



## Quarterly Weather & Climate Summary Denali National Park & Preserve Summer 2015

### Denali Summer Weather

In Denali, June temperatures started out on the cool side and climbed through mid-month. The average monthly temperature of 54.0°F was 1.2°F warmer than normal. The high temperature for the month was 80°F, which occurred on the 16th, 20th, and the 21st. The low temperature on June 2nd of 27°F was just a few degrees away from the record minimum for that day. The total rainfall for June was 2.46 inches, which is 0.31 inches more than normal.

July was cool and wet. The average air temperature was 1.2° cooler than normal at 54.4°F. There was measurable precipitation on 25 out of 31 days of the month. Total rainfall for the month was 6.18 inches, 192% of normal for July. There were five days of the month with >0.5 inches of rain recorded over a 24-hr period, and both July 19th and 20th had rainfall totals > 1.0 inch. It was the 4th wettest July on record.

The cool, wet conditions continued into August. The average temperature for the month was 1.4°F cooler than normal at 49.2°F and precipitation totals were again well above normal. 5.16 inches of rain fell during the month, which is 2.45 inches more than normal. 23 of the 31 days of the month had measurable rainfall. The last week of August was particularly wet. It rained every day between August 22 and 31 with a total accumulation of 3.29 inches. It was the 7th wettest August on record.

Overall, summer of 2015 was the third wettest summer on record. A total of 13.80 inches fell over the three month period; 1967 was the wettest summer with a total of 14.90 inches. The seasonal temperature was near normal at 52.5°F, just a half degree cooler than normal (Figures 1 and 2; Tables 1 and 2).

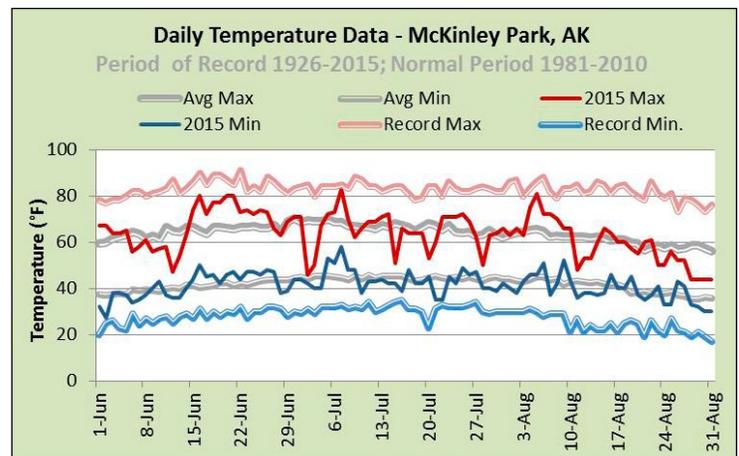


Figure 1. Summer 2015 daily temperatures at Denali showing **record maximum** (red), **record minimum** (blue), **normal** (grey) and 2015 observed **maximum** and **minimum**.

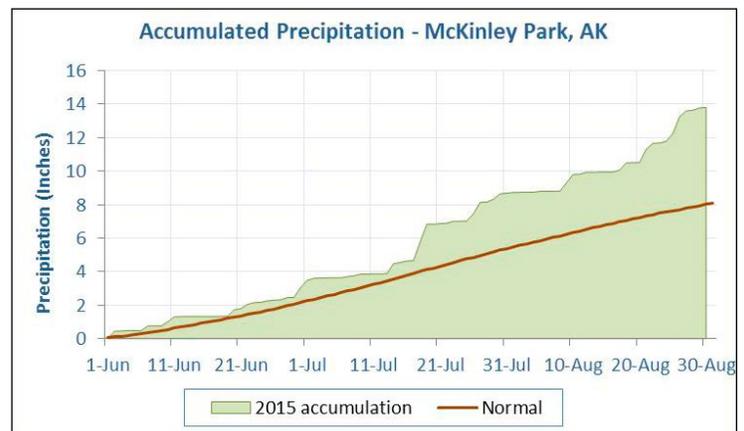


Figure 2. Summer **2015 accumulated precipitation** at Denali (green) compared to **normal** (brown).

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	54.0	52.8	+1.2	80 / Jun 16, 20, 21	27 / Jun 2
July	54.4	55.6	-1.2	83 / Jul 7	35 / Jul 21, 22
August	49.2	50.6	-1.4	81 / Aug 5	30 / Aug 30, 31

Summer Season Temperature Departure from Normal: -0.5°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	2.46	2.15	+0.31	0.44 / Jun 3	17
July	6.18	3.22	+2.96	1.12 / Jul 19	25
August	5.16	2.71	+2.45	1.00 / Aug 27	23

Summer Season Departure from Normal: +5.72 inches; (171% of normal)

### Climate Monitoring in Denali

There are additional NPS climate stations in Denali that complement the long-term record available from the National Weather Service station at Park headquarters (Figure 3). These additional sites provide critical data on a park-wide scale that help characterize the climate gradients and patterns affecting resources in Denali National Park and Preserve. In 2013, University of Alaska researchers installed a weather station near 14,000' on Denali. Summer statistics from these sites are summarized in Table 3. This summer a new U.S. Climate Reference Network (USCRN) station was installed in Denali near Wonder Lake in cooperation with the National Oceanic and Atmospheric Administration (NOAA). The vision of the program is to provide a continuous series of climate observations for monitoring trends in the nation's climate and supporting climate-impact research.

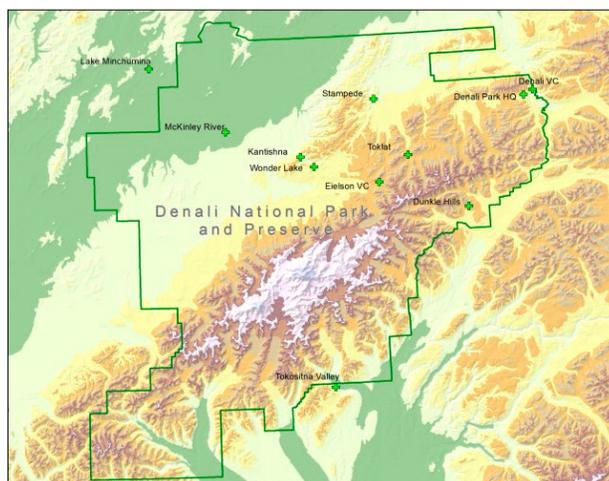


Figure 3. Locations of climate stations in Denali.

Table 3. Summary of weather statistics from the Denali climate stations. All data are preliminary and subject to review.

Site	Elev. (ft)	Average Temp °F			Extreme High (°F)	Extreme Low (°F)	Peak Wind (mph)	Summer Rain (inches)	Average Temp. (Summer)
		June	July	Aug.					
Denali VC	1650	55.5	56.1	50.2	85	26	27	11.90	53.9
Toklat	2920	51.0	51.9	46.1	75	28	23	15.59	49.3
Eielson VC	3653	50.1	50.7	45.8	74	26	27	20.88	48.9
Wonder Lake	2050	54.3	55.1	48.9	85	30	44	13.63	52.8
Stampede	1800	53.7	54.5	48.7	87	25	12	9.83	52.3
Wigand	1741	54.6	55.7	49.6	85	30	35	8.36	53.3
Kantishna	1550	53.7	54.5	47.8	86	30	—	15.50	52.0
Dunkle Hills	3301	50.1	51.0	47.1	75	27	29	5.56	49.4
Ruth Glacier	2651	48.0	m	m	m	m	m	23.59	m
Tokositna Valley	850	55.1	55.3	50.9	83	30	—	15.6	53.8
14k Denali	14,000	14.4	18.1	13.7	48	-20	75	—	15.4

## Denali Summer Temperature Trend

The average summer temperature for 2015 was 52.5°F, which is 0.5°F cooler than the 1981-2010 normal (the latest climate normal period) and 0.1° F degrees cooler than the long-term average (1926-2015).

We calculate the average summer temperature by simply taking the average of June, July, and August monthly temperatures. The range in summer temperatures over the 89 year period of record is between 48.9°F (1971) and 58.6°F (2004). The overall trend is positive, but the temperature increase is non-linear, with multi-decadal variations.

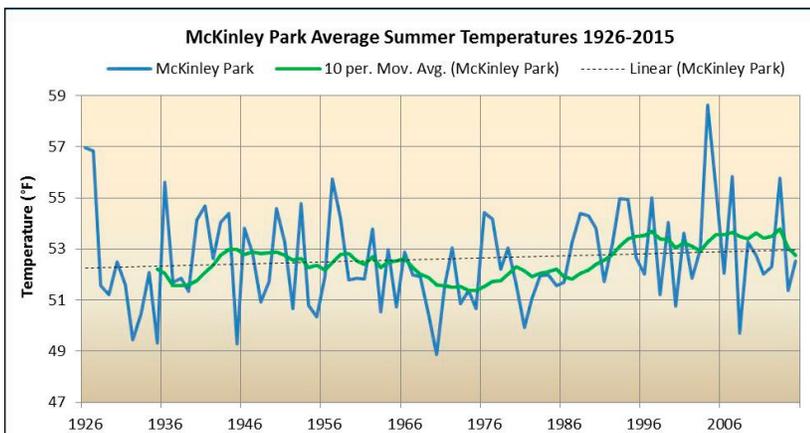


Figure 4. Average **summer temperatures** (June, July, August) at Denali Park Headquarters over the past 89 years. The green line shows a **10-year moving average**. The dotted line shows a simple linear regression trend.

## Denali Summer Rainfall

The total summer rainfall at park headquarters was 13.80 inches, normal is 8.08 inches. 2015 was the third wettest summer on record. 1967, with a total of 14.9 inches of summer rain, holds the record for the wettest summer. The second wettest summer was in 2002 with a total of 13.83 inches (Figure 5).

The total summer rainfall at Toklat was 15.59 inches making it the wettest summer since the station was installed a decade ago. Eielson and Wonder Lake both had the third wettest summer in a decade of measurements with 20.88 inches and 13.63 inches, respectively. Summer 2014 had higher summer rainfall totals for both of these sites.

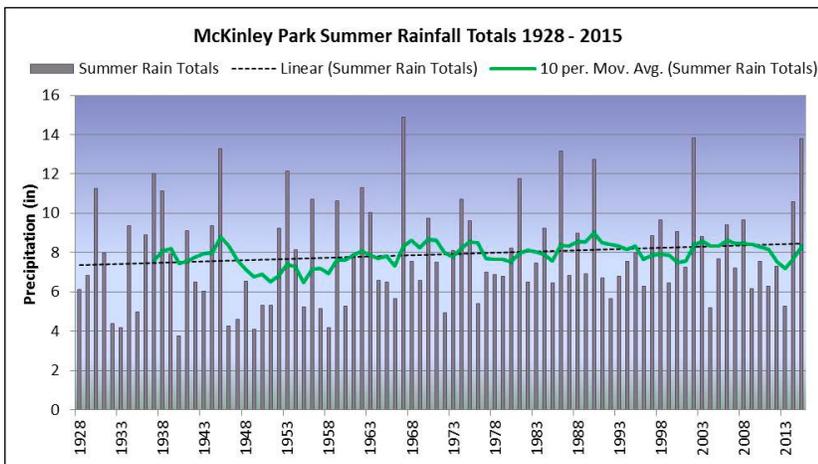


Figure 5. Average **summer rainfall** (June, July, August) at Denali over the past 89 years. The green line shows a **10-year moving average**. The dotted line shows a simple linear regression trend.

## Connecting Further

- Previous weather summaries and other climate monitoring documents on the [Central Alaska 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 Denali National Park and Preserve

### More Information

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