.1

**Table 1.** Mean monthly air temperature, normal (1991-2020) and departure for selected stations throughout the state, August 2021. Color-coded to Figure 1 (yellow-orange-red = warmer than usual; shades of blue = cooler than usual).

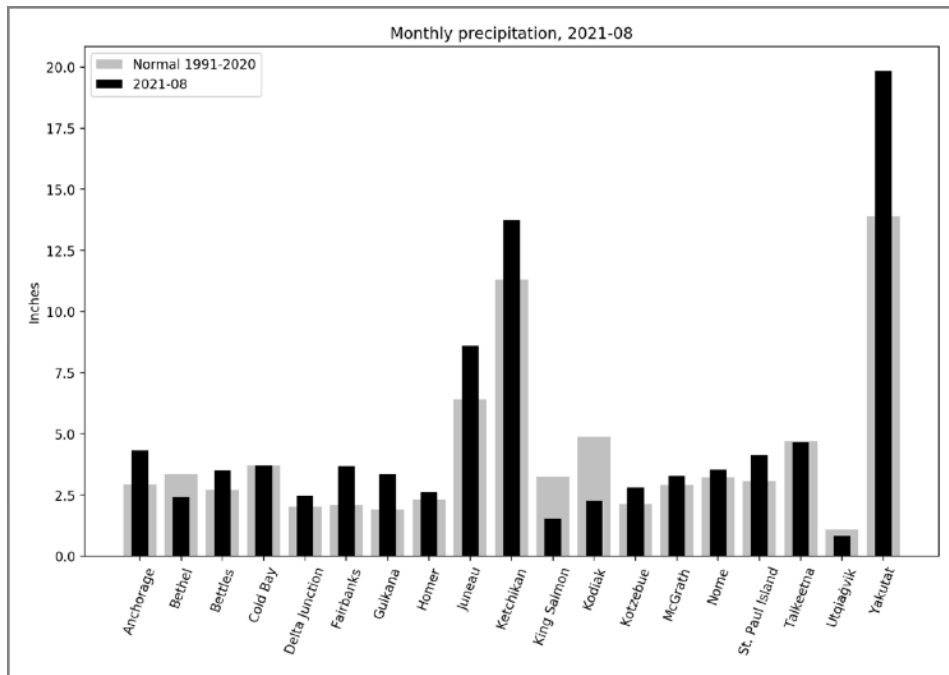
with a notable one including Gulkana’s lowest minimum daily temperature record of 27 °F set on August 22, breaking a previous record set in 1917.

## Precipitation

Except for the Bristol Bay Area, the Cook Inlet and small regions of the North Slope, most of Alaska saw significantly more precipitation than usual for the month. Notable departures include Fairbanks, receiving 175% of normal; Gulkana, receiving 175% of normal; Anchorage receiving 148% of normal, and Yakutat, Juneau and Ketchikan all



**Figure 4.** Monthly mean precipitation departure from normal (in percent), August 2021, for selected stations around the state of Alaska.



**Figure 5.** Monthly precipitation sums for August 2021 at the selected stations compared to the normal (1991-2020), in inches.

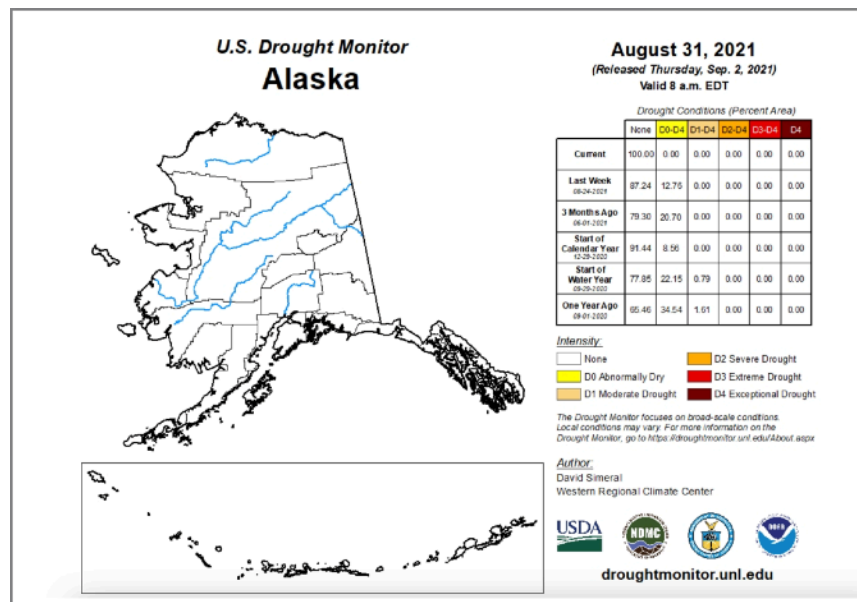
receiving above 100% of normal. On August 11, the Panhandle endured heavy rain due to the presence of an atmospheric river aimed at the Northeast Gulf Coast. In the middle of the month (August 15 - 17), the Brooks Range in the northern part of the state experienced a few inches of snowfall. Drier than usual conditions prevailed in Bristol Bay, with King Salmon and Kodiak receiving less than half (47%) of their normal precipitation (Figure 4; Table 2). Figure 5 shows the monthly precipitation sums for August 2021 at the selected stations compared to the normal (1991-2020), in inches.

Station	Precipitation (in)	Normal (in)	% of Normal
Anchorage	4.3	2.9	148.1
Bethel	2.4	3.4	72.0
Bettles	3.5	2.7	129.5
Cold Bay	3.7	3.7	100.3
Delta Junction	2.4	2.0	120.3
Fairbanks	3.7	2.1	174.8
Gulkana	3.4	1.9	175.9
Homer	2.6	2.3	113.4
Juneau	8.6	6.4	134.5
Ketchikan	13.8	11.3	121.8
King Salmon	1.5	3.3	47.2
Kodiak	2.3	4.9	46.5
Kotzebue	2.8	2.1	131.9
McGrath	1.2	2.9	39.5
Nome	3.5	3.2	110.2
St. Paul Island	4.1	3.1	135.6
Talkeetna	4.7	4.7	99.1
Utqiagvik	0.8	1.1	76.1
Yakutat	19.8	13.9	142.7

**Table 2.** Monthly precipitation sum, normal (1991-2020) and departure expressed as a percentage of the normal (1991-2020) for selected stations throughout the state, August 2021. Shades of purple and green correlate with Figure 4.

## Drought

The U.S. drought monitor did not show any drought conditions for the month of August across the state of Alaska. This is consistent with the high amounts of precipitation that fell during this timeframe. Figure 6 has been produced through a collaboration of the USDA, NOAA and the National Drought Mitigation Center.



**Figure 6:** U.S. Drought Monitor map for Alaska, updated on August 31, 2021. The table on the right shows the percent area affected by different categories of drought intensity. Figures and data produced and released by the U.S. Drought Monitor, a partnership between the National Drought Mitigation Center at the University of Nebraska-Lincoln, the United States Department of Agriculture, and the National Oceanic and Atmospheric Administration (<https://droughtmonitor.unl.edu>).

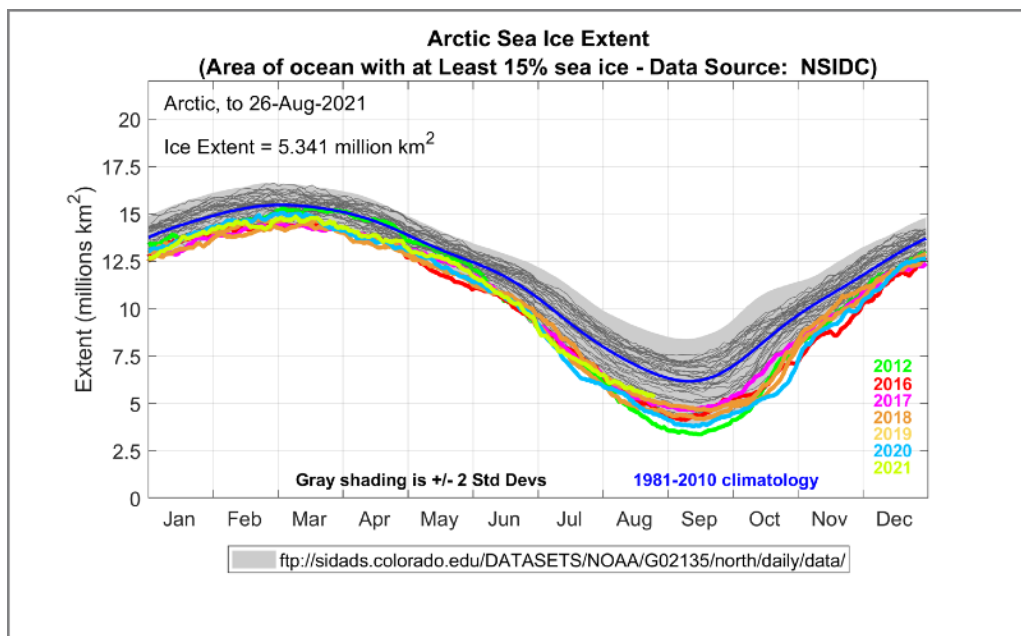
## Wildfire Activity

A shift from a hot/dry to a cool/wet pattern across the Interior early in the month dampened wildfire activity and brought the wildfire season to a close. As of August 31, 2021, the year-to-date fires totaled 373, with 255,081 acres burned. The majority (235) were human-caused, with 127 caused by lightning and 11 with undetermined causes. 21 active fires were in “monitor” status, meaning that the fire activity is periodically monitored and allowed to burn, but kept in monitor status until reports confirm that the fire is out. Please check our UAFSmoke website at <http://smoke.alaska.edu> for updated fire information. UAFSmoke shows current wildfire status information and up to 72 hours forecast of concentration of black carbon and particulate matter included in wildfire smoke.

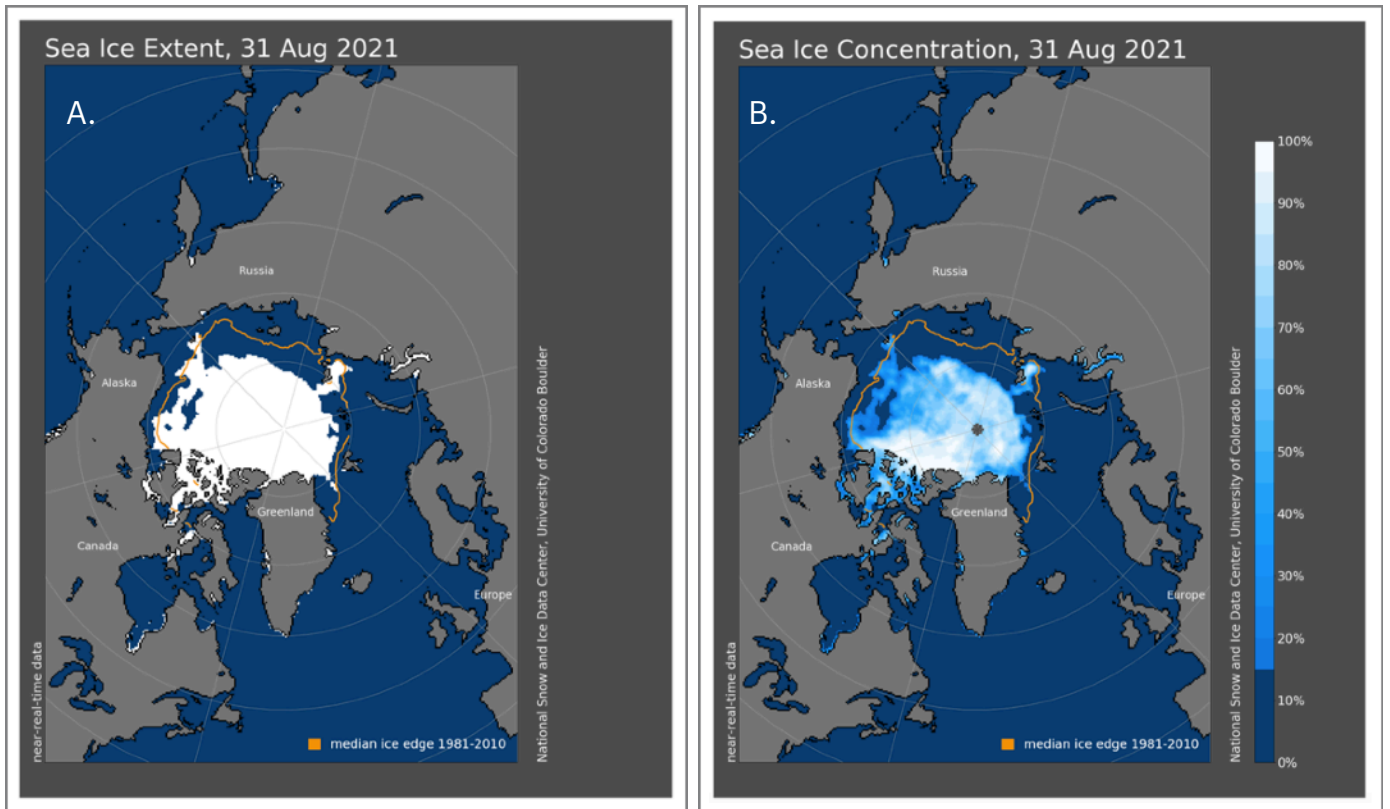
### Arctic Sea Ice

August 2021 saw a much slower decline in Arctic sea ice extent than in the past decade - most likely September 2021's minimum extent will be among the highest in the last decade. Part of the reason for this was a persistent low-pressure area in the Beaufort Sea, dispersing the ice and keeping temperatures low. The average extent for the month ranks 10th lowest in the passive microwave satellite record.

Figure 7 shows the time series for 2021 of daily Arctic sea ice extent, up to August 26, 2021, while Figures 8A,B show the sea ice extent and concentration for the month of August 2021, compared with the average from 1981 – 2010.



**Figure 7.** Time series of daily Arctic sea ice extent. This year's data (lime green) are updated until August 26, 2021. The median sea ice extent for the 1981-2010 reference period is depicted in blue. Specific years are highlighted in colors. Plot Compiled by: Howard J. Diamond, PhD; Climate Science Program Manager at NOAA's Air Resources Laboratory Data Source: National Snow & Ice Data Center (<https://nsidc.org/>).



**Figure 8.** (A) Sea ice extent and (B) sea ice concentration as of August 31, 2021, and as compared with the 1981 - 2010 median edge. Images: National Snow and Ice Data Center ([nsidc.org](http://nsidc.org)).

## Newsworthy Information

### ***Climate change threatens seal hunting by Indigenous Alaskans***

Climate change has severely reduced the length of the seal hunting season in a rural Alaska village, potentially threatening a key feature of the community's Indigenous way of life.

<https://uaf.edu/news/climate-change-threatens-seal-hunting-by-Indigenous-Alaskans.php>





Sea ice gathers near Cape Lisburne off Alaska's northwest coast in 2011. Less sea ice and the amount of heat it has introduced into the north has affected Alaskans from Utqiagvik, where the local climate has changed to resemble that of a Scandinavian coastal city, to Fairbanks, where our above-zero winter seems more like Anchorage.

Photo by Ned Rozell

### **State of the Climate Report: 2020 was warmest year on record for the Arctic**

The American Meteorological Society released its annual State of the Climate report for 2020 on Wednesday, August 25. Overall, the main takeaway of the report is that the Earth is warming...

[https://www.newsminer.com/news/alaska\\_news/state-of-the-climate-report-2020-was-warmest-year-on-record-for-arctic/article\\_4b83a2c8-06a4-11ec-b427-ffdc0afa5b55.html](https://www.newsminer.com/news/alaska_news/state-of-the-climate-report-2020-was-warmest-year-on-record-for-arctic/article_4b83a2c8-06a4-11ec-b427-ffdc0afa5b55.html)

### **As UAF's Geophysical Institute celebrates 75 years in existence, here's how it got there**

A workplace for volcanologists, glaciologists, seismologists, aurora-ologists and other types of scientists, the Geophysical Institute at the University of Alaska Fairbanks has endured since the 1940s. Why?

<https://www.adn.com/alaska-news/science/2021/08/28/as-uafs-geophysical-institute-celebrates-75-years-in-existence-heres-how-it-got-there/>



The Eivey Building (with the satellite dish on top), home to the Geophysical Institute on the UAF campus. (Photo by Ned Rozell)

## Appendix

**Table A1:** August 2021 daily records of mean daily temperature, i.e. highest/lowest values of mean daily temperature ever recorded on specific days. Records are computed since the beginning of the respective time series. Seven new records were set for highest mean daily temperatures was set and one for lowest mean daily temperature record.

<b>Highest Mean Daily Temperature on Record</b>				
<b>Station</b>	<b>Date</b>	<b>New Record (°F)</b>	<b>Year of Old Record</b>	<b>Old Record (°F)</b>
Bettles	2021-08-02	69.0	1974	68.0
Bettles	2021-08-03	70.5	1985	67.0
Fairbanks	2021-08-02	72.5	2010	71.5
Fairbanks	2021-08-03	76.5	1994	69.0
Kotzebue	2021-08-03	66.0	1977	65.5
Kotzebue	2021-08-04	70.0	1985	65.5
Nome	2021-08-04	66.5	1972	64.0

<b>Lowest Mean Daily Temperature on Record</b>				
<b>Station</b>	<b>Date</b>	<b>New Record (°F)</b>	<b>Year of Old Record</b>	<b>Old Record (°F)</b>
King Salmon	2021-08-28	41.5	1960	42.5

**Table A2:** August 2021 daily records of maximum daily temperature, i.e. highest/lowest values of maximum daily temperature ever recorded on specific days. Records are computed since the beginning of the respective time series. Six new highest maximum daily temperature records were set and two were set for lowest maximum daily temperature records.

<b>Highest Maximum Daily Temperature Record</b>				
<b>Station</b>	<b>Date</b>	<b>New Record (°F)</b>	<b>Year of Old Record</b>	<b>Old Record (°F)</b>
Bettles	2021-08-03	85.0	1974	82.0
Fairbanks	2021-08-02	88.0	1962	83.0
Fairbanks	2021-08-03	89.0	1994	83.0
Gulkana	2021-08-02	85.0	1909	83.0
Kotzebue	2021-08-04	80.0	1902	73.0
Nome	2021-08-04	79.0	2002	74.0

<b>Lowest Maximum Daily Temperature Record</b>				
<b>Station</b>	<b>Date</b>	<b>New Record (°F)</b>	<b>Year of Old Record</b>	<b>Old Record (°F)</b>
Bettles	2021-08-16	47.0	1998	48.0
Gulkana	2021-08-10	50.0	1955	52.0

**Table A3:** August 2021 daily records of minimum daily temperature, i.e. highest/lowest values of minimum daily temperature ever recorded on specific days. Records are computed since the beginning of the respective time series. Eight new records for highest minimum daily temperatures were set and five new records for lowest minimum daily temperature.

<b>Highest Minimum Daily Temperature on Record</b>				
<b>Station</b>	<b>Date</b>	<b>New Record (°F)</b>	<b>Year of Old Record</b>	<b>Old Record (°F)</b>
Anchorage	2021-08-03	59.0	1994	58.0
Bettles	2021-08-03	56.0	1997	55.0
Fairbanks	2021-08-03	64.0	1984	61.0
Fairbanks	2021-08-06	63.0	1978	60.0
Fairbanks	2021-08-24	54.0	1963	53.0
Juneau	2021-08-02	57.0	2018	55.0

Kotzebue	2021-08-04	60.0	1977	59.0
Talkeetna	2021-08-07	57.0	1999	56.0

<b>Lowest Minimum Daily Temperature on Record</b>				
<b>Station</b>	<b>Date</b>	<b>New Record (°F)</b>	<b>Year of Old Record</b>	<b>Old Record (°F)</b>
Cold Bay	2021-08-14	39.0	1969	40.0
Gulkana	2021-08-22	27.0	1917	28.0
King Salmon	2021-08-27	32.0	1984	33.0
King Salmon	2021-08-28	26.0	1960	31.0
Nome	2021-08-12	31.0	1929	33.0

*This information consists of climatological data compiled by the Alaska Climate Research Center, Geophysical Institute, University of Alaska Fairbanks. For more information on weather and climatology, visit the center website at <http://akclimate.org>. Please report any comments, ideas or errors to [webmaster@akclimate.org](mailto:webmaster@akclimate.org).*