



Weather and Climate

Denali Fall 2014 Weather Summary



Denali Fall Weather 2014

In Denali, September temperatures were near normal and precipitation was slightly above normal. The average monthly temperature of 41.4° F was 1.0° F warmer than normal. The total rainfall for September was 2.25", which is 0.55" more than normal. 1.45" of rain was recorded on September 2, which broke the old record of 0.38" set in 1971. The low temperature of the month was 17° F recorded on both the 28th and 29th. Over two inches of snow accumulated the 29th – 30th.

October was cool and dry. The average air temperature was 3.4° F cooler than normal. 5.1" of snow fell October 4-6 which kept the snowpack alive despite monthly precipitation at 58% of normal. There was 5" of snow on the ground on Halloween. Minimum temperatures were below freezing each day of the month.

November was warm and dry. The monthly average temperature was 18.9° F, 10°F warmer than normal and the warmest November since 2002. The precipitation total for the month was only 0.05", the second driest November on record. Only 1953 (0.03") was drier.

All in all, the fall was warmer and drier than normal – the average fall temperature was 26.6° F, which is 2.5° F warmer than normal. Precipitation was 85% of normal with a total of 2.75 inches. There was 3 inches of snow on the ground at the end of November. Normal is 7.8 inches. (Figures 1 and 2; Tables 1 and 2)



Figure 1. Fall 2014 temperatures at park headquarters showing 2014 daily maximum/minimum, 1981-2010 normals, and record max/min.

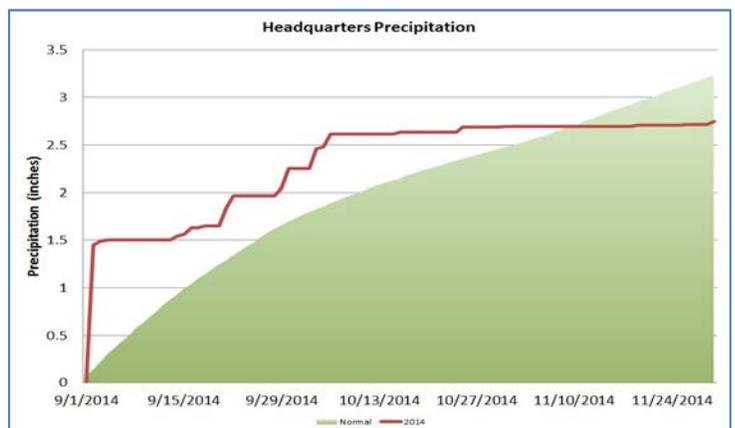


Figure 2. Fall 2014 accumulated precipitation at Denali (green) compared to normal (brown line).

Table 1. Temperature: Fall 2014 average monthly temperatures compared to the 1981-2010 normal.

Fall 2014	Average Monthly Temp °F	1981-2010 Normal °F	Departure from Normal °F	Monthly High °F / Date	Monthly Low °F / Date
September	41.4	40.4	+1.0	61 / Sep 10, 14, 15	17 / Sep 28, 29
October	19.5	22.9	-3.4	45 / Oct 3	-6 / Oct 29, 31
November	18.9	8.9	+10	47 / Nov 19	-8 / Nov 5

Fall Season Temperature Departure from Normal: +2.5° F

Table 2. Precipitation: Fall 2014 monthly precipitation totals compared to normal.

Fall 2014	Total Monthly Precip. in.	1981-2010 Normal in.	Departure from Normal in.	Greatest 24-hr. total in. / Date	# Days with >=0.01 in. water
September	2.25	1.70	+0.55	1.45 / Sep 2	11
October	0.45	0.78	-0.33	0.21 / Oct 4	6
November	0.05	0.75	-0.70	0.03 / Nov 30	3

Fall Season Departure from Normal: -0.48 inches; 85% of normal.

Fall 2014	Total Monthly Snowfall in.	1981-2010 Normal in.	Departure from Normal in.	Greatest 24-hr. snowfall total in. / Date	Cumulative snowfall since 1-July in.
September	2.4	4.7	-2.3	2.2 / Sep 30	2.4
October	7.3	9.9	-2.6	2.6 / Oct 4	9.7
November	1.9	13.2	-11.3	1.0 / Nov 26	11.6

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. This summer, University of Alaska researchers installed a weather station near 14,000' on Denali. Fall statistics from these sites are summarized in Table 4.

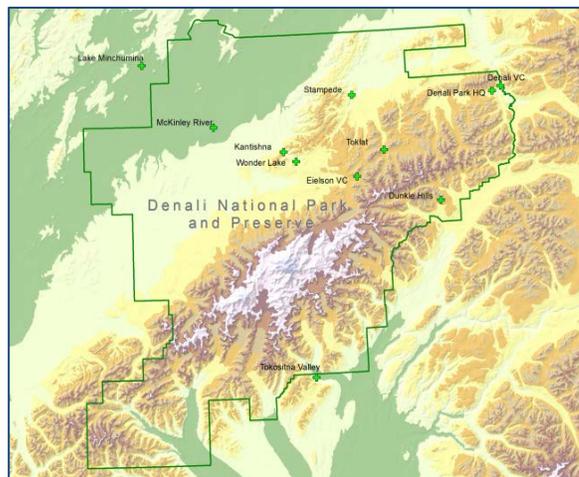


Figure 2. Locations of climate stations in Denali.

Denali Fall Temperature Trend

The average fall temperature for 2014 was 26.6° F, which is 2.5° F warmer than the 1981-2010 normal (the latest climate normal period) and 1.8° F degrees warmer than the long-term average (1925-2014). We calculate the average fall temperature by simply taking the average of September, October, and November monthly temperatures. The range in fall temperatures over the 88 year period of record is between 16.1° F (1932) and 35.1° F (2002). The overall trend is negative, but the temperature decrease is non-linear, with multi-decadal variations (Figure 4).

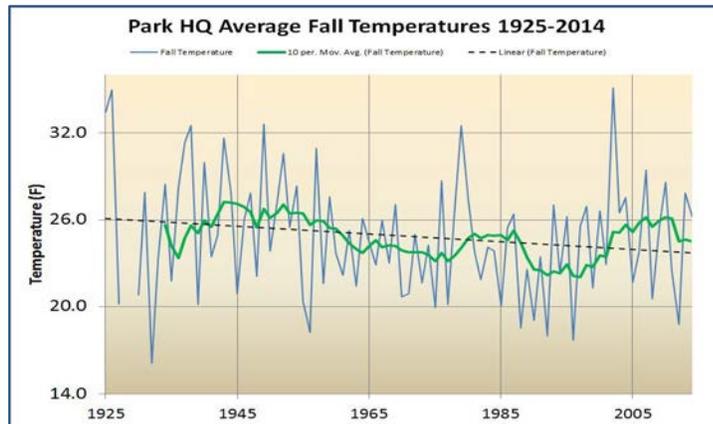


Figure 1. Average fall temperatures (September, October, November) at Denali Park Headquarters over the past 88 years. The green line shows a 10-year moving average. The dotted line shows a simple linear regression trend.

Table 4. 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)	Sept. Rain (inches)	Average Temperature
		Sept.	Oct.	Nov.					Fall Season (°F)
Denali VC	1650	42.9	19.4	16.3	64	-16	26	--	26.2
Toklat	2920	39.5	16.0	23.7	61	-10	30	4.42	26.4
Eielson VC	3653	40.8	21.6	31.3	61	0	42	4.11	31.2
Wonder Lake	2050	40.1	17.9	15.9	69	-11	37	3.97	24.6
Stampede	1800	40.0	18.6	12.5	70	-17	15	1.02	23.7
Wigand	1741	42.0	20.0	18.0	68	-9	36	1.80	26.7
Kantishna	1550	40.2	20.4	12.1	67	-15	--	3.8	24.2
Dunkle Hills	2651	M	22.5	19.9	M	-1	24	2.41	M
Tokositna Valley	850	44.7	30.0	26.6	63	-3	--	6.5	33.8
14k Denali	14,000	8.5	-6.2	-6.3	34	-26.5	93	--	-1.3

Interesting notes from RAWS stations:

- At Eielson, 3.0 inches of rain was recorded September 1-2. Over the same time period, 3.6 inches were recorded at Toklat and 2.7 inches at Wonder Lake. It was the wettest September at Toklat since records began in 2005.

- Amazingly, Toklat and Eielson were substantially warmer in November than October! At Eielson, the November mean of 31.3° F was 17.6° F warmer than the 2005-2013 average. November temperatures were also warmer than normal at lower elevations, but the warmth was not as anomalous. This persistent, strong, and warm inversion pattern occurred throughout much of interior Alaska in November 2014.

- Warm temperatures caused most of the snow to melt in the Eielson vicinity in mid-November. The snow depth sensor at the site recorded a depth of zero from November 19-24. A storm November 29-30 led to a depth of about 6 inches at the station by the end of the month.

- The peak wind gust for the season from the 14,000 ft station was 93 mph on September 3.

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
- [Map](#) of projected temperature and precipitation changes for Denali National Park and Preserve.

More Information

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