



Alaska Statewide Climate Summary

June 2020

JUNE 2020 HIGHLIGHTS

- **WARM JUNE OVER MUCH OF THE SOUTHWESTERN AND WESTERN PORTIONS OF ALASKA.**
- **ST. PAUL ISLAND SET NEW MEAN DAILY TEMPERATURE RECORDS FOR MULTIPLE DAYS OF THE MONTH, WITH ONE DAY SURPASSING THE PREVIOUS RECORD BY 4 °F, SET JUST IN 2019.**
- **ST. PAUL ISLAND RECEIVED NO PRECIPITATION FOR THE MONTH OF JUNE.**
- **FAIRBANKS AND KETCHIKAN BROKE PREVIOUS PRECIPITATION RECORDS SET IN 1962 AND 1988.**
- **SEA ICE EXTENT NOTABLY BELOW AVERAGE IN THE BARENTS AND CHUKCHI SEAS, BUT LESS SO THAN IN RECENT YEARS.**
- **TOTAL ARCTIC SEA ICE EXTENT LEVELS ARE EVEN WITH ALL-TIME 2012 RECORD LOW FOR THIS TIME OF YEAR.**

The following report provides an overview of the June weather. The report is based on data from selected weather stations throughout the state of Alaska. “Departure from normal” refers to the climatological average over the 1981-2010 period.

Temperature

Temperatures across Alaska were warmer than average for over half of the locations reporting data (68%) and colder than average for the rest (Figure 1; Table 1). For the latter (warmer), these include the coastal regions, with the warmest along the southwestern coast. For the former (colder) regions, this includes the interior of the state. St. Paul Island (+6.6 °F), Nome (+3.3 °F) and Cold Bay (+2.9 °F) reported the highest (warm) departures from normal while Gulkana (-1.8 °F), Delta Junction (-1.4 °F) and Juneau (-1.2 °F) reported the highest (cold) departures from normal. See Figure 2 for more detail on St. Paul Island, which showed the largest departures from normal during the month of June, as well as throughout the year 2020.

Highest mean daily records were broken on multiple dates at St. Paul Island: on June 3rd increasing 0.5 °F from the previous record of 48 °F set in 1979; on June 8th increasing 1.0 °F from the previous record of 46.5 °F set in 2016; on June 18th increasing 1.0 °F from the previous record of 51 °F set in 2019; on June 19th increasing 1.0 °F from the previous record of 47.5 °F set in 1996; on June 20th increasing 4.0 °F from the previous record of 49 °F set in 2019; on June 21st increasing 2.0 °F from the previous record set in 2019; and on June 23rd increasing 1.0 °F from the previous record set in 1983. The lowest minimum daily record was broken in Delta Junction on June 22nd from 50°F in 1919 to 49 °F in 2020. All other values (e.g., highest minimum and maximum daily) and dates are listed in Tables A1, A2 and A3 in the appendix.

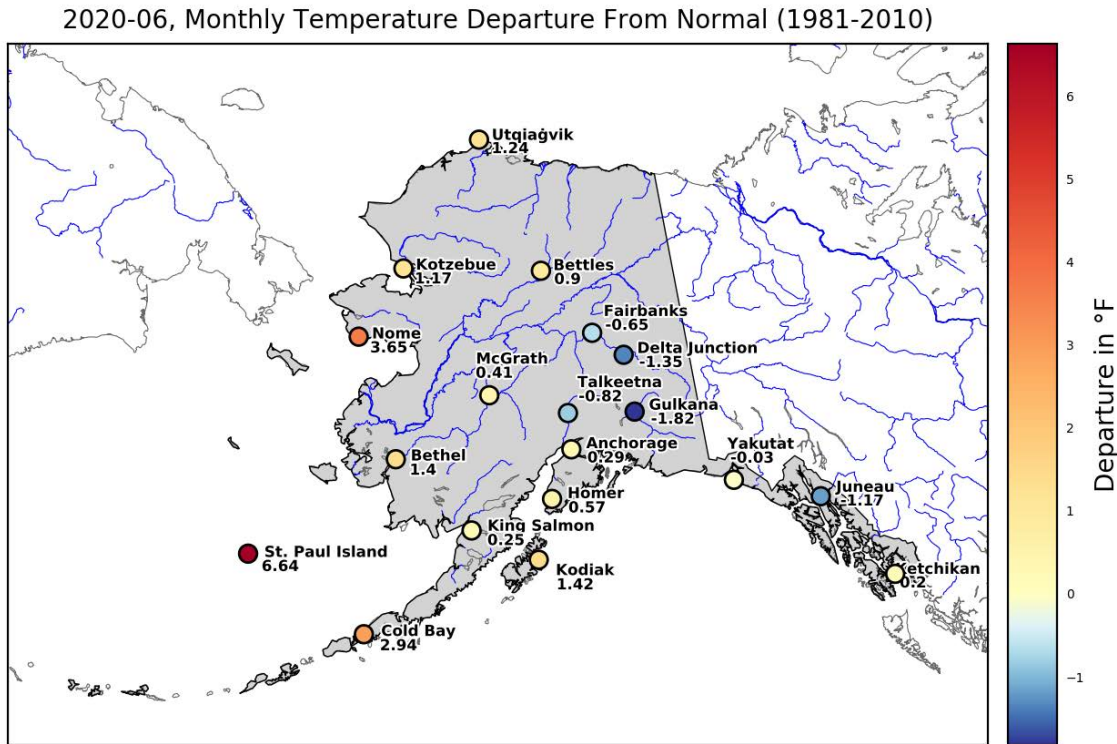


Figure 1: Monthly mean temperature departure from normal, June 2020.

Table 1: Mean monthly air temperature, normal (1981-2010) and departure for selected stations throughout the state, June 2020. Red is above average; blue is below average.

| <u>Station</u> | <u>Observed (°F)</u> | <u>Normal (°F)</u> | <u>Departure (°F)</u> |
|----------------|----------------------|--------------------|-----------------------|
| Anchorage | 55.5 | 55.2 | 0.3 |
| Bethel | 53.8 | 52.4 | 1.4 |
| Bettles | 59.4 | 58.4 | 0.9 |
| Cold Bay | 49.2 | 46.3 | 2.9 |
| Delta Junction | 56.2 | 57.6 | -1.4 |
| Fairbanks | 59.8 | 60.5 | -0.7 |
| Gulkana | 52.5 | 54.4 | -1.8 |

| | | | |
|-----------------|------|------|------|
| Homer | 51.2 | 50.6 | 0.6 |
| Juneau | 53.4 | 54.6 | -1.2 |
| Ketchikan | 54.2 | 54.0 | 0.2 |
| King Salmon | 51.7 | 51.5 | 0.2 |
| Kodiak | 51.1 | 49.7 | 1.4 |
| Kotzebue | 46.9 | 45.7 | 1.2 |
| McGrath | 57.8 | 57.4 | 0.4 |
| Nome | 51.4 | 47.8 | 3.6 |
| St. Paul Island | 48.3 | 42.4 | 6.6 |
| Talkeetna | 56.2 | 57.1 | -0.8 |
| Utqiagvik | 36.9 | 35.6 | 1.2 |
| Yakutat | 50.8 | 50.8 | 0.0 |

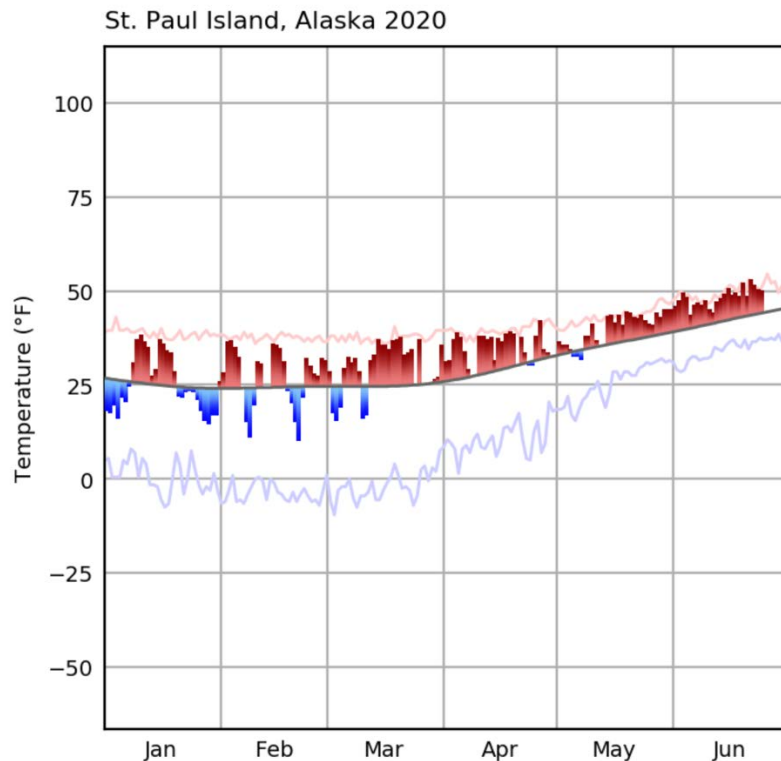


Figure 2: St. Paul Island daily mean temperature departures from normal (1981-2010) in 2020. Red and blue bars represent positive and negative temperature departures. Grey line represents the mean normal temperature, red and blue lines represent respectively the historic highest and lowest records of mean daily temperature. Note the majority above average temperatures from the start of the year – present, with highest departures consistently in June 2020.

Daily mean temperature departures (Figure 3) show above average temperatures for the majority of days in July for Bettles, Cold Bay, Kodiak, McGrath, Nome, and St. Paul Island, with St. Paul

Island showing the greatest consistently high temperatures throughout the month of June. Gulkana shows below average temperatures for the majority of days in June.

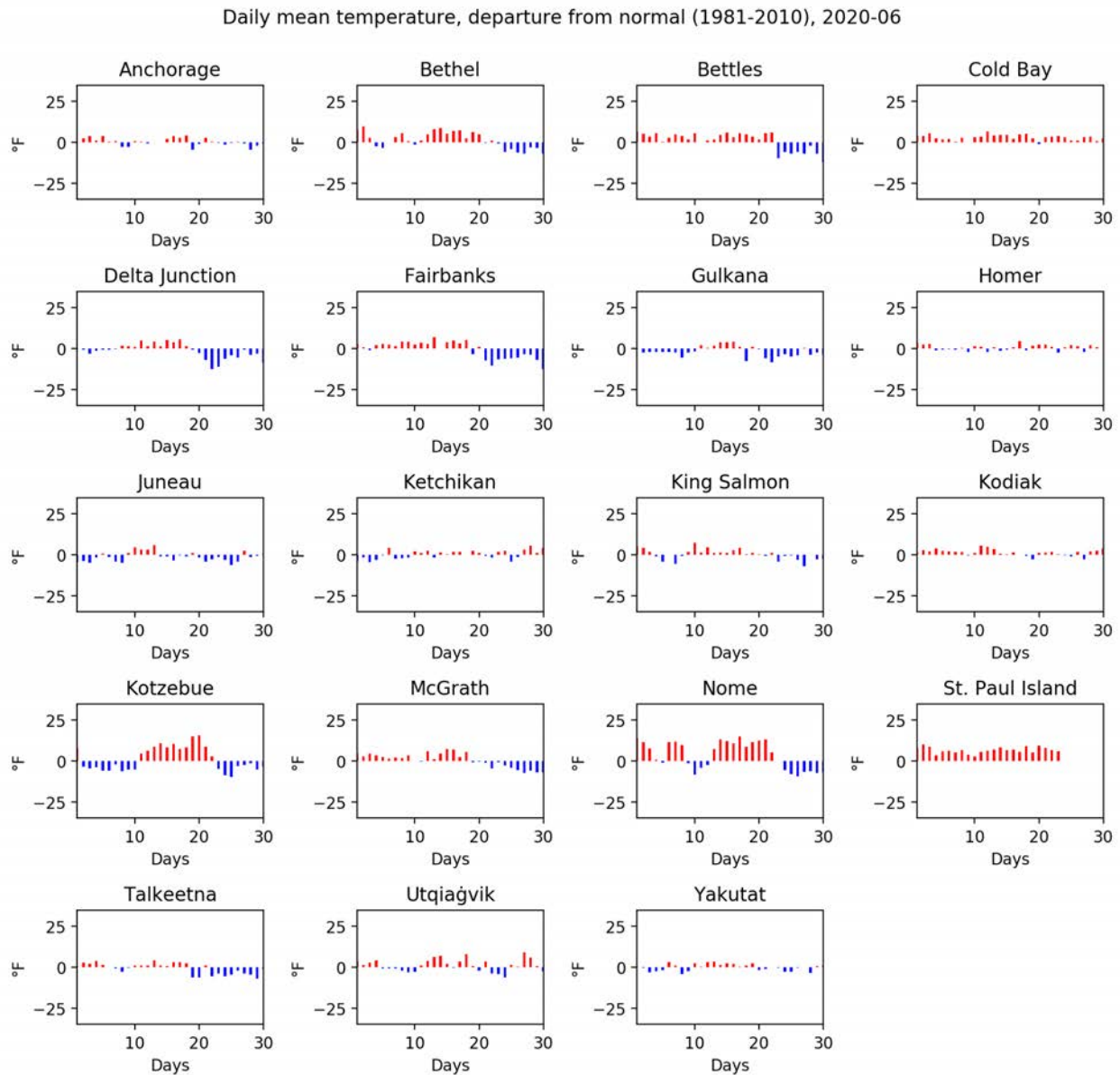


Figure 3: Daily mean temperature departures for each day in June 2020, at the selected stations.

Precipitation

Precipitation in June was nearly evenly split between above-average and below-average amounts (Figure 4). Noteworthy is that for areas receiving above-average precipitation, the amounts far exceeded 100%. Areas receiving the most rain include Delta Junction (5.1 inches, or, 221.6% of normal; Fairbanks (3.1 inches, or, 225.5% of normal); Gulkana (2.2 inches, or, 153.6% of normal); Juneau (7.3 inches, or, 225.3% of normal); Ketchikan (13.7 inches, or, 207% of normal); and

McGrath (3 inches, or, 200% of normal). Areas receiving the least rain include Homer (0.2 inches, or, 28% of normal) and St. Paul Island, which received no precipitation for the month (Table 2).

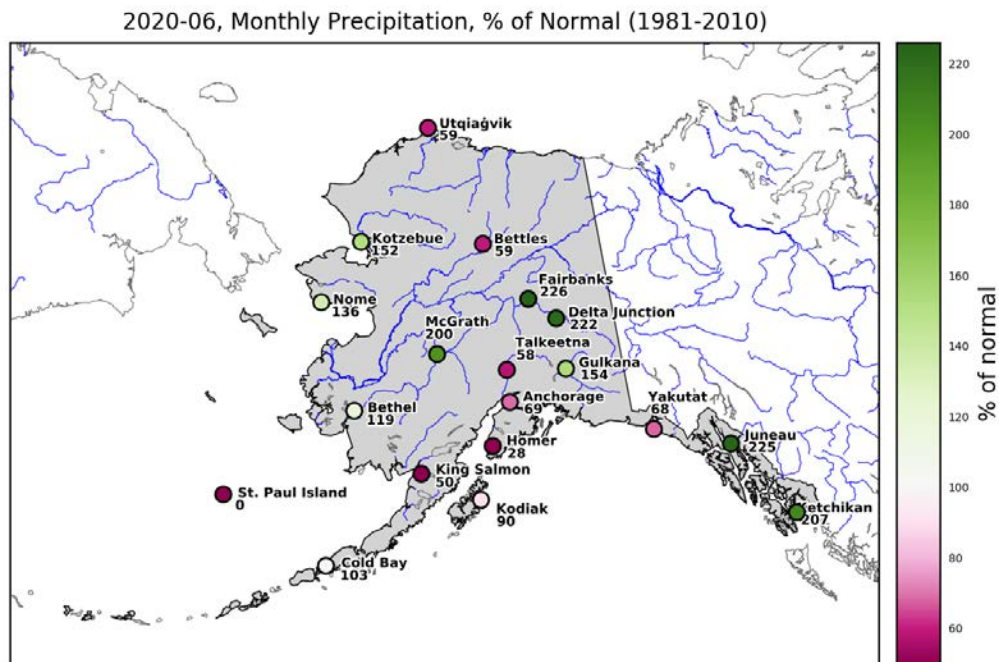


Figure 4: Monthly precipitation sums expressed as percent of normal (1981-2010), June 2020.

Table 2: Monthly precipitation sum, normal (1981-2010) and departure expressed as a percentage of the normal (1981-2010) for selected stations throughout the state, June 2020.

| Station | Precipitation (in) | Normal (in) | % of normal |
|----------------|--------------------|-------------|-------------|
| Anchorage | 0.7 | 1.0 | 69.1 |
| Bethel | 2.1 | 1.7 | 119.2 |
| Bettles | 0.8 | 1.4 | 59.3 |
| Cold Bay | 2.8 | 2.7 | 103.3 |
| Delta Junction | 5.1 | 2.3 | 221.6 |
| Fairbanks | 3.1 | 1.4 | 225.5 |
| Gulkana | 2.2 | 1.4 | 153.6 |
| Homer | 0.2 | 0.8 | 28.0 |
| Juneau | 7.3 | 3.2 | 225.3 |
| Ketchikan | 13.7 | 6.6 | 207.0 |
| King Salmon | 0.8 | 1.7 | 49.7 |
| Kodiak | 5.3 | 5.9 | 90.0 |
| Kotzebue | 0.9 | 0.6 | 151.7 |
| McGrath | 3.0 | 1.5 | 200.0 |
| Nome | 1.3 | 1.0 | 135.7 |

| | | | |
|-----------------|-----|-----|------|
| St. Paul Island | 0.0 | 1.4 | 0.0 |
| Talkeetna | 1.1 | 1.9 | 57.8 |
| Utqiagvik | 0.2 | 0.3 | 59.4 |
| Yakutat | 4.4 | 6.4 | 68.1 |

Notably, Delta Junction, Fairbanks, Juneau and Ketchikan received significantly more precipitation than normal (Figures 4, 5) while Bettles, Homer, King Salmon, Talkeetna and Yakutat received significantly less. Overall, St. Paul Island received the least for the month: zero precipitation. Note that St. Paul Island also experienced above-average temperatures for the month.

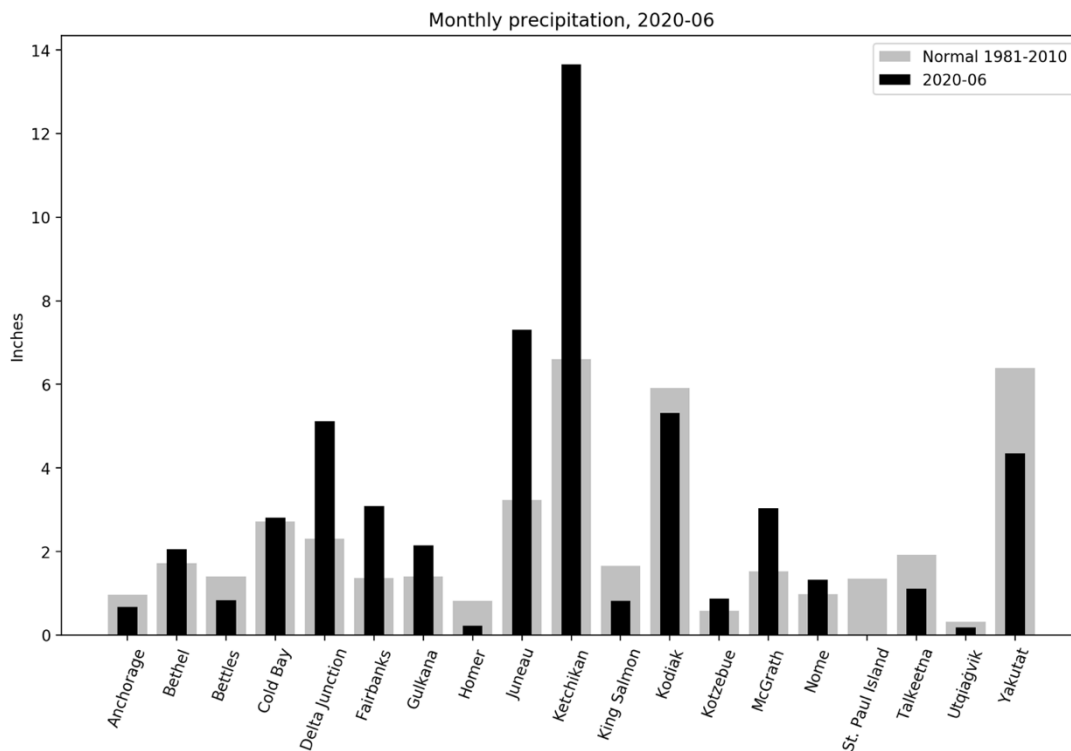


Figure 5: Monthly precipitation sums for June 2020 at the selected stations compared to the normal (1981-2010), in inches.

Drought Conditions

Despite below normal precipitation in some areas (e.g., St. Paul Island), Alaska as a whole was free of abnormal dryness and drought conditions through June 2020. Figure 6 has been produced through a collaboration of the USDA, NOAA and the National Drought Mitigation Center.

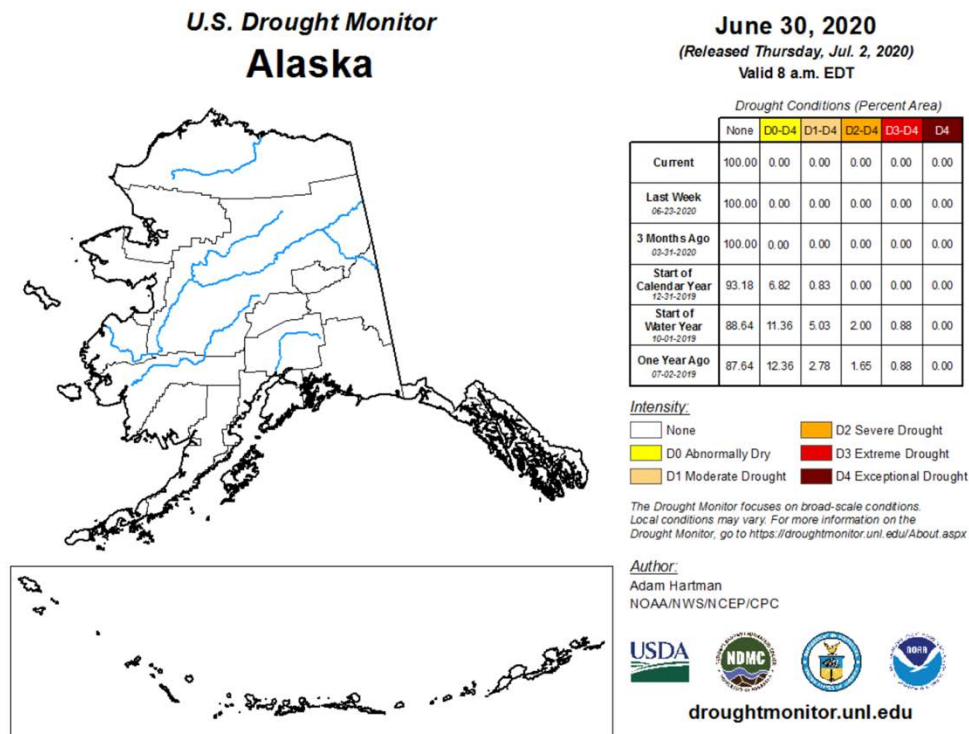


Figure 6: U.S. Drought Monitor map for Alaska, updated on June 30, 2020. The table on the right shows the percent area affected by different categories of drought intensity. Figures and data produced and released by the U.S. Drought Monitor, a partnership between the National Drought Mitigation Center 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

For the month of June 2020, the state of Alaska saw minimal wildfire activity, with the majority of fires being sparked by lightning rather than human activity. Only four new fires were reported (<https://fire.ak.blm.gov/content/aicc/Previous%20Situation%20Reports/2020/06/20-06-30.pdf>). A total of 278 fires and 170,881.7 acres have burned from the start of the year to the end of June 2020. Figure 7 shows that conditions in 2020 have been far wetter than in 2019. Alaska is now past its historical peak of the wildland fires season. Current and forecasted conditions are pointing to a below-normal fire season for the state.

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.

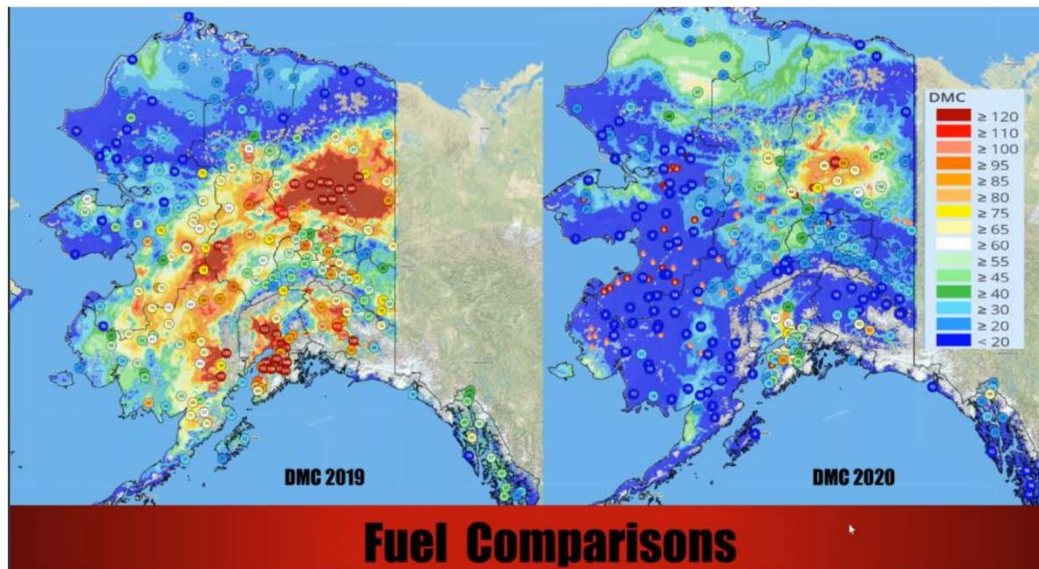


Figure 7: A comparison between duff moisture content (DMC) levels on July 7th in 2019 (left) and 2020 (right). DMC is the moisture content of loosely compacted and decomposing organic matter which is sensitive to temperature, rainfall amount and relative humidity. Blue indicates wetter conditions while red indicates drier conditions. Credit: BLM Alaska Fire Service

Arctic Sea Ice

From May 25 to June 4, 2020 sea ice decreased by **3.00%** from 11.657 million km² to 11.307 million km², remaining about even with the levels in 2018. From June 4 to June 11, 2020 sea ice decreased by **3.70%** from 11.307 million km² to 10.889 million km², still about even with the levels in 2018 but heading down to some all-time lows for this time of year. From June 11 to June 18, 2020 sea ice decreased by **4.17%** from 10.889 million km² to 10.426 million km² showing just about even levels with the all-time record lows for this time of year in 2012, but also heading down to some all-time lows for this time of year. From June 18 to June 25, 2020 sea ice decreased by **5.08%** from 10.426 million km² to 9.906 million km² still showing about even levels with the all-time record lows for this time of year in 2012. Finally, from June 25 to July 1, 2020 sea ice decreased by **6.50%** from 9.906 million km² to 9.262 million km² still showing even levels with all-time record lows for this time of year in 2012. Pictured is the sea ice extent up to this date (Figure 8). We will know if an all-time low will be reached for the year by mid-August – an inflection point for a record season. Figure 9 shows the sea ice concentration through June 2020. Sea ice has been declining about 20% faster this month than the 1981 to 2010 average.

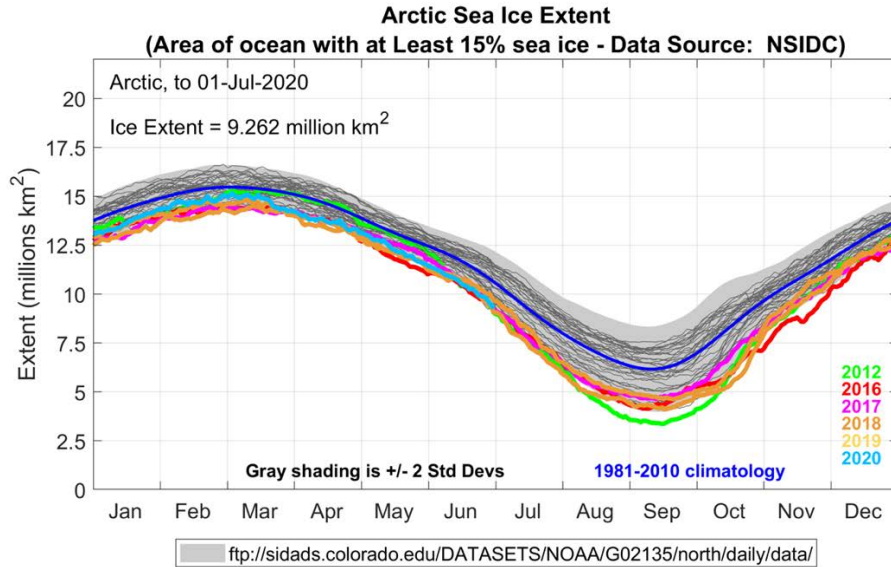


Figure 8: Time series of daily Arctic sea ice extent. This year’s data (light blue) are updated until July 1, 2020. The median sea ice extent for the 1981-2010 reference period is depicted in blue. Specific years are highlighted in colors. Plot Compiled by: Howard J. Diamond, PhD; Climate Science Program Manager at NOAA's Air Resources Laboratory Data Source: National Snow & Ice Data Center (NSIDC; <https://nsidc.org/>).

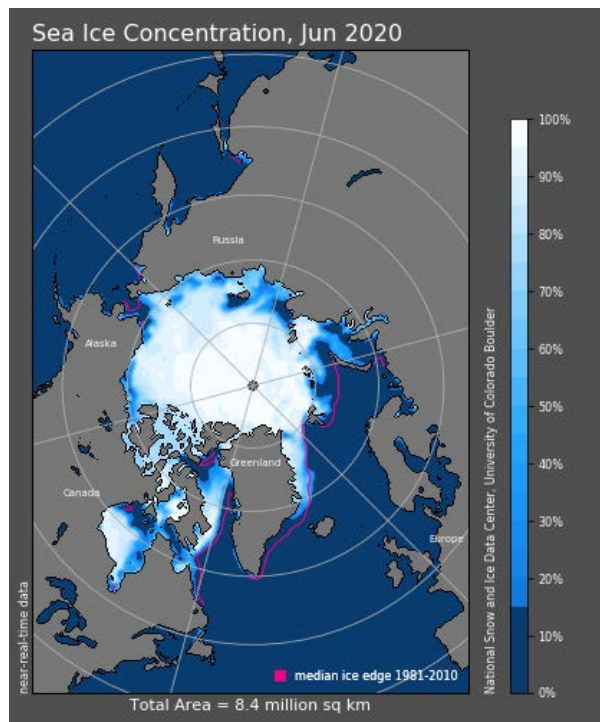


Figure 9: Monthly Arctic Sea Ice concentration for June 2020. Magenta line is outline of the 30-year (1981-2010) median extent for that month. Image: NSIDC (nsidc.org)

Newsworthy Information

June 2020 was the second wettest June ever in Juneau, with 7.3 inches of rain falling (normal = 3.2 inches). The record of 7.48 inches was set in June 2014:

<https://www.ktoo.org/2020/07/01/that-was-the-second-wettest-june-on-record-in-juneau/>

The northernmost town in America (Utqiagvik) recorded 239 consecutive days of a temperature below freezing (32 °F). That streak was finally broken on June 12, 2020, with the temperature reaching 34 °F: <https://weather.com/news/weather/news/2020-06-15-utqiagvik-alaska-america-northernmost-town-239-straight-days-freeze>

Wreckage from a 1952 plane crash on a mountain near Anchorage is melting out of the Colony Glacier. High melt rates and opening crevasses mean the wreckage needs to be recovered sooner than later in order to finally give closure to the families:

<https://weather.com/news/climate/news/2020-06-27-military-plane-crash-alaska-colony-glacier-search-remains>

The year-long MOSAiC science expedition's ice floe broke apart into ice blocks. Scientists were able to sail to the North Pole, highlighting the rapidly changing ice conditions in the Arctic:

<https://www.rcinet.ca/eye-on-the-arctic/2020/08/20/mosaic-international-arctic-science-expedition-expedition-reaches-north-pole/>

A Siberian heat wave has continued into June 2020, also affecting the Laptev sea where sea ice extent dropped to record lows for this time of year:

<http://nsidc.org/arcticseaicenews/2020/07/laptev-sea-lapping-up-the-heat-in-june/>

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 errors to webmaster@akclimate.org.

Appendix

Table A1: June 2020 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. Only highest records were set this month.

Highest Mean Daily Temperature on Record

| Station | Date | New Record (°F) | Year of Old Record | Old Record (°F) |
|-----------------|------------|-----------------|--------------------|-----------------|
| St. Paul Island | 2020-06-03 | 48.5 | 1979 | 48.0 |
| St. Paul Island | 2020-06-08 | 47.5 | 2016 | 46.5 |
| St. Paul Island | 2020-06-18 | 52.0 | 2019 | 51.0 |
| St. Paul Island | 2020-06-19 | 48.5 | 1996 | 47.5 |
| St. Paul Island | 2020-06-20 | 53.0 | 2019 | 49.0 |
| St. Paul Island | 2020-06-21 | 51.5 | 2019 | 49.5 |
| St. Paul Island | 2020-06-23 | 50.0 | 1983 | 49.0 |

Table A2: June 2020 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. One lowest record and multiple highest records were set this month.

Highest Minimum Daily Temperature on Record

| Station | Date | New Record (°F) | Year of Old Record | Old Record (°F) |
|-----------------|------------|-----------------|--------------------|-----------------|
| St. Paul Island | 2020-06-12 | 45.0 | 1979 | 44.0 |
| St. Paul Island | 2020-06-18 | 46.0 | 2005 | 45.0 |
| St. Paul Island | 2020-06-23 | 47.0 | 2019 | 46.0 |

Lowest Minimum Daily Temperature on Record

| Station | Date | New Record (°F) | Year of Old Record | Old Record (°F) |
|----------------|------------|-----------------|--------------------|-----------------|
| Delta Junction | 2020-06-22 | 49.0 | 1919 | 50.0 |

Table A3: June 2020 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. Only highest records were set this month.

Highest Maximum Daily Temperature on Record

| Station | Date | New Record (°F) | Year of Old Record | Old Record (°F) |
|-----------------|-------------|------------------------|---------------------------|------------------------|
| St. Paul Island | 2020-06-02 | 59.0 | 2005 | 57.0 |
| St. Paul Island | 2020-06-03 | 57.0 | 1996 | 54.0 |
| St. Paul Island | 2020-06-08 | 54.0 | 1970 | 52.0 |
| St. Paul Island | 2020-06-19 | 60.0 | 2015 | 56.0 |
| St. Paul Island | 2020-06-20 | 60.0 | 1962 | 57.0 |
| St. Paul Island | 2020-06-21 | 58.0 | 1967 | 57.0 |
| St. Paul Island | 2020-06-22 | 60.0 | 2005 | 58.0 |
| Utqiagvik | 2020-06-27 | 63.0 | 1986 | 62.0 |