



Quarterly Weather & Climate Summary Bering Land Bridge National Preserve Fall 2015

Nome Fall Weather

September was colder and drier than normal in Nome. The average temperature for the month was 40.0°F compared to a normal of 42.8°F. Only seven days of the month had average temperatures above normal. The coldest temperature recorded for the month was 18°F on September 22, a record for the date. 1.49 inches of precipitation fell during the month, which is 61% of normal. Measureable precipitation was only recorded on eight days in September.

Weather patterns shifted in October and all but three days were warmer than normal. Overall, the average monthly temperature was 34.3°F, 5.6°F warmer than normal and the eighth warmest October on record. Almost every day (except October 29-30) had maximum daily temperatures exceeding the freezing threshold. Precipitation was 153% of normal with 2.46 inches of water (rain or melted snow). More than half of that came in the first week of the month. The only significant snowfall occurred on Halloween with 2.0 inches of wet snow containing 0.61 inches of water.

With a monthly average temperature of 21.5°F, it was 4.6°F warmer than normal for November. A cold spell mid-month brought average daily temperatures down below zero on November 17, more than eighteen degrees colder than normal for the date. Warm temperatures and precipitation returned the last week of the month with about 6 inches of snow containing 0.5 inches of water and daily highs near the freezing mark (Figures 1 and 2; Table 1, 2, and 3).

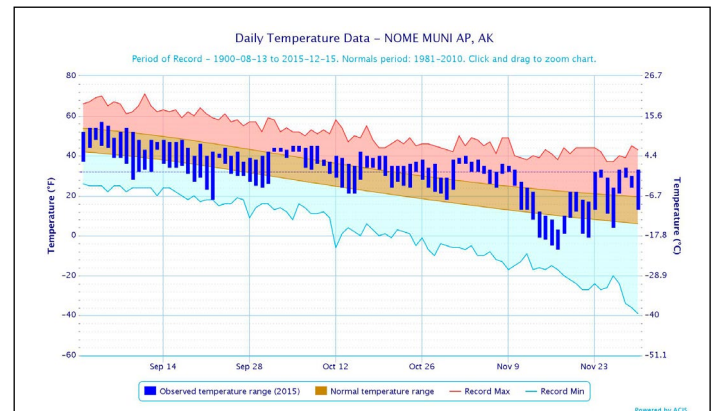


Figure 1. Fall 2015 daily temperatures at Nome showing **record maximum** (red), **record minimum** (blue), **normal** (brown) and **observed** range (blue bars).

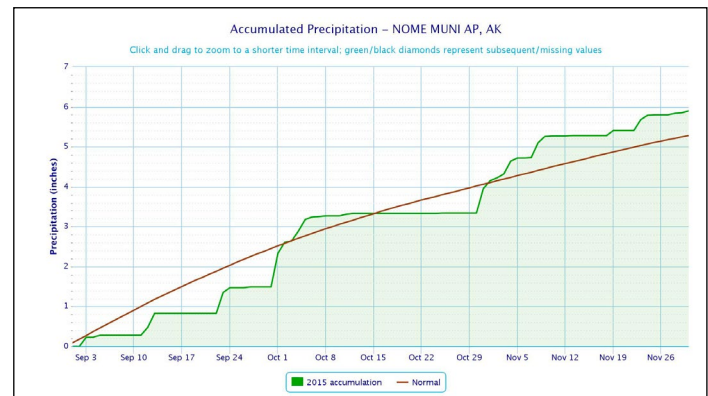


Figure 2. Fall 2015 accumulated precipitation at Nome (green) compared to **normal** (brown line).

Table 1. Temperature: Fall 2015 average monthly temperatures compared to the 1981-2010 normal.

Fall 2015	Average Monthly Temp (°F)	1981-2010 Normal (°F)	Departure from Normal (°F)	Monthly High (°F / Date)	Monthly Low (°F / Date)
September	40.0	42.8	-2.8	57 / Sept. 4	18 / Sept. 22
October	34.3	28.7	+5.6	45 / Oct 5, 6, 8, 9	18 / Oct. 30
November	21.5	16.9	+4.6	40 / Nov. 2	-7 / Nov. 17

Fall Season Temperature Departure from Normal: +2.8 °F

Table 2. Precipitation: Fall 2015 monthly precipitation totals compared to normal.

Fall 2015	Total Monthly Precip. (in.)	1981-2010 Normal (in.)	% of Normal	Greatest 24-hr. total (in. / Date)	# Days with ≥ 0.01 (in.) water
September	1.49	2.45	61%	0.52 / Sept. 23	8
October	2.46	1.61	153%	0.84 / Oct. 1	11
November	1.95	1.22	160%	0.37 / Nov. 8	17

Fall Season Precipitation Departure from Normal: +0.62 inches (112% of normal)

Table 3. Snowfall: Fall 2015 monthly snowfall totals compared to normal

Fall 2015	Total Monthly Snowfall (in.)	1981-2010 Normal (in.)	% of Normal	Greatest 24-hr snow-fall total (in. / Date)	Cumulative since 1-July (in.)
September	0.2	0.6	33%	0.2 / Sept. 27	0.2
October	2.4	4.6	52%	2.0 / Oct. 31	2.6
November	15.6	12.1	129%	4.3 / Nov 23	18.2

Fall Season Snowfall Departure from Normal: +0.9 inches (105% of normal)

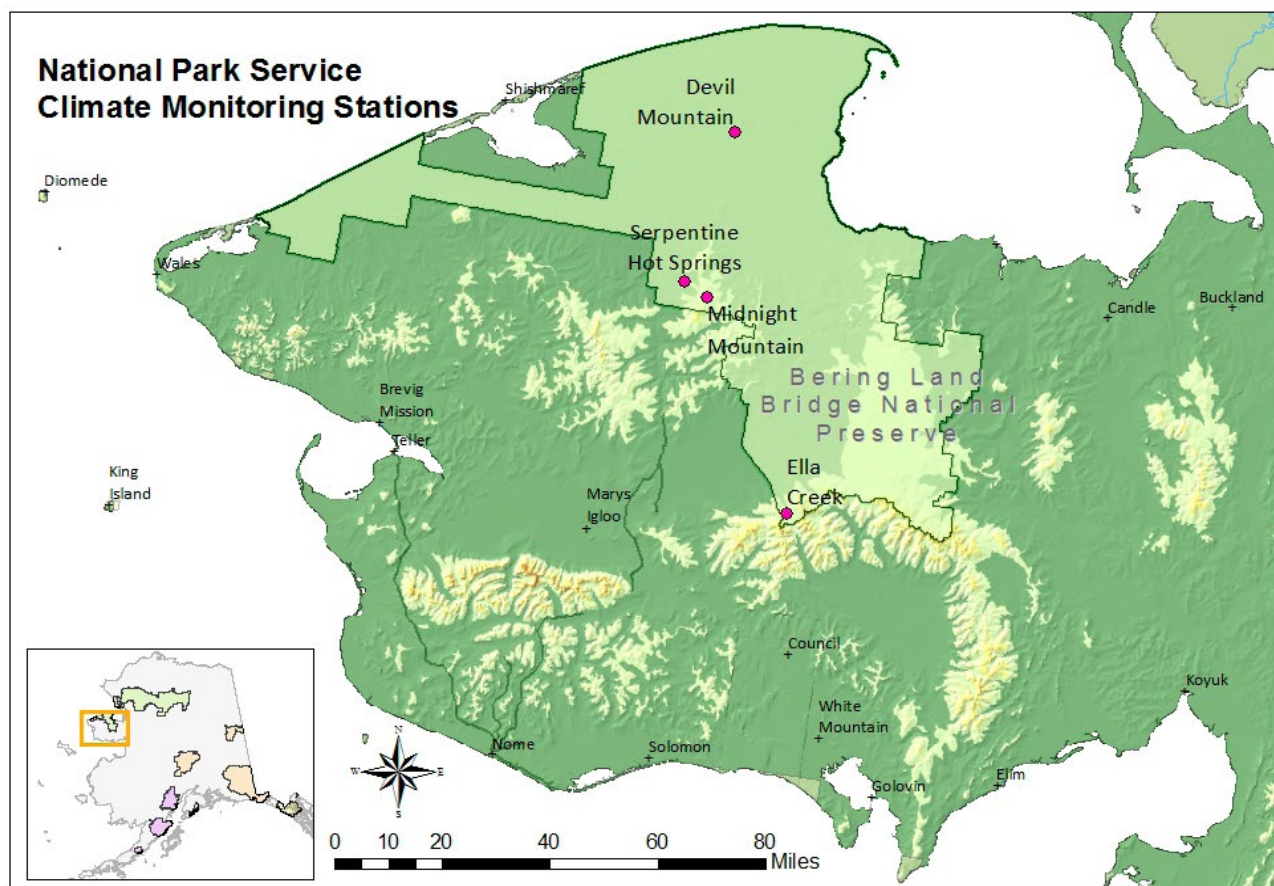


Figure 3. NPS climate stations in Bering Land Bridge National Preserve.

Long-Term Perspective

Temperature

The average fall temperature for 2015 was 31.9°F which is 2.8°F warmer than the 1981-2010 normal and 2.7° F warmer than the long-term record beginning in 1906. 2015 ranks as the 21st warmest fall on record.

We calculate the average fall temperature by simply taking the average of September, October, and November monthly temperatures. Average fall temperatures show great variability with a range between 22.5°F in 1948 and 36.3°F in 1926 (Figure 4).

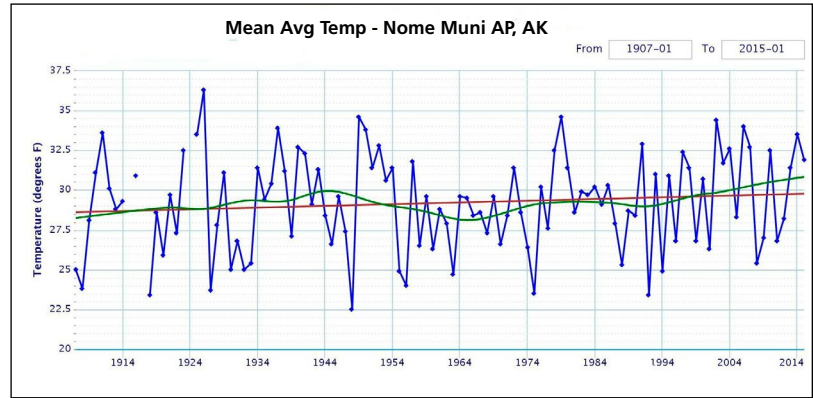


Figure 4. Average fall temperatures (September-November) at Nome since 1907. The green line is locally weighted scatterplot smoothing (LOESS). The brown line is a simple linear regression.

Precipitation

Fall precipitation in 2015 was 5.90 inches which is 0.62 inches more than the 1981-2010 normal and 0.90 inches more than the long-term record beginning in 1906. 2015 ranks as the 35th wettest fall on record.

Fall precipitation is highly variable with a range between 0.54 inches in 2008 and 11.72 inches in 1935 (Figure 5).

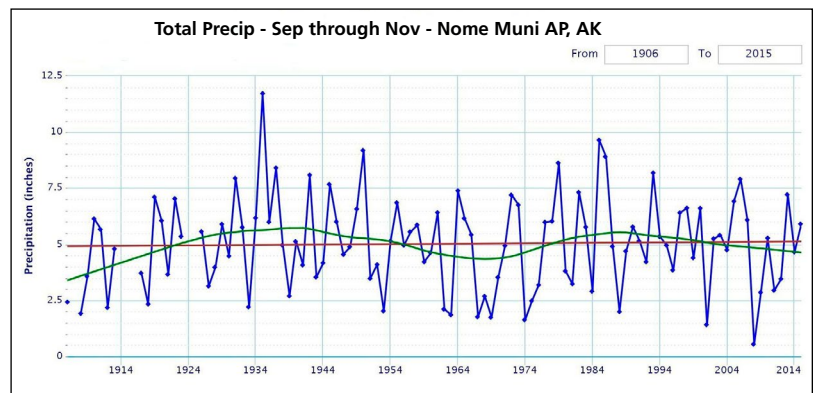


Figure 5. Fall (September-November) precipitation totals at Nome since 1907. The green line is locally weighted scatterplot smoothing (LOESS). The brown line is a simple linear regression.

Rime Ice

Rime ice forms when supercooled water droplets freeze to the outer surfaces of exposed objects. Rime usually forms during weather conditions with some wind (> 5 mph), high relative humidity (often fog), and relatively mild temperatures (10-30°F). Weather stations are prime targets for riming (unfortunately) because of their exposed location above the ground surface. Rime is usually white in color and less dense than freezing rain or glaze.

ARCN weather stations do not directly measure any form of ice, but rime formation and persistence can be inferred through wind speed, air temperature, relative humidity, and other measurements. The easiest way to identify potential riming events is to monitor the wind speed sensor. When rime ice forms on the sensor, the propeller stops spinning and the sensor incorrectly records measurements of zero (Figure 7).

Rime ice may have formed at stations across the Seward



Figure 6. An extreme rime ice example at the Midnight Mountain meteorological station in 2012. The ice encased and destroyed the 10-foot tall tripod. The station was downsized in 2013 and now only measures air and soil temperatures. (photo Walker Gusse)

Peninsula in fall 2015. Air temperatures from 15-25°F, high relative humidity (90-100%) and moderate wind speeds (5-20 mph) were measured at most stations in early November. Following these meteorological conditions, some wind sensors began recording values of 0 mph, indicating that the propellers may have been affected by icing.

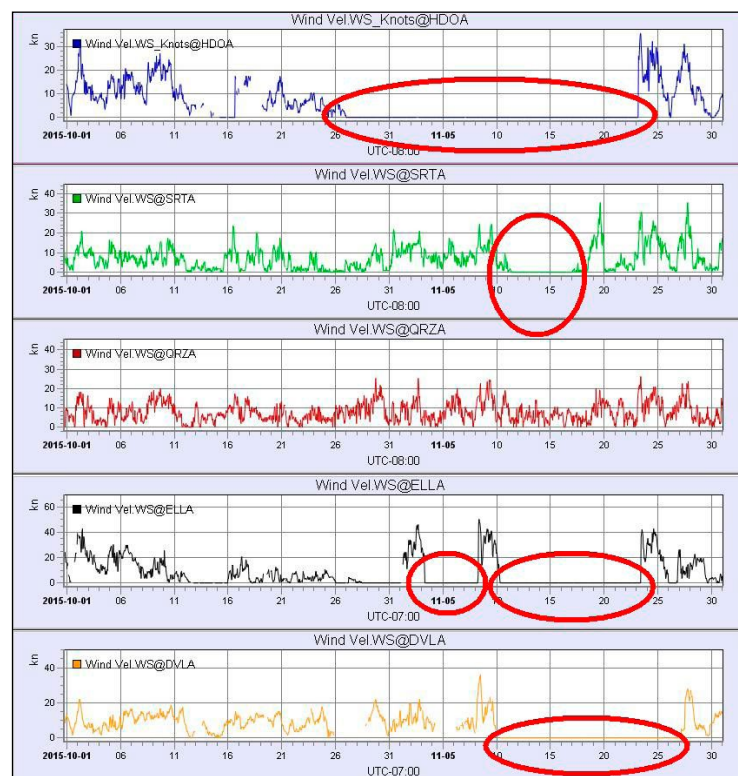


Figure 7. Wind speed at Hoodoo Hills (top; blue), Serpentine (green), Quartz Creek (red), Ella Creek (black) and Devil Mountain (bottom; yellow) for fall 2015. Circled areas indicate time periods of potential rime ice. Please note: all data are preliminary and subject to review.

In total, icing on the wind sensor may have persisted for 2-4 weeks at Devil Mountain, Hoodoo Hills, and Ella Creek (Figure 3) in fall 2015. Serpentine Hot Springs station may have been affected for a shorter time frame – about 1 week in mid-November. The wind sensor at Quartz Creek was not affected, which indicates that icing may not have occurred at that location.



Figure 8. Rime ice at the downsized Midnight Mtn station in September 2014. During the formation of the ice, wind was blowing from left to 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](#)
- The 2015 [Arctic Report Card](#) was recently released. Highlights include updated trends on sea ice, air temperature, snow cover, ocean temperatures, wildlife, and vegetation.

- [Maps](#) of projected temperature and precipitation changes for Bering Land Bridge National Preserve.

More Information

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