Weather and Climate

Denali Spring 2014 Weather Summary

Denali Spring Weather 2014

2014 was a warm, dry spring in Denali. March temperatures were warmer than normal, and snowfall was quite a bit below normal. The average temperature for March was 1.8° F warmer than normal During the first 10 days of the month the daily temperatures decreased steadily, followed by a warming event that persisted for five days. This year 2.5 inches of snow fell, compared to a normal of 6.8 inches. The total precipitation for the month was 0.27 inches, 69% of normal.

The average temperature for April was slightly above normal despite a brief cold snap April 8-11. There was only one day where measurable precipitation was recorded. Two inches of snow fell on April 8, with 0.01 inches of water content. Although this number is low, it is not all that unusual. There have been 12 years over the period of record when there was no precipitation recorded during the month of April.

Overall, May was warm and dry. The monthly average temperature was 2.3° F degrees warmer than normal; snowfall was 6 inches less than normal; and total precipitation was 55% of normal. Melt out at park headquarters occurred on May 6, right on schedule (May 6 is the 1981-2010 normal date for melt out). Total snowfall for the season was 54.3 inches, 22.5 inches below normal. This is low, but there are 23 snow years (July 1-June 30) on record with less snow (Figure 1 and 2; Table 1,2, and 3).

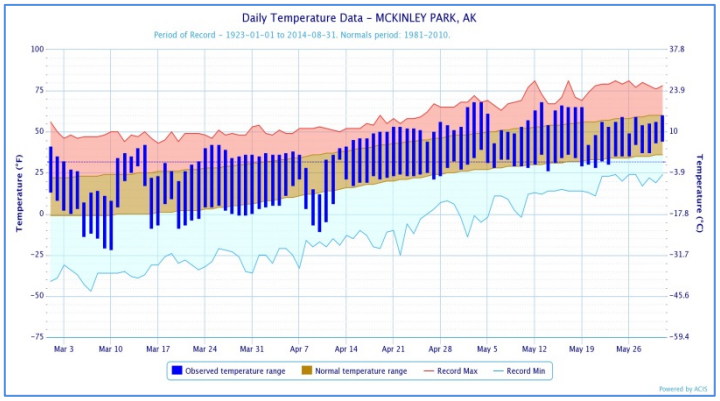

Figure 1. Spring 2014 daily temperatures at Denali showing record maximum (red), record minimum (blue), normal (brown) and 2014 observed range (blue bars).

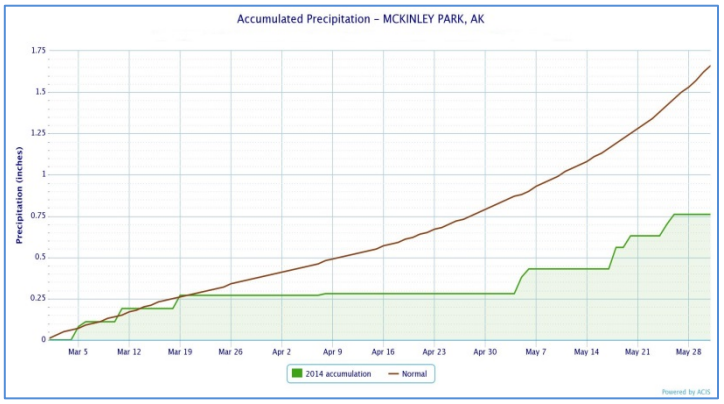

Figure 2. Spring 2014 accumulated precipitation at Denali (green) compared to normal (brown line).

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

Spring 2014	Average Monthly Temp °F	1981-2010 Normal °F	Departure from Normal °F	Monthly High °F / Date	Monthly Low °F / Date
March	15.2	13.4	+1.8	42 / Mar 15, 25, 26	-22 / Mar 10
April	28.9	27.9	+1.0	56 / Apr 28	-11 / Apr 10
May	45.1	42.8	+2.3	68 / May 3, 4, 13	26 / May 14

Spring Season Temperature Departure from Normal: +1.7°F

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

Spring 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
March	0.27	0.39	-0.12	0.08 / Mar 5, 11, 19	4
April	0.01	0.40	-0.39	0.01 / Apr 8	1
May	0.48	0.87	-0.39	0.13 / May 18	7

Spring Season Departure from Normal: -0.9 inches

Table 3. Snowfall: Spring 2014 monthly snowfall totals compared to normal.

Spring 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.	Snow Depth at end of month
March	2.5	6.8	-4.3	1.0 / Mar 5	53.1	14
April	0.2	6.1	-5.9	0.2 / Apr 8	53.3	5
May	1.0	3.1	-2.1	1.0 / May 7	54.3	0

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. The data are summarized in Table 4.

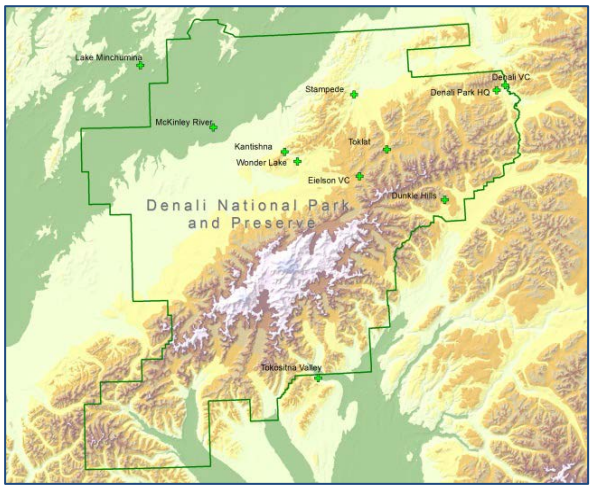

Figure 3. Locations of climate stations in Denali.

Figure 4. We use small aircraft to access many of these remote sites.

We visit the NPS stations during the summer months to do maintenance and basic repairs. During that annual trip we download the data from the data logger, swap sensors that need calibration, and field test sensors. The sites are accessible by road and small aircraft (Figure 4). We operate 30 climate stations that cover 40 million acres in the eight northern national parks of the Central Alaska and Arctic Inventory and Monitoring Networks.

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Table 4. Summary of weather statistics from the Denali climate stations.

Site	Elev. Ft.	Average Temp ° F Mar	Apr	May	Spring 2014 Avg. Temp °F	Extremes ° F High	Low	Peak Wind mph	High T – Low T
Denali VC	1650	14.8	31.3	46.5	30.9	73	-33	27	106
Toklat	2920	14.4	28.5	42.4	28.4	65	-24	39	89
Eielson VC	3653	19.8	29.4	41.3	30.2	59	-9	35	68
Wonder Lake	2050	13.2	29.9	45.1	29.4	67	-21	44	88
Stampede	1800	10.5	28.6	45.0	28.0	70	-35	14	105
Wigand	1741	13.7	30.6	46.3	30.2	68	-22	38	90
Kantishna	1550	9.8	29.8	45.7	28.4	69	-32	--	101
Dunkle Hills	2651	12.6	23.7	39.1	25.1	52	-21	34	73
Tokositna Valley	850	23.1	34.0	48.3	35.1	66	-7	--	73

Denali Spring Temperature Trend

The average spring temperature for 2014 was 29.7° F, which is 1.7° F warmer than the 1981-2010 normal (the latest climate normal period) and 2.6° F degrees warmer than the long-term average (1926-2014).

We calculate the average spring temperature by simply taking the average of March, April, and May monthly temperatures. Average spring temperatures show great variability with a range between 19.4° F in both 1971 and 1972 and 36.7° F in 1926.

The overall trend for spring temperatures is positive, but the temperature increase is non-linear, with multi-decadal variations. The 10-year moving average shows the warmest period in the late 1990s. The spring period over the past ten years has been cooler than the long-term average. (Figure 5)

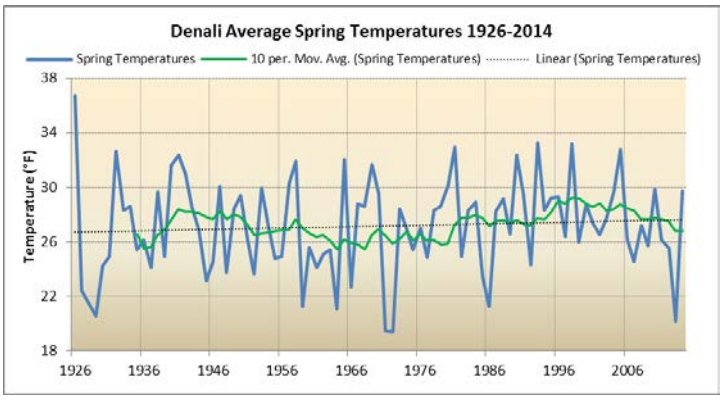

Figure 3. Average spring temperatures (March, April, May) at Denali Park Headquarters over the past 88 years. The green line shows a 10-year moving average. The dotted line shows a simple linear regression trend.

Connecting Further

- New paper published – Recent Sea Ice Increase and Temperature Decrease in the Bering Sea area, Alaska
- 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 Gates of the Arctic National Park and Preserve.

More Information

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