



Alagnak

Aniakchak

Katmai

Kenai Fjords

Lake Clark

Climate at Lake Clark NPP

The Lake Clark region, located in southcentral Alaska, has two distinct climates that are divided southwest to northeast by the Alaska and Aleutian mountain ranges. To the southeast, the Cook Inlet and the Pacific Ocean significantly influence the climate of the region by moderating the transfer of energy and water vapor to and from the atmosphere resulting in a maritime climate. To the northwest, the mountains form a barrier, resulting in climate patterns more typical of Alaska's western interior that are sometimes influenced by the moderating effects of the Bristol Bay to the southwest. Figure 1 provides examples of how mean annual monthly temperatures vary relative to their locations: Silver Salmon (maritime) is more moderate, Chigmit Mountains (higher elevation) is colder, and Snipe Lake (interior) has greater extremes.

Recent winter temperatures have frequently been out of the normal range. Regionally, 2014 and 2015 were the warmest years on record. In Port Alsworth, the recent temperatures for winter and spring months have frequently been near the maximums for the period of record, and 2014 and 2015 have been the hottest years on record. Notably, three of the 10 warmest winters, one of the 10 warmest springs, and seven of the 10 warmest maximum three-day temperature extremes since 1960 have occurred in the last 10 years (Lindsay 2014).



NPS/P. Kirchner

Weather station in the Chigmit Mountains of Lake Clark National Park and Preserve.

Weather Highlights

- 2014 and 2015 were the warmest years on record.
- 2014 and 2015 winter and spring maximum temperatures at Port Alsworth were the hottest years on record.
- Three of the ten warmest winter seasons have occurred in the last 10 years.
- One of the ten warmest spring seasons have occurred in the last 10 years.
- Seven of the ten warmest maximum three-day extremes since 1960 have occurred in the last 10 years.

How climate and weather are different can be summed up by the phrase: climate is what you expect; weather is what you get. *Weather* refers to atmospheric conditions over short periods of time, typically days to weeks. *Climate* refers to the patterns (statistics) of weather over long periods of time, typically 30 years. *Climate change* refers to changes in climate patterns over long periods of time.

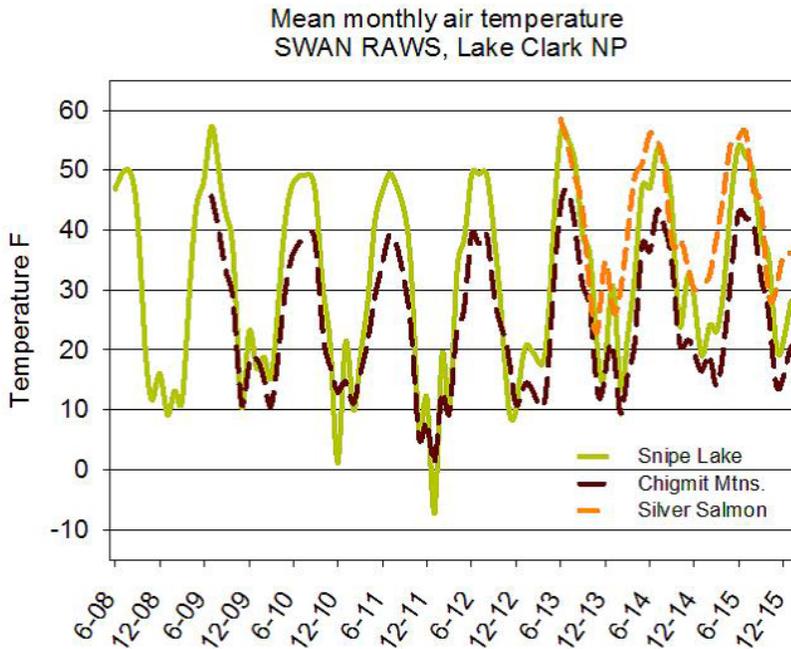


Figure 1. Mean monthly air temperatures for Lake Clark weather stations show climatic differences between Silver Salmon where temperatures are moderate, Chigmit Mountains (the coldest and highest elevation), and Snipe Lake, with the greatest extremes. All show a distinct warming trend, especially in winter, over the past four years (Western Regional Climate Center).

Predictions of future climate, based on conservative model projections, indicate a 3-6°F (1.5-3°C) warming trend over the next 100 years in addition to the warming trend already observed (Figure 2; Monahan and Fisichelli 2014, SNAP 2016). The most warming is predicted to occur during the winter months and will continue to

increase the number of days when the temperature is at or above 32°F (0°C); thus, over the long term, precipitation will continue to fall more frequently as rain than snow, snow elevations will rise, and snow will melt earlier and more often—a pattern seen in much of southwest Alaska over the past two years.

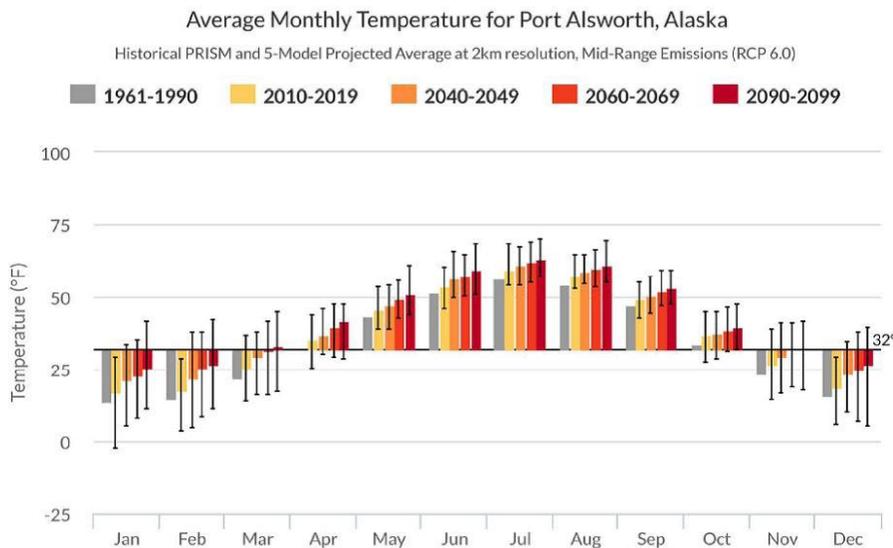


Figure 2. 100 years of average monthly temperature changes, and quantified ranges, based on conservative modeled climate projections (Scenarios Network for Alaska and Arctic Planning [SNAP] 2016).

References

Monahan, W. B. and N. A. Fisichelli. 2014. Climate exposure of U.S. national parks in a new era of change. *PLoS ONE* 9(7): e101302. doi:10.1371/journal.pone.0101302.

Scenarios Network for Alaska and Arctic Planning, University of Alaska. 2016. Available at: snap.uaf.edu/sites/all/modules/snap_community_charts/charts.php (accessed March 17, 2016)

More Resources

Alaska's Climate

accap.uaf.edu/

www.snap.uaf.edu/

www.aos.org/

Snow and Climate

nsidc.org/cryosphere/snow/climate.html

Climate and Sea Surface Temperatures

www.ncdc.noaa.gov/teleconnections/pdo/

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