



Quarterly Weather & Climate Summary Western Arctic Parklands Summer 2015



Kotzebue Summer Weather

It was a warm summer with near-normal precipitation totals in Kotzebue. The average summer temperature for the season was 53.7°F, which is 3.0°F warmer than normal and 3.6°F warmer than the long-term average. Warm June and July temperatures brought the seasonal average above normal; August was the one month that was cooler than normal. Summer precipitation totaled 4.55 inches and was ~108% of normal. Most of the summer rain fell in August, with the major storm of the summer dropping 2.22 inches August 24-26.

June was warm and dry. The average temperature was 51.3°F, compared to a normal of 45.7°F. Temperatures were warmest June 18-23 with temperatures as high as 79°F on June 18. The high of 70°F on June 23 was a record for the date. Only six days in June had measurable precipitation, totaling 0.21 inches. Precipitation was 36% of normal for the month.

The average temperature for July was 4.1°F above normal at 58.7°F. Temperatures were above normal most of the month, with a daily record of 79°F on July 6. It was the 7th warmest July on record. Precipitation for the month was only 0.35 inches; normal is 1.45 inches. It was the driest July since 1985.

August 2015 was cool with a monthly average of 51.1°F, 0.6°F cooler than normal. Rain was measured on sixteen days in August, totaling 3.99 inches, almost 90% of the summer total. 2.22 inches of rain fell August 24-26 in Kotzebue. The same system brought flooding in Barrow and 2.6 inches of rain in Nome (Figures 1 and 2; Tables 1 and 2).

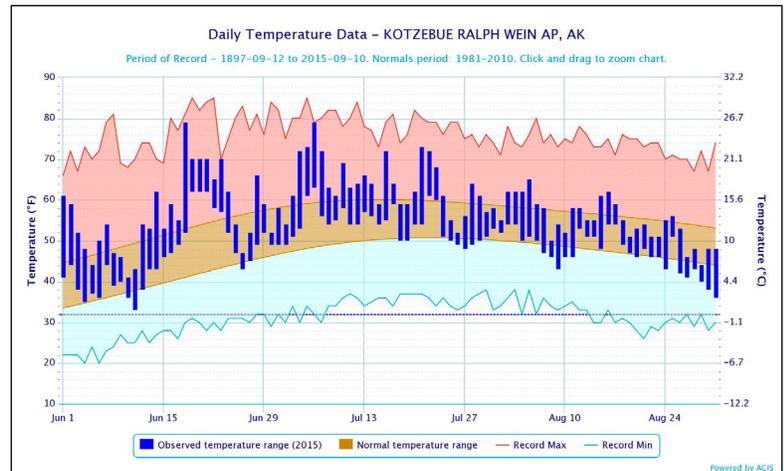


Figure 1. Summer 2015 daily temperatures at Kotzebue showing record maximum (red), record minimum (blue), normal (brown) and 2015 observed range (blue bars).

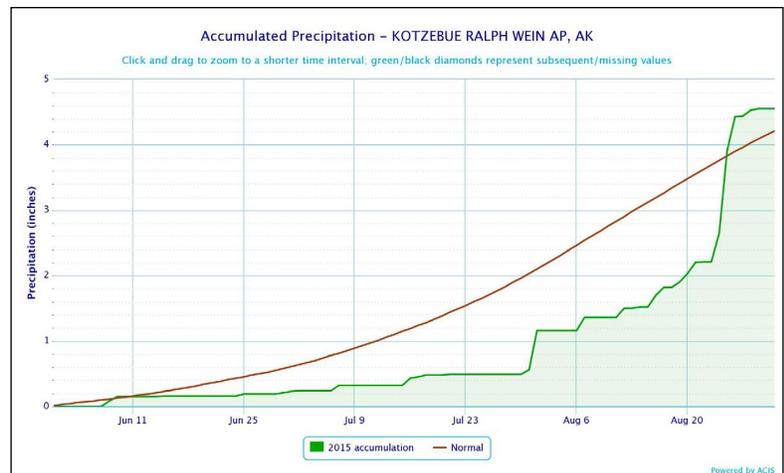


Figure 2. Summer 2015 (green) precipitation at Kotzebue for June through August compared to normal (brown line).

Table 1. Kotzebue 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	51.3	45.7	+5.6	79 / June 18	33 / June 11
July	58.7	54.6	+4.1	79 / July 6	48 / July 27
August	51.1	51.7	-0.6	65 / Aug. 5	36 / Aug. 31

Summer Season Temperature Departure from Normal: +3.0°F

Table 2. Kotzebue 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	0.21	0.58	-0.37	0.08 / June 8	6
July	0.35	1.45	-1.10	0.11 / July 16	8
August	3.99	2.18	+1.81	1.26 / Aug 25	16

Summer Season Precipitation Departure from Normal: +0.34 inches (108% of normal)

NPS Climate Monitoring Stations

We now have additional NPS climate stations in Cape Krusenstern, Noatak, and Kobuk Valley that complement existing National Weather Service stations at Kotzebue and along the Kobuk River to the south (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 Western Arctic parklands.



Figure 3. NPS Climate stations in Western Arctic Parklands.

Table 3. Summary of weather statistics from climate stations in and near Western Arctic Parklands. 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.
CAKR	Tahinichok	966	45.1	54.3	44.1	74	27	47.8	35	0.56	1.15	5.12
	Mt. Noak	809	48.0	55.2	45.4	76	28	49.5	30	0.44	1.27	6.79
NOAT	Asik	1329	47.0	54.4	43.6	73	28	48.3	45	0.86	1.90	6.32
	Kelly RAWS	412	51.9	59.1	47.9	81	28	53.0	32	1.45	1.54	4.76
	Kugururok	1020	48.7	55.6	44.9	78	27	49.7	25	0.86	2.04	2.71
	Sisiak	1823	46.6	53.1	42.9	75	24	47.5	42	1.31	--	--
	Noatak RAWS	321	51.8	56.4	46.0	82	25	51.4	55	1.02	2.52	2.71
	Howard Pass	2062	47.2	50.5	41.3	76	23	46.3	--	0.54	3.08	2.63
	Kaluich	2411	45.8	50.9	41.1	72	23	45.9	--	--	--	4.46
	Imelyak	3569	44.1	49.0	39.0	67	23	44.0	44	0.60	4.09	4.95
KOVA	Kavet Creek RAWS	235	56.6	61.4	50.4	87	30	56.1	36	0.88	2.23	4.54
	Salmon River	1262	--	56.0	45.8	78	--	--	31	1.76	2.47	3.99

Interesting Notes from the ARCN Climate Stations

- Snow drifts near Salmon River persisted through June 20. See photos below.
- On July 6, temperatures exceeded 80°F at the low elevation fire RAWS sites in the Noatak Valley (Kelly Ranger Station and the Noatak RAWS near Makpik Creek). The nearest high-elevation sites (Sisiak and Kaluich) were 10 to 15 degrees cooler on the same day.
- The major storm event of the summer season favored CAKR and western NOAT. The tipping bucket at Mt. Noak measured 4.09 inches of rain August 24-26. Tahinichok and Asik each recorded about 2.8 inches. Winds as high as 35 mph were recorded at Tahinichok.

Kotzebue Summer Temperature Trend

The average summer temperature in Kotzebue for 2015 was 53.7°F, the 6th warmest summer on record and 3.0°F warmer than the 1981-2010 normal period.

We calculate the average summer temperature by simply taking the average of June, July, and August monthly temperatures. Average summer temperatures show great variability with a range between 44.5°F in 1931 and 57.3°F in 2004.

The overall trend is positive, with a significant increase of 0.4° F per decade based on a simple linear regression (Figure 4).

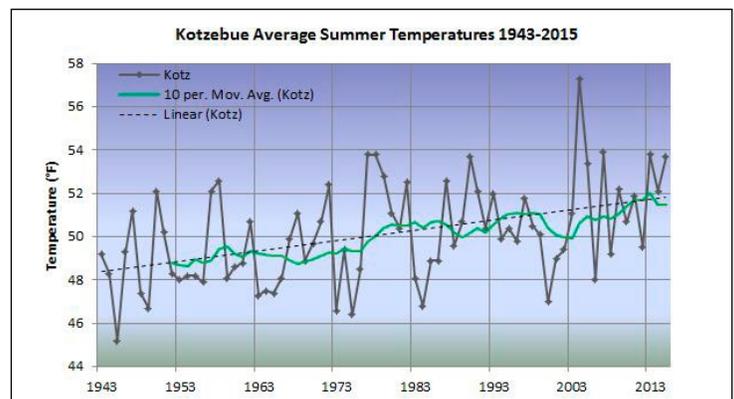


Figure 4. Average summer temperatures (June, July, August) at Kotzebue since 1943. The green line is a 10-year moving average. The dashed line is a simple linear regression.

Kotzebue Summer Precipitation Trend

The total summer precipitation in Kotzebue in 2015 was 4.55 inches. Normal summer precipitation totals average 4.21 inches. Summer is the wettest season in Kotzebue and annual totals are variable. 1963 is on record as the wettest with 8.31 inches and 1977 is the driest with 0.74 inches. There is not a significant trend in summer precipitation since 1943 (Figure 5).

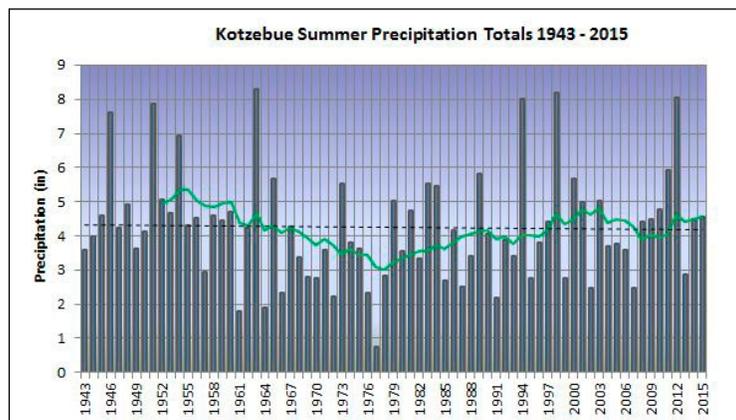


Figure 5. Summer precipitation totals (June, July, August) at Kotzebue since 1943. The green line represents a 10-year moving average and the dashed line is a simple linear regression.



Glimpses of the summer season in Kobuk Valley

The phenology camera on the Salmon River station in Kobuk Valley National Park and Preserve site captured images through the early summer season and were downloaded on July 20. The photos (below) captured the melt-out of nearby snow drifts through June with scenes from June 1, 10, and 20 (Figure 6). Green-up is also evident

and will be quantified as part of the Terrestrial Landscape Patterns and Dynamics vital sign. The camera captures images five times per day; the images are downloaded once a year. The photos are used to help quantify the snow season, green-up period, and other basic phenologic information.



Figure 6. Photos from Salmon River climate station: June 1 (left), June 10 (middle), and June 20, 2015 (right).

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

- New paper published – [Strong Temperature Increase and Shrinking Sea Ice in Arctic Alaska](#)

More Information

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