Alaska Statewide Climate Summary September 2018

The following report provides an overview of temperature and precipitation for September 2018. The report is based on preliminary data from selected weather stations throughout the state of Alaska. “Departure from normal” refers to the climatological average over the 1981-2010 period.

Temperature

September 2018 was an exceptionally warm and dry month throughout the state. The only station with a slightly below normal monthly mean temperature was Juneau with a deviation of -0.1°F from normal. Kotzebue was the warmest station at 6.8°F above normal, followed by Anchorage (+6.5°F) and Bethel (+5.4°F). King Salmon, Kodiak, McGrath and Nome all recorded monthly mean temperatures over 4°F above normal. Monthly temperature deviations for all stations are listed in Table 1.

Several new monthly temperature records were set: September 2018 was the warmest September on record in Anchorage (measurements started in 1952), Bethel (measurements started in 1923), Kodiak (measurements started in 1931) and Kotzebue (measurements started in 1897). It was the second warmest September on record in Cold Bay, fifth warmest in King Salmon, fourth warmest in McGrath, and third warmest in St. Paul Island and Talkeetna. **New monthly records for average maximum temperature were set in Anchorage, Gulkana, Juneau, King Salmon, and Kodiak**. Kotzebue set a new high record for average minimum temperatures, but overall it seems that high daytime temperatures rather than high nighttime temperatures were driving the high monthly means.

The unusually warm conditions are also reflected in the high number of new daily temperature records listed in Table 2.

Figure 2 shows temperature deviations at all of the selected stations for each day of the month. Anchorage and Kotzebue did not see a single day with below average temperatures in September. Juneau is the only station with a prolonged period of cooler temperatures around the middle of the month. At all other stations, September was characterized by warmer than normal daily temperatures.

Table 1: Mean monthly air temperature, normal (1981-2010) and departure for selected stations throughout the state, September 2018, preliminary values. (*) The station at Delta Junction experienced problems during the first half of the month and is missing data; – values will be updated once data becomes available.

Station	Observed (°F)	Normal (°F)	Departure (°F)
Anchorage	55.0	48.5	6.5
Bethel	51.0	45.6	5.4
Bettles	43.1	40.6	2.5
Cold Bay	51.0	48.1	2.9
Delta Junction*	45.6	43.8	4.3
Fairbanks	48.2	44.8	3.3
Gulkana	46.0	43.3	2.7
Homer	50.3	48.1	2.5
Juneau	49.9	50.0	-0.1
Ketchikan	53.9	52.5	1.4
King Salmon	52.0	47.6	4.4
Kodiak	53.9	49.4	4.5
Kotzebue	49.1	42.3	6.8
McGrath	49.2	44.6	4.6
Nome	47.2	42.8	4.4
St. Paul Island	48.2	45.4	2.9
Talkeetna	50.9	47.5	3.4
Utqiaġvik	35.1	32.1	2.9
Yakutat	50.6	48.4	2.2

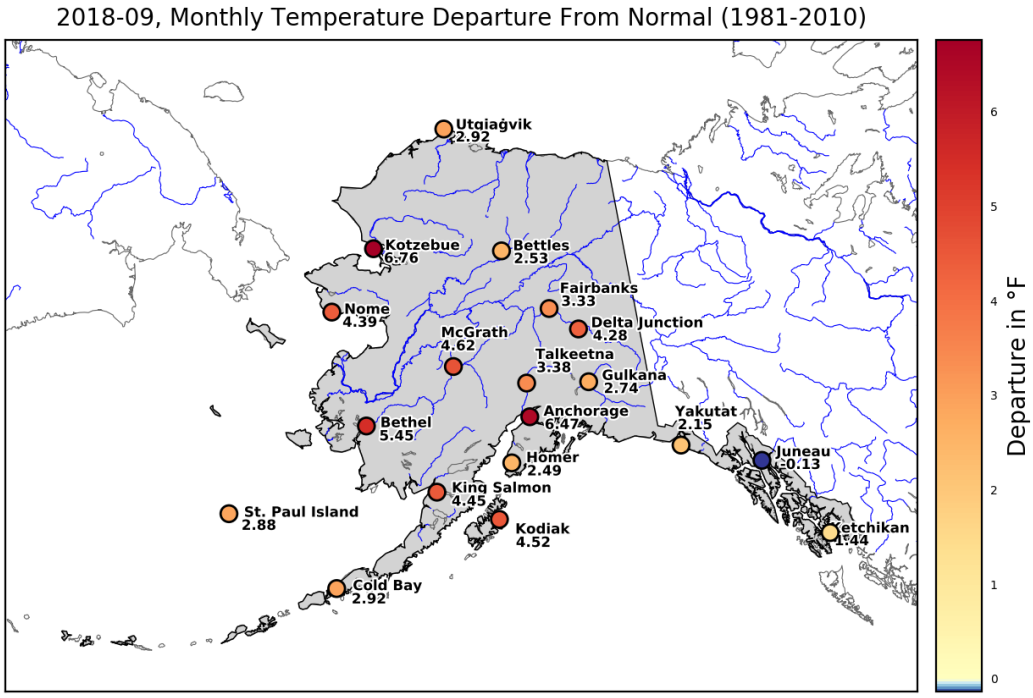

Figure 1: Monthly mean temperature departure from normal, September 2018.

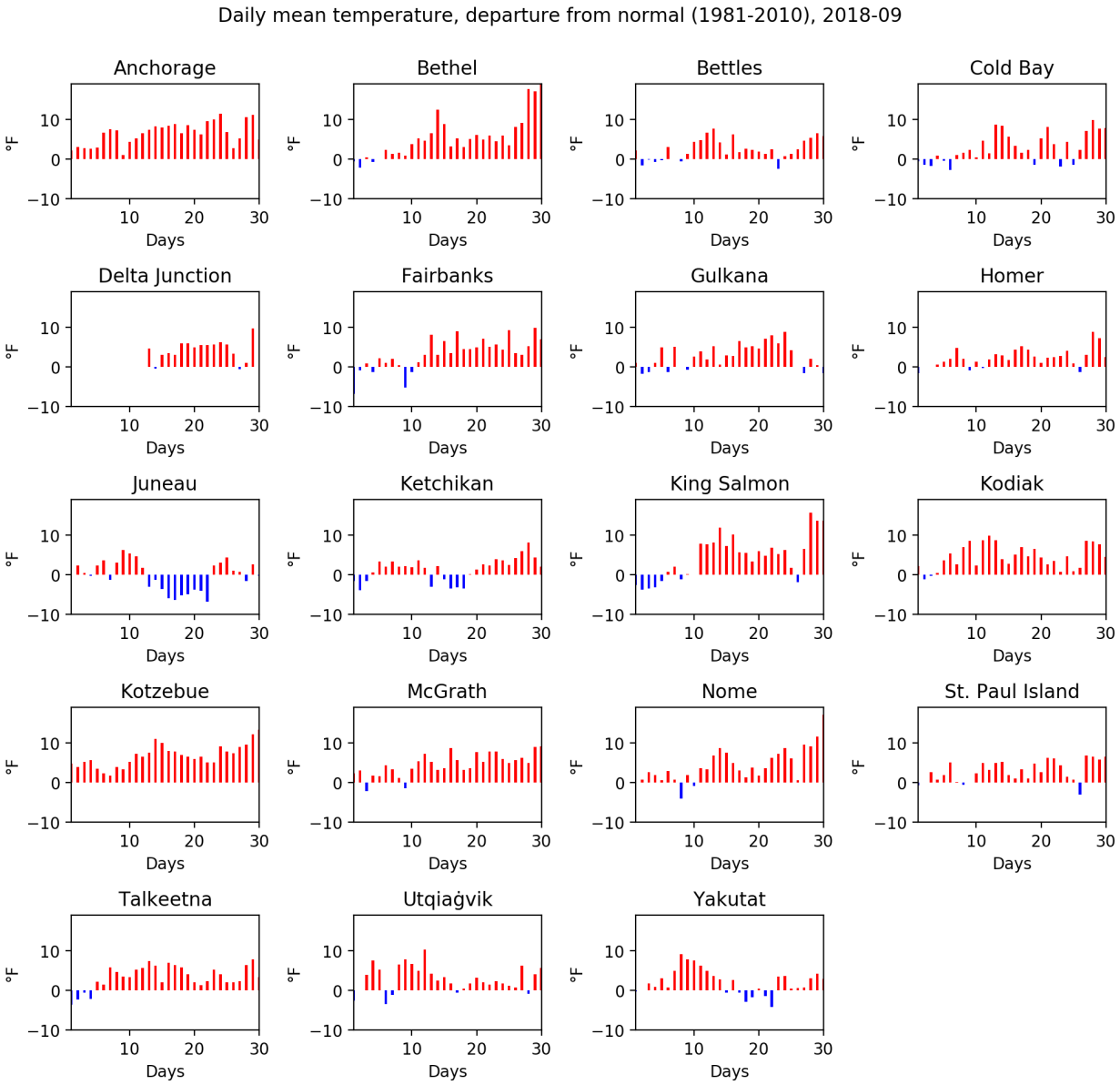

Figure 2: Daily mean temperature departures for each day in September 2018, at the selected stations (unfortunately the weather station in Delta Junction experienced some problems during the first half of the month.)

Table 2: Daily temperature records, September 2018, since the beginning of the respective time series. avgt = daily mean temperature, mint = daily minimum temperature, maxt = daily maximum temperature.

Station	Date	Element	New Record	Year of old record	Old record
High records					
Anchorage	2018/09/07	avgt	59	1993	58.5
Anchorage	2018/09/14	avgt	57.5	1957	56.5
Anchorage	2018/09/15	avgt	57	1965	56
Anchorage	2018/09/17	avgt	57	1995	55
Anchorage	2018/09/24	avgt	57	1965	55
Anchorage	2018/09/28	avgt	54.5	2017	52
Anchorage	2018/09/07	maxt	69	1963	65
Anchorage	2018/09/08	maxt	70	1989	68
Anchorage	2018/09/13	maxt	70	1956	65
Anchorage	2018/09/14	maxt	70	2013	63
Anchorage	2018/09/17	maxt	63	1958	62
Anchorage	2018/09/24	maxt	64	1989	61
Anchorage	2018/09/28	maxt	62	1978	59
Anchorage	2018/09/28	mint	47	1969	46
Bethel	2018/09/14	avgt	59	2006	58
Bethel	2018/09/15	avgt	55	1958	54.5
Bethel	2018/09/28	avgt	57.5	1954	49.5
Bethel	2018/09/29	avgt	56.5	1950	55
Bethel	2018/09/26	maxt	57	1929	56
Bethel	2018/09/28	maxt	68	1936	58
Bethel	2018/09/29	maxt	67	1950	61
Bethel	2018/09/14	mint	54	1965	50
Bethel	2018/09/28	mint	47	1983	44
Bettles	2018/09/29	maxt	56	1966	55
Cold Bay	2018/09/28	avgt	55	1954	53
Cold Bay	2018/09/29	avgt	52.5	1954	52
Cold Bay	2018/09/13	mint	54	1970	51
Cold Bay	2018/09/28	mint	54	1954	50
Juneau	2018/09/11	maxt	72	1941	69
Juneau	2018/09/29	maxt	65	2003	62
King Salmon	2018/09/28	avgt	58	1929	54.5
King Salmon	2018/09/30	avgt	55	2003	54.5
King Salmon	2018/09/13	maxt	73	1979	70

King Salmon	2018/09/14	maxt	76	1939	67
King Salmon	2018/09/28	maxt	70	1929	63
King Salmon	2018/09/30	maxt	71	1954	70
Kodiak	2018/09/09	avgt	60	1990	58
Kodiak	2018/09/06	maxt	69	1985	68
Kodiak	2018/09/09	maxt	71	1990	70
Kodiak	2018/09/11	maxt	74	2003	66
Kodiak	2018/09/12	maxt	76	1941	69
Kodiak	2018/09/13	maxt	73	1980	71
Kodiak	2018/09/16	mint	53	1970	52
Kodiak	2018/09/27	mint	51	1947	50
Kodiak	2018/09/28	mint	52	1942	50
Kodiak	2018/09/29	mint	52	1942	51
Kotzebue	2018/09/29	avgt	47.5	1966	46.5
Kotzebue	2018/09/30	avgt	48	1966	45.5
Kotzebue	2018/09/29	maxt	53	1984	52
Kotzebue	2018/09/30	avgt	47.5	1966	46.5
McGrath	2018/09/30	maxt	62	1950	58
Nome	2018/09/29	avgt	48.5	1929	48
Nome	2018/09/30	avgt	53.5	1942	48
Nome	2018/09/30	maxt	57	1969	52
Nome	2018/09/30	mint	50	1929	45
St. Paul Island	2018/09/21	avgt	50.5	2004	49.5
St. Paul Island	2018/09/22	avgt	50	2005	49.5
St. Paul Island	2018/09/25	maxt	54	1979	52
Talkeetna	2018/09/13	maxt	73	1997	70
Talkeetna	2018/09/13	maxt	66	1942	65
Yakutat	2018/09/08	avgt	59	1930	57.5
Yakutat	2018/09/09	avgt	57.5	2007	56.5
Yakutat	2018/09/07	maxt	72	1974	68
Yakutat	2018/09/08	maxt	73	1979	71
Yakutat	2018/09/09	maxt	73	1989	71
Yakutat	2018/09/10	maxt	75	1930	69
Yakutat	2018/09/11	maxt	74	1986	68
Yakutat	2018/09/30	maxt	66	1967	62
Low records					
Juneau	2018/09/17	mint	29	1941	30

Precipitation

Fairbanks was the only station that recorded unusually wet conditions in September with 169% of normal. St. Paul Island, King Salmon, and Homer experienced average conditions at 100%, 99%, and 97% of normal, respectively. All other stations recorded significantly less than normal precipitation. Seven stations saw less than 40% of normal precipitation. Gulkana recorded only 6% of normal, making it the driest station this month followed by Yakutat (15%) and Kotzebue (24%). See Table 3, Figure 3.

Table 3: Monthly precipitation sum, normal (1981-2010) and departure expressed as a percentage of the normal (1981-2010) for selected stations throughout the state, September 2018, preliminary values. (*) The station at Delta Junction experienced problems during the first half of the month and is missing data – values will be updated if data becomes available.

Station	Precipitation (in)	Normal (in)	% of normal
Anchorage	0.9	3.0	29.1
Bethel	1.8	2.8	67.3
Bettles	1.2	1.9	62.8
Cold Bay	3.5	4.7	73.8
Delta Junction *	0.3	1.0	27.2
Fairbanks	1.9	1.1	169.1
Gulkana	0.1	1.6	6.3
Homer	3.2	3.3	97.3
Juneau	2.3	8.6	26.4
Ketchikan	4.9	13.8	35.7
King Salmon	3.1	3.2	98.7
Kodiak	3.2	7.4	43.5
Kotzebue	0.4	1.6	24.1
McGrath	1.9	2.5	77.1
Nome	1.3	2.4	53.5
St. Paul Island	3.0	3.0	100.0
Talkeetna	2.4	4.3	55.6
Utqiaġvik	0.5	0.7	65.3
Yakutat	3.2	21.1	15.0

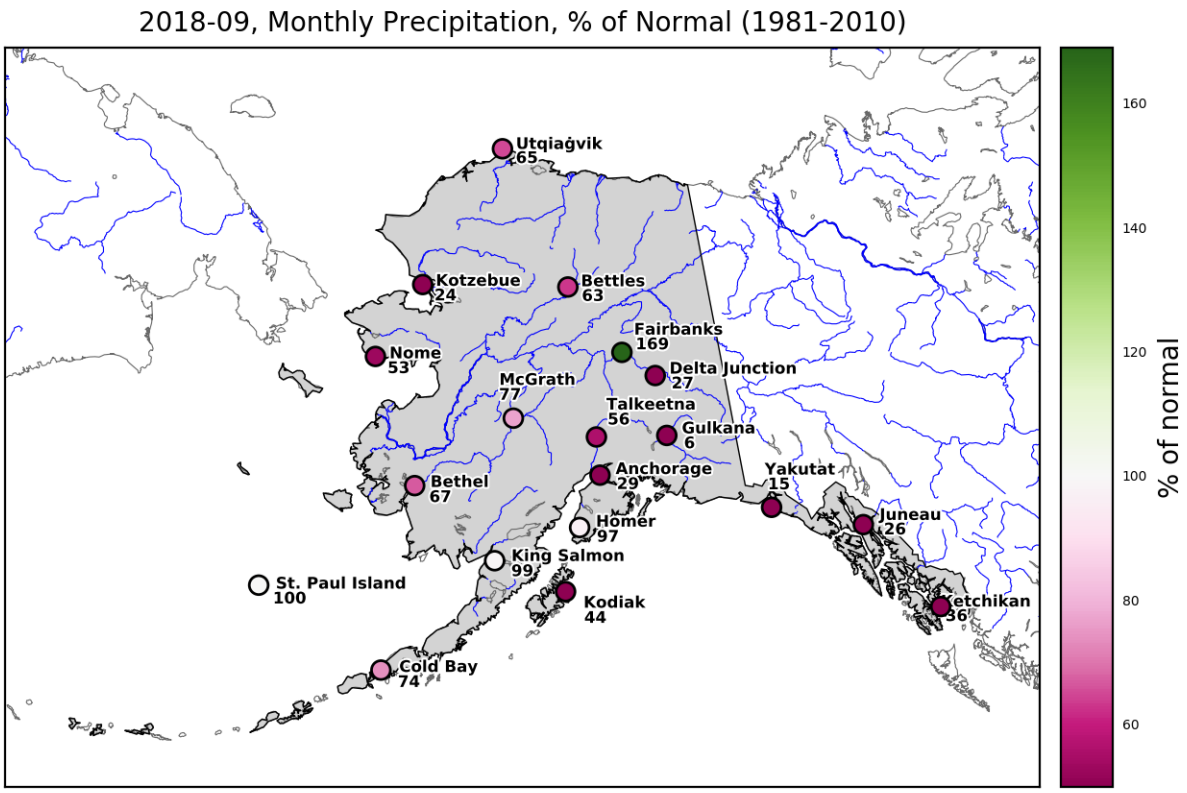

Figure 3: Monthly precipitation sums expressed as percent of normal (1981-2010), September 2018.

In the interior and western regions of the state the dry conditions of September follow an unusually wet August. However, in the southeast - and particularly in the southernmost regions of the panhandle – it has been drier than normal for months. The northern half of the panhandle remains in “abnormally dry conditions” as defined by the US Drought Monitor (https://www.drought.gov/drought/). The southern half has reached “severe drought” conditions (Figure 4).

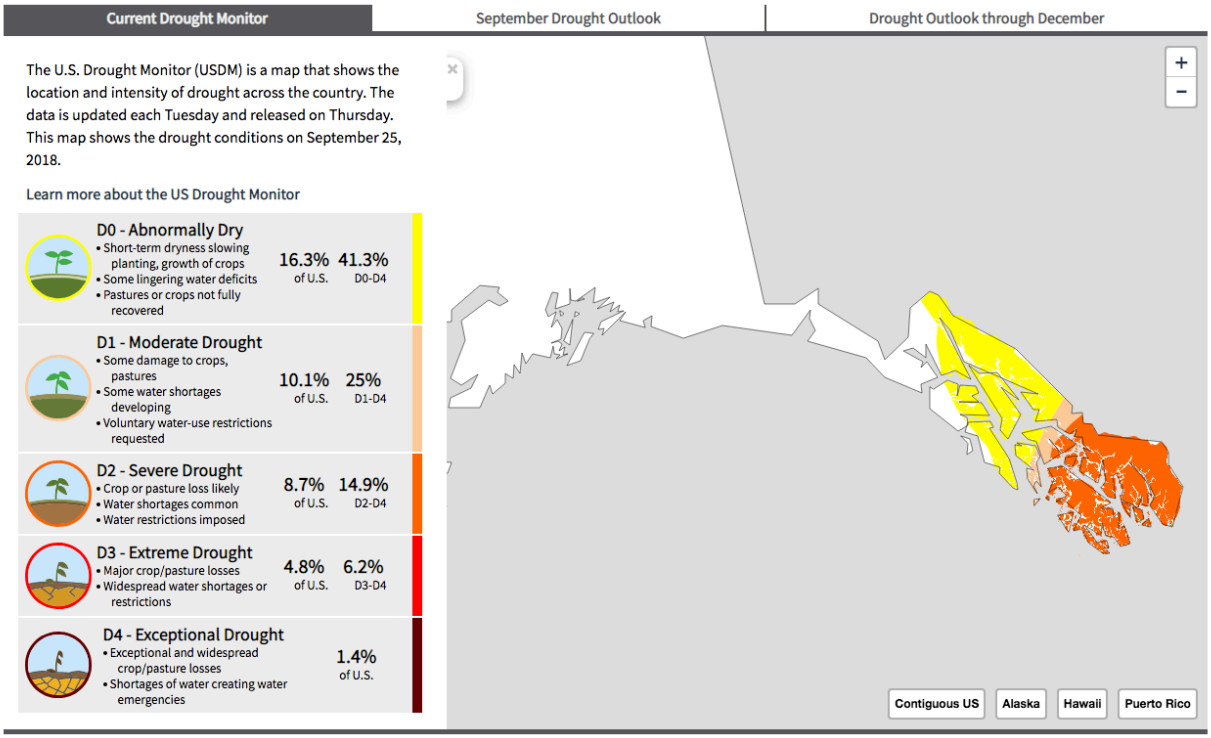

Figure 4: D0 to D2 drought conditions in Alaska's southeast (https://www.drought.gov/drought/)

Figure 5 shows the monthly precipitation sums at each station in inches. It can be seen how strongly precipitation varies between stations not only during the past month but also in the climatological mean, due to the diverse climatological conditions that can be found in Alaska.

Stations in the interior such as Fairbanks and Bettles often receive at least traces of snow in September. This year, none of the selected stations recorded any snowfall in September, in keeping with the overall warm and dry conditions. Snow did fall at higher elevations in the state's mountain ranges as well as in parts of the North Slope.

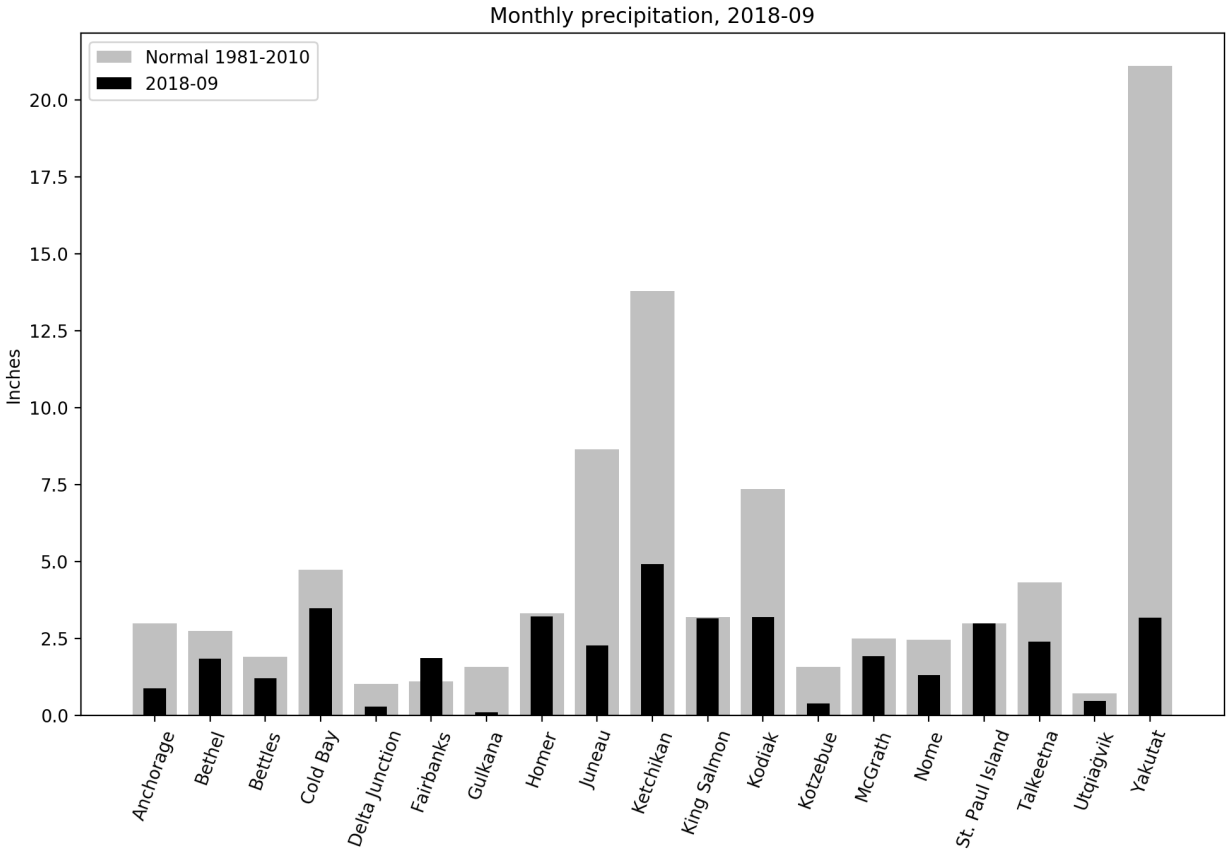

Figure 5: Monthly precipitation sums for September 2018 at the selected stations compared to the normal (1981-2010), in inches.

Newsworthy Events

The NSIDC derived data indicate that Arctic sea ice appears to have reached its seasonal minimum extent on September 23rd at 4.58 million square kilometers (Figure 6, http://akclimate.org/node/1379). Unless late season melt or changing winds cause further shrinkage, September 23rd marks the end of the Arctic sea ice melt season for 2018. This ties 2018 for the sixth lowest minimum extent in the satellite record along with 2008 and 2010. The twelve lowest Arctic sea ice extents in the satellite era have all occurred in the last twelve years.

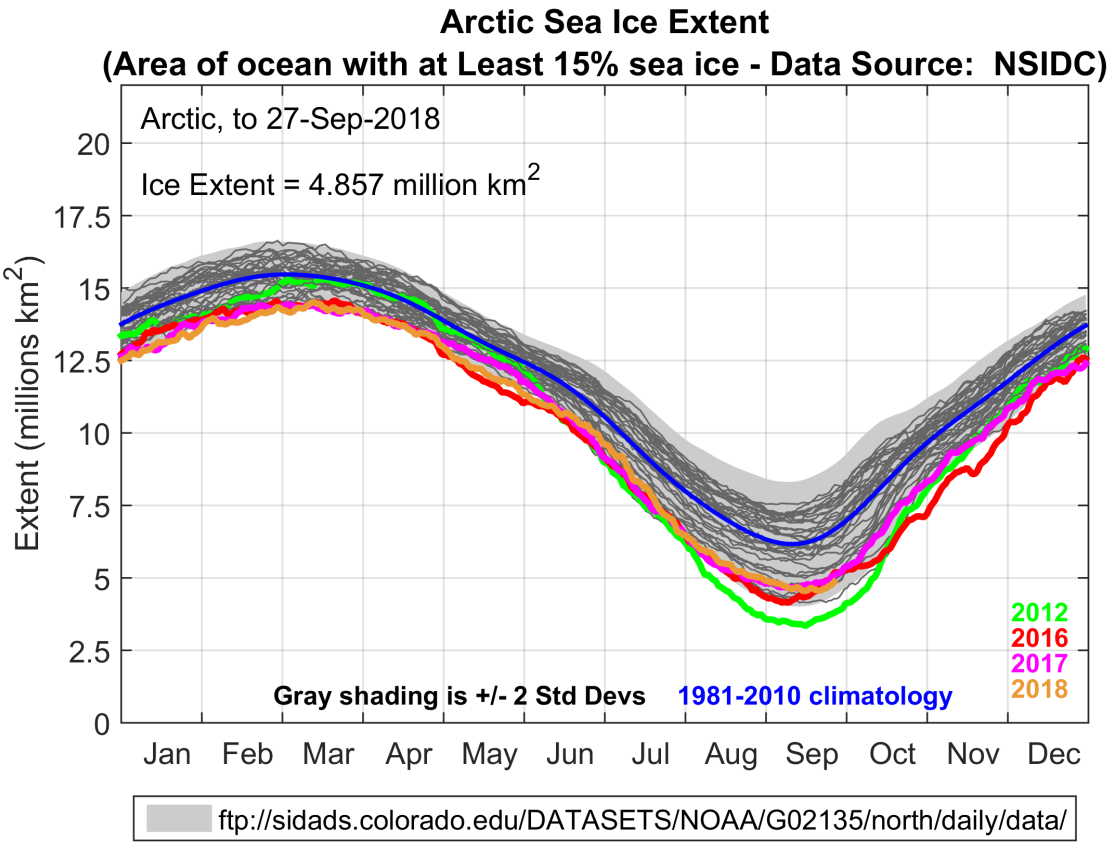

Figure 6: Daily Arctic sea ice extent for 2018 in comparison to previous years. The plot was compiled by Howard J. Diamond (NOAA) for the Alaska Climate Research Center with NSIDC data as source.

Arriving in St. Petersburg on September 28, the Danish cargo ship Venta Maersk successfully completed a historic trial passage of the Northern Sea Route. The Venta Maersk is an ice-class vessel and as such is specifically designed to operate in cold waters. While the trial was successful, the Maersk shipping company currently does not see the Northern Sea Route "as a viable commercial alternative to existing east-west routes." Nonetheless, the Venta Maersk's

successful voyage marks another milestone for commercial shipping in the Arctic. As sea ice conditions change and ice extent diminishes, international political and economic interests remain keenly focused on potentially profitable new routes becoming accessible to commercial shipping traffic.

Following damaging storms in August, the North Slope Borough filed a disaster emergency declaration in early September. This gave the Borough access to 22,000 sandbags from the US Army Corps of Engineers to temporarily protect the area behind a damaged seawall. Declining sea ice has exacerbated storm damage in the fall season along the Utqiaġvik coastline.

This information consists of preliminary 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 web site at http://akclimate.org. Please report any errors to webmaster@akclimate.org.