



Weather and Climate



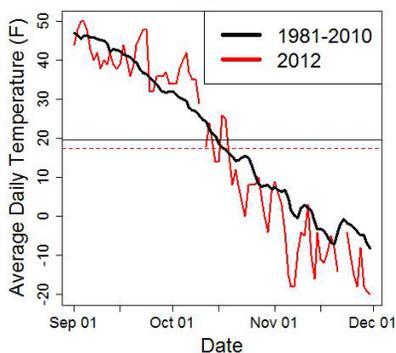
Gates of the Arctic Fall 2012 Weather Summary

What is Normal?

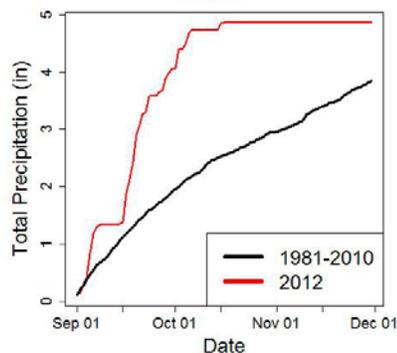
“Normals” are used to place recent climate conditions into historical context. It takes 30 years of continuous weather data at one location to calculate what makes temperatures or precipitation amounts “normal”. The weather station in Bettles has been in operation since 1944, and has a very good long-term record. Bettles is a good index site to use for climate comparisons in the Gates of the Arctic National Park and Preserve.

In Bettles, fall 2012 started out with temperatures right around normal, but it was quite wet. The average temperature for September was 40.9 °F, 0.3 °F warmer than normal. The total precipitation was 4.06 inches, which is 213% of normal. There were 23 days out of 30 with measurable precipitation. One daily record was broken on September 16th when 0.48 inches of rain fell. Temperatures remained near normal in October – the average monthly temperature was 18.6 °F, normal is 18.9 °F. The total precipitation for the month was 0.80 inches, normal is 1.04 inches. Only 2.1 inches of snow fell in October, 10.3 inches less than the normal. November was particularly cold and dry. It was 7.7 degrees F colder than normal and there was no measurable precipitation for the entire month. The normal precipitation total for November is 0.91 inches with 16.1 inches of snowfall. By November 30th the snowfall total is on average ~ 31 inches for the season; by November 30th 2012 only 3.0 inches had fallen for the season.

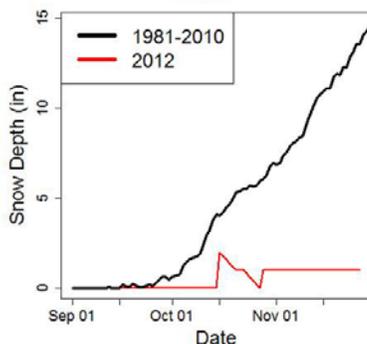
Bettles – Average Air Temperatures



Bettles – Cumulative Precipitation



Bettles – Cumulative Snow Depth



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Bettles Weather Records:

Climate Normal Period 1981 – 2010

Climate Record Period 1944 – 2012

Temperature

Fall 2012	Average Monthly Temp °F	1981-2010 Normal °F	Departure from Normal °F	Monthly High °F / Date	Monthly Low °F / Date
September	40.9	40.6	+0.3	57 / Sep 23	22 / Sep 25
October	18.6	18.9	-0.3	46 / Oct 5	-15 / Oct 23
November	-8.7	-1.0	-7.7	19 / Nov 1	-27 / Nov 30

Fall Season Temperature Departure from Normal: -2.6 °F

Precipitation

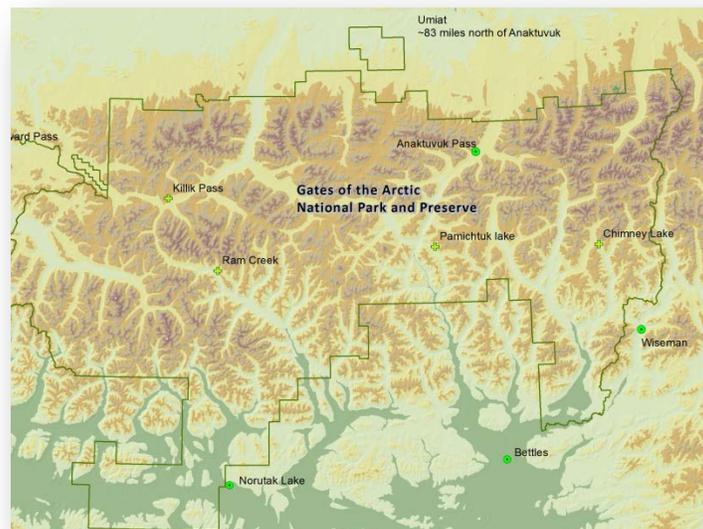
Fall 2012	Total Monthly Precip. in.	1981-2010 Normal in.	Departure from Normal in.	Greatest 24 –hr. total in. / Date	# Days with ≥ 0.01 in. rain or snow
September	4.06	1.91	+2.15	0.48* / Sep 16, 19	23
October	0.8	1.04	-0.24	0.33 / Oct 2	8
November	0	0.91	-0.91	0	0

* Daily record. Fall Season Departure from Normal: +0.3 inches

Snowfall

Fall 2012	Total Monthly Snowfall in.	1981-2010 Normal in.	Departure from Normal in.	Greatest 24 – hr. snowfall total in. / Date	2012 Cumulative since 1-July in.	Normal Snowfall from July 1 in.
September	0.9	2.5	-1.6	0.5 / Sep 30	0.9	2.5
October	2.1	12.4	-10.3	1.1 / Oct 15	3.0	14.9
November	0	16.1	-16.1	0	3.0	31.0

As part of the climate monitoring vital sign, we now have additional NPS climate stations in Gates of the Arctic National Park and Preserve that complement the existing National Weather Service station at Bettles. The 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 park. Data from Anaktuvuk Pass, Wiseman, and Umiat are also summarized.



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Gates of the Arctic weather summaries Fall 2012:

Site	Elev. Ft.	Average Temp °F			Fall 2012	Extremes °F		Snow Depth In. *	Peak Wind mph	High T – Low T °F **
		Sep	Oct	Nov	Avg Temp °F	High	Low			
Anaktuvuk Pass	2103	33.9	19.6	-6.7	15.6	52	-24	***	28	76
Wiseman	1290	39.7	16.8	-9.0	15.9	56	-28	0	***	84
Norutak Lake	800	38.5	18.0	-16.0	13.5	54	-28	***	23	82
Ram Creek	4110	26.3	14.1	4.5	15.0	38	-8	11.1	38	46
Killik Pass	4355	24.8	13.9	1.7	13.5	38	-17	3.4	34	55
Umiat	267	37.2	24.2	-6.2	18.4	64	-33.0	7.0	32	97

* Snow depth on Nov. 30th; ** Difference between the high and low temperature for the season; ***snow/wind not measured. Chimney Lake and Pamichtuk are currently not transmitting real-time data and were therefore not summarized.

Interesting notes from RAWS stations:

- The new station at Killik Pass had the lowest fall season average temperature at any of the weather stations analyzed around the national parks in the northern part of the state, including all of the Arctic and Subarctic parks.
- At the high elevation mountain sites the difference between the high and low temperatures for the season averaged ~ 50 degrees F, while the difference in the valley sites averaged ~ 85 degrees F.
- The temperature inversion becomes quite apparent ~ November when the average temperature at the new higher elevation sites in the park were ~ 13 degrees warmer than the lower valley sites.
- There was ~ a 23 degree F difference in the average monthly temperatures for October versus November as the available daylight (and heat) fade fast.



Climate station near Killik Pass.

Connecting Further

New paper published – [The First Decade of the New Century: A Cooling Trend for Most of Alaska](#)

[ARCN Weather and Climate Resource Brief](#)

Access near real-time data from [Western Regional Climate Center](#) and [MesoWest](#)

Check out the 3 month weather outlook from the [NOAA Climate Prediction Center](#)

Statewide summary of weather highlights in the latest [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.

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Please Note: The summarized data are preliminary and have not undergone final quality control. Therefore, these data are subject to revision.