



Quarterly Weather & Climate Summary Gates of the Arctic National Park & Preserve Summer 2015

Bettles Summer Weather

With an average summer temperature of 56.5°F, summer 2015 was just below the 1981-2010 normal of 56.9°F. 6.84 inches of precipitation was recorded for the summer season. Normal is 6.40 inches. (Figures 1 and 2; Tables 1 and 2).

June was colder and drier than normal. The average temperature for the month was 57.5°F, compared to a normal of 58.5°F. Low temperatures of 34°F and 32°F on June 11-12 set new record daily minimum temperatures. 0.64 inches of precipitation was recorded in June, almost all of which fell from June 5-10 (0.59 inches total). The expected rainfall total for the month of June is 1.40 inches – June 2015 was less than 50% of normal. Hot, dry conditions in the last few weeks of June led to smoky conditions in Bettles and the central Brooks Range.

July was a little warmer and drier than normal. The average monthly temperature was 60.8°F, 1.1°F warmer than the 1981-2010 normal. 1.96 inches of precipitation fell in July, 75% of normal. One inch fell July 7-8 and another 0.75 inches of precip was measured between July 15-21.

Overall, August was cool and wet. The mean monthly temperature was 51.1°F, 1.4°F cooler than normal. The monthly low temperature was 22°F recorded on August 31. Precipitation was 160% of normal for the month with 4.24 inches. No snow was recorded in Bettles in August.

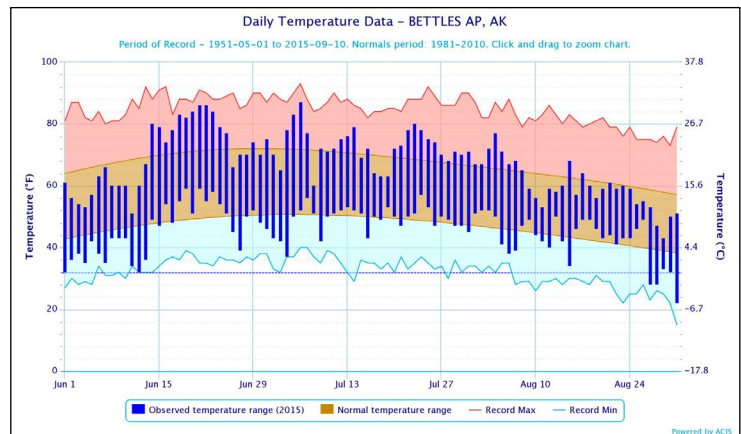


Figure 1. Summer 2015 daily temperatures at Bettles showing **record maximum** (red), **record minimum** (blue), **normal** (brown) and **2015 observed** range (blue bars).

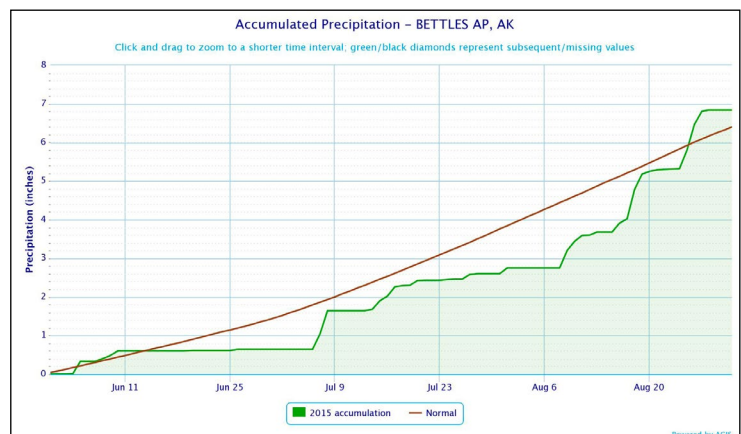


Figure 2. Summer **2015** accumulated precipitation at Bettles (green) compared to **normal** (brown line).

Table 1. Temperature: Summer 2015 average monthly temperatures compared to the 1981-2010 normal.

Summer 2015	Average Monthly Temp °F	1981-2010 Normal °F	Departure from Normal °F	Monthly High °F / Date	Monthly Low °F / Date
June	57.5	58.5	-1.0	86 / June 21, 22	32 / June 1, 12
July	60.8	59.7	+1.1	87 / July 6	37 / July 4
August	51.1	52.5	-1.4	77 / Aug. 4	25 / Aug. 31

Summer Season Temperature Departure from Normal: -0.4°F

Table 2. Precipitation: Summer 2015 monthly precipitation totals compared to normal.

Summer 2015	Total Monthly Precip. in.	1981-2010 Normal in.	Departure from Normal in.	Greatest 24 -hr. total in. / Date	# Days with ≥ 0.01 in. water
June	0.64	1.40	-0.76	0.32 / June 5	7
July	1.96	2.36	-0.40	0.60 / July 8	14
August	4.24	2.64	+1.60	0.76 / Aug. 18	19

Summer Season Precipitation Departure from Normal: +0.44 inches (107% of normal)

NPS Climate Monitoring Stations

We now have additional NPS climate stations in Gates of the Arctic that complement existing National Weather Service stations at Bettles (Figure 3). These new NPS stations will provide critical data on high elevation sites in

the Arctic and will help characterize the climate gradients and patterns affecting resources in the Gates of the Arctic parklands.

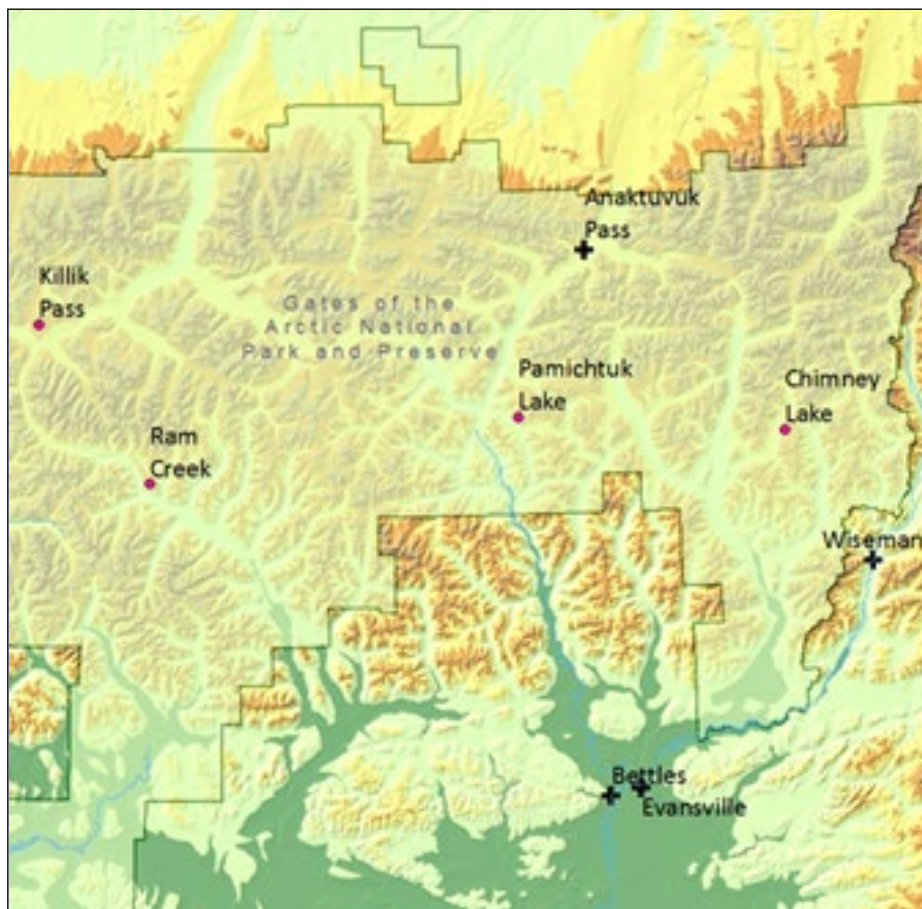


Figure 3. NPS Climate stations in Gates of the Arctic National Park and Preserve.

Table 3. Summary of weather statistics from climate stations in and near Gates of the Arctic. All data are preliminary and subject to review. Sites in **bold font** are NPS stations installed in 2012.

Park	Site	Elev. (ft)	Average Temp °F			Extreme High (°F)	Extreme Low (°F)	Average Temp. Summer Season (°F)	Peak Wind (mph)	Rainfall (inches)		
			June	July	Aug.					June	July	Aug.
GAAR	Killik Pass	4355	--	47.1	36.7	62	--	--	32	--	2.95	2.85
	Ram Creek	4100	46.3	50.8	40.7	71	22	45.9	44	1.37	2.25	1.88
	Pamichtuk	3135	49.6	53.8	44.0	76	24	49.1	45	0.68	2.07	3.16
	Chimney Lake	3700	46.7	50.5	40.7	71	22	46.0	43	--	2.24	3.78
Other	Ivotuk CRN	1909	48.6	49.9	41.8	79	22	46.8	31	0.41	2.68	3.60
	Atigun Pass	4800	41.6	46.0	36.4	67	17	41.3	--	1.9	1.7	5.8
	Norutak Lake RAWS	800	58.0	60.3	50.0	87	20	56.1	33	1.09	1.99	3.38

Interesting Notes from the ARCN Climate Stations

- On average, the higher elevation NPS RAWS sites were 5-10°F colder compared to Bettles. Peak wind speeds from 32-45 mph were recorded this summer.
- Chimney Lake recorded the most rainfall of the 4 NPS sites in August. More than three inches were recorded from August 16-27. Solid precipitation (snow) is not measured at NPS stations. Atigun Pass snotel (35 miles to the NE and 1000 feet higher) measured over 1 inch of water equivalent (in 6 inches of snow) the last five days of August. Precipitation at Atigun Pass totaled 5.8 inches for the month.
- NPS climate staff visited RAWS stations in late June/early July 2015. Stations were accessed by float plane and hiking from nearby (2-5 miles) lakes at Killik, Pamichtuk, and Chimney. Ram Creek was accessed by packrafting the Alatna River from Gaedeke Lake to Circle Lake and hiking to the station along the way.

Bettles Summer Temperature Trend

The average summer temperature in Bettles for 2015 was -56.5°F, 0.4°F colder than the 1981-2010 normal period. Summer 2015 was 1.8°F warmer than 2014.

We calculate the average summer temperature by simply taking the average of June, July, and August monthly temperatures. Average summer temperatures are variable with a range between 53.4°F in 1963 and 61.2°F in 2004.

The overall trend in summer temperatures is positive, with a significant increase of 0.26°F per decade based on a simple linear regression ($p < 0.05$). The 10-year moving average shows that the warmest period occurred in the 1990s (Figure 4).

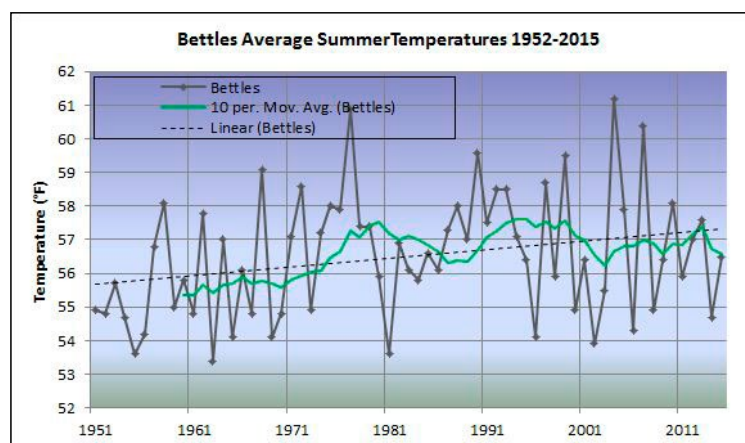


Figure 4. Average summer temperatures (June, July, August) at Bettles since 1952. The green line is a 10-year moving average. The dashed line is a simple linear regression.

Bettles Summer Precipitation Trend

The summer season 2015 precipitation total was 6.84 inches, 113% of the long-term average (1952-2015) and 107% of normal based on the latest climate normal period (1981-2010). The average precipitation for the summer season in Bettles is 6.4 inches.

Summer is the wettest season in Bettles with precipitation amounts ranging from less than 2 inches to almost 13 inches. The summer of 1963 was the wettest on record with 12.96 inches of precipitation over the three month season. There is no significant trend in summer precipitation in Bettles since 1951.

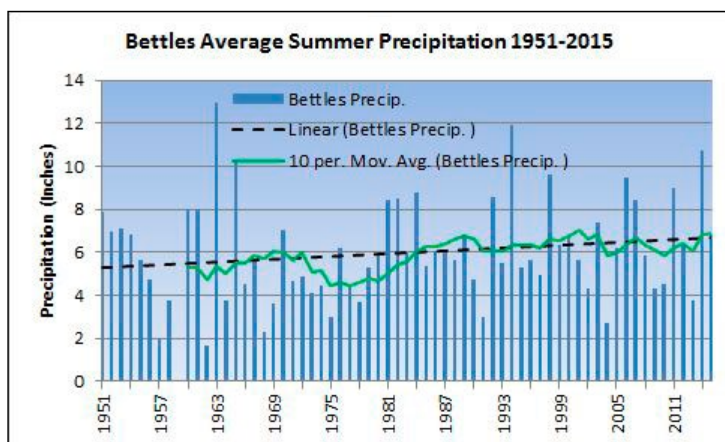
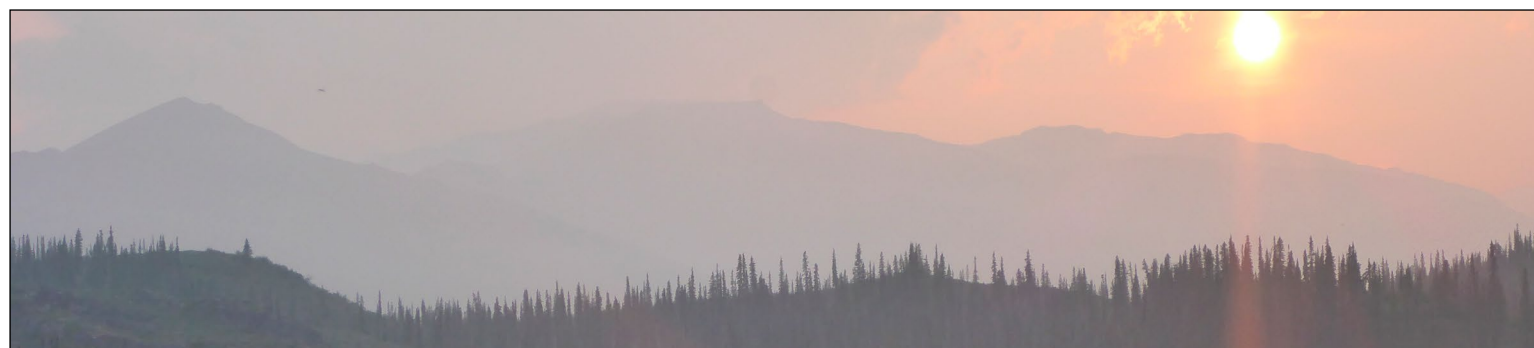


Figure 5. The bars show the summer precipitation totals in Bettles between 1952 and 2015. The green line represents a 10-year moving average and the dashed line is a simple linear regression.



Connecting Further

- Previous weather summaries and other climate monitoring documents on the [Arctic Network web portal](#)
- Access near real-time data from [Western Regional Climate Center](#) and [MesoWest](#)
- Statewide summary of weather highlights in the latest [Alaska Climate Dispatch](#) from the Alaska Center for Climate Assessment and Policy

- [Maps](#) of projected temperature and precipitation changes for Gates of the Arctic National Park and Preserve

More Information

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