# Weather and Climate

## *Bering Land Bridge Fall 2014 Weather Summary*

## Nome Fall Weather 2014

September was warmer than normal and precipitation was above average in Nome. The average temperature for September was 45.3° F compared to a normal of 42.8° F. The temperature rose to 65° F on September 12, breaking the old record high for the date set in 1979. 2.58 inches of rain fell in September, compared to a normal of 2.45 inches.

October was dry, and a little warmer than normal overall. The average temperature for the month was 29.1° F compared to a normal monthly mean of 28.7° F. No precipitation was recorded the first three weeks of the month. With only 0.63 inches of precipitation (water equivalent), October ended up at 39% of normal for the month. Snowfall, however, was near normal with 4.9" measured, just 0.3" less than normal. 3.6" of snowfall was measured on the 23rd, a record for the date.

It was the second warmest November since 1907. High temperatures were above normal for 23 out of 30 days. The average temperature of 26.2° F for the month was 9.3° F warmer than normal. Four out of five days for the November 13-18 period broke record high temperatures. 1.44 inches of rain fell in November compared to a normal of 1.22 inches. More than half of the monthly precipitation total came in about 10 inches of snowfall during the last week of the month.

The average fall temperature at Nome was 33.5° F which is 4.1° F warmer than the 1981-2010 normal and 4.4° F warmer than the long term average since 1907 (see Figure 5). The total fall precipitation was 4.65 inches, 88% of normal (Figures 1 and 2; Table 1, 2, and 3).

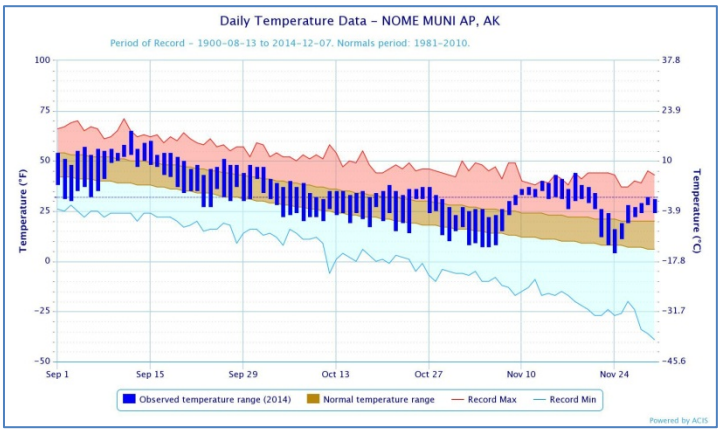


Figure 1. Fall 2014 daily temperatures at Nome showing record maximum (red), record minimum (blue), normal (brown) and **2014 observed** range (blue bars).

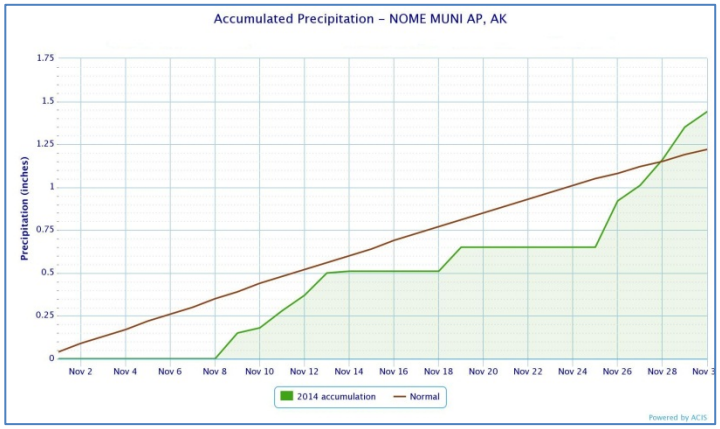


Figure 2. Fall **2014** accumulated precipitation at Nome (green) compared to **normal** (brown line).

**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** | 45.3 | 42.8 | +2.5 | 65 / Sept. 12 | 27 / Sept. 23, 24 |
| **October** | 29.1 | 28.7 | +0.4 | 47 / Oct. 1, 2 | 10 / Oct. 30 |
| **November** | 26.2 | 16.9 | +9.3 | 44 / Nov 18 | 4 / Nov 24 |

Fall Season Temperature Departure from Normal: +4.1°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** | 2.58 | 2.45 | +0.13 | 0.54 / Sept. 1 | 15 |
| **October** | 0.63 | 1.61 | -0.98 | 0.35 / Oct. 23 | 4 |
| **November** | 1.44 | 1.22 | +0.22 | 0.27 / Nov 26 | 12 |

Fall Season Precipitation Departure from Normal: -0.63 inches (88% of normal)

**Table 3. Snowfall: Fall 2014 monthly snowfall totals compared to 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** | 0 | 0.6 | -0.6 | - - | 0 |
| **October** | 4.9 | 4.6 | +0.3 | 3.6 / Oct. 23 | 4.6 |
| **November** | 12.7 | 12.1 | +0.6 | 3.4 / Nov 26 | 17.6 |

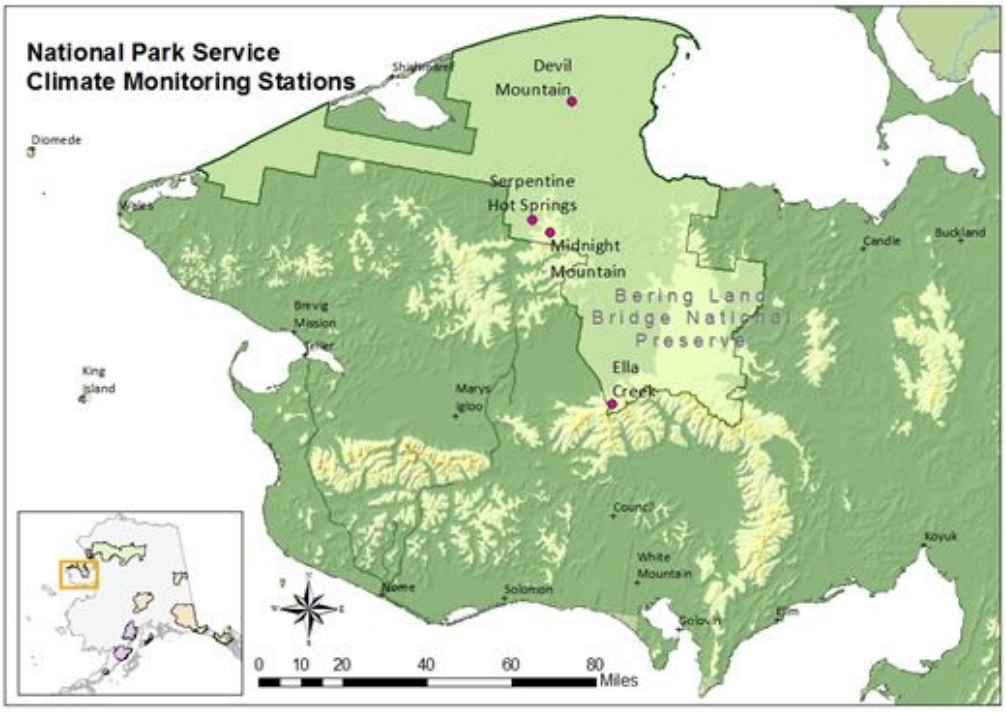


Figure 3. NPS Climate stations in Bering Land Bridge National Preserve.

Table 4. Summary of weather statistics from the Bering Land Bridge climate stations. All data are preliminary and subject to review.

| Site | Elev. (ft) | Average Temp °F | | | Extreme High | Extreme Low | Peak Wind | September Rain | Average Temperature |
|---|---|---|---|---|---|---|---|---|---|
| | | Sept. | Oct. | Nov. | (°F) | (°F) | (mph) | (inches) | Fall Season (°F) |
| Devil Mtn | 285 | 41.5 | 26.8 | 20.6 | 57 | 2 | 40 | 2.02 | 29.6 |
| Ella Creek | 2260 | 38.4 | 20.2 | 22.4 | 53 | 0 | 69 | 2.73 | 27.0 |
| Hoodoo Hill | 1495 | 40.0 | 22.4 | 18.4 | 57 | -1 | 59 | 2.83 | 26.9 |
| Quartz Creek | 321 | 42.6 | 26.5 | 20.9 | 65 | -7 | 39 | 1.97 | 30.0 |
| Serpentine | 518 | 42.5 | 26.9 | 23.8 | 62 | -7 | 43 | 2.43 | 31.1 |

**Interesting notes from RAWS stations:**

- Serpentine was the warmest station on average for fall 2014 (31.1° F). However, in 2013, Quartz Creek was the warmest station (29.1° F) and in 2012, Devil Mtn. was the warmest (25.2° F).

- The snow depth sensor at Serpentine was reporting less than one inch of snow as of November 30. High winds (gusts to 43 mph) on November 21 may have scoured the shallow snowpack (~2 to 4 inches) that had established November 19-20.

- Ella Creek was the windy spot once again. The peak gust for fall 2014 was 69 mph on November 19. The 2013 fall season peak was on November 13 (76 mph), and the 2012 peak occurred on October 5 (65 mph).

## Climate Monitoring in Bering Land Bridge National Park and Preserve

We now have additional NPS climate stations in Bering Land Bridge that complement the long-term record from the National Weather Service station in Nome. The new NPS stations will provide critical data for the Seward Peninsula which will help characterize the climate gradients and patterns affecting resources in Bering Land Bridge National Preserve. Table 4 summarizes the fall data for the new sites.

We have added phenology cameras to some of the climate stations (Figure 4). These cameras capture images four times per day; the images are downloaded once a year. The images are used to help quantify the snow season, green-up period, and other basic phenologic information.

There was very little snow on the ground in mid-winter in the interior Seward Peninsula. Figure 4 shows selected images captured from the camera in 2013-2014.


Figure 4. Selected images from Serpentine Hot Springs time lapse camera from August 2013 – April 2014.

## Nome Fall Temperature Trend

The average fall temperature for 2014 was 33.5° F which is 4.1° F warmer than the 1981-2010 normal and 4.4° F warmer than the long-term record beginning in 1907. 2014 was the ninth 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 22.7° F in 1948 and 36.3° F in 1926.

There is no statistically significant trend in fall temperatures based on a simple linear regression ($p>0.01$). The overall trend is positive, but the temperature increase is non-linear, with multi-decadal variations. The 10-year moving average shows a strong warming starting in the mid-1990s. (Figure 5)

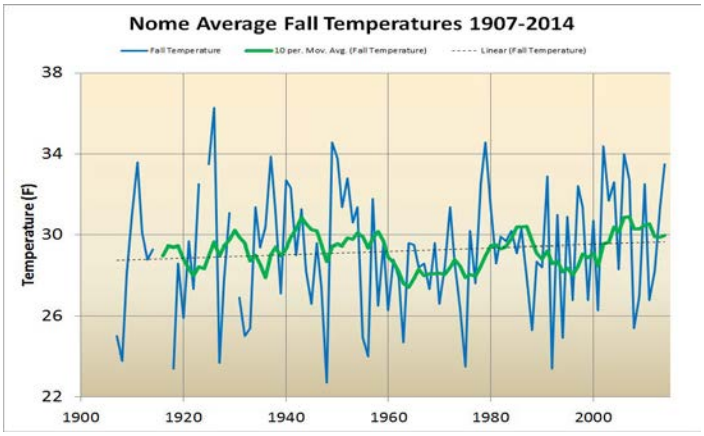


Figure 5. Average fall temperatures (September, October, November) at Nome since 1907. The green line is a 10-year moving average. The dashed line is a simple linear regression.

## Connecting Further

- New paper published – Consistency and Lack Thereof in Pacific Decadal Oscillation Impacts on North American Winter Climate.
- 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
- 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 Bering Land Bridge National Preserve.

## More Information

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