

Towards Climate Adaptation Planning—Seasonal Climate for Northern Nevada

NC STATE

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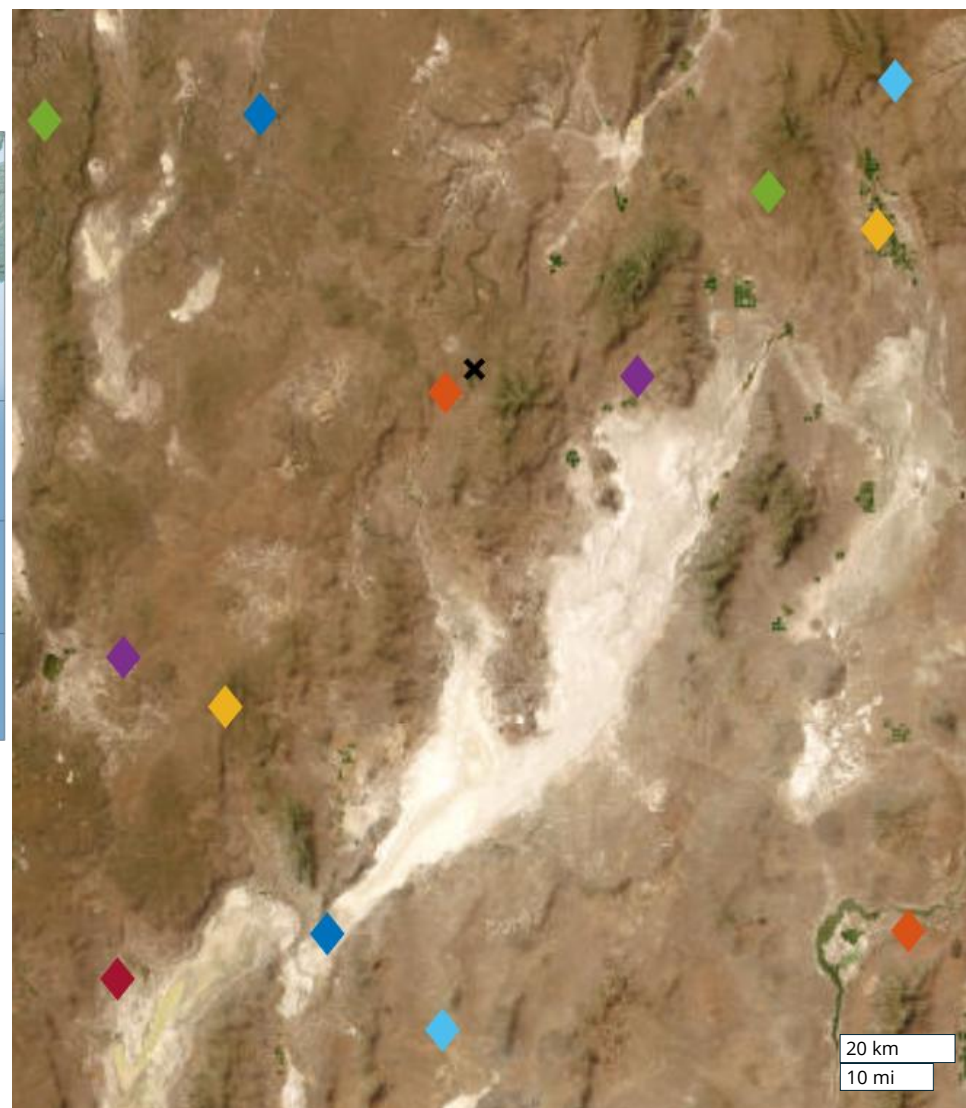
Motivation

In order to plan for adaptation, the Summit Lake Paiute Tribe in Northern Nevada wants an assessment of recent climate changes over the last few decades as well as expected changes between now and 2100. The complex basin and range topography of Northern Nevada are smoothed in weather and climate models making forecasting for this region less reliable than for the gentler terrain of the eastern US.

Study Region



US Topographic Map
Summit Lake in Northern Nevada has an elevation of 5,910ft (1800m) above sea level and is situated in the Great Basin Desert Region

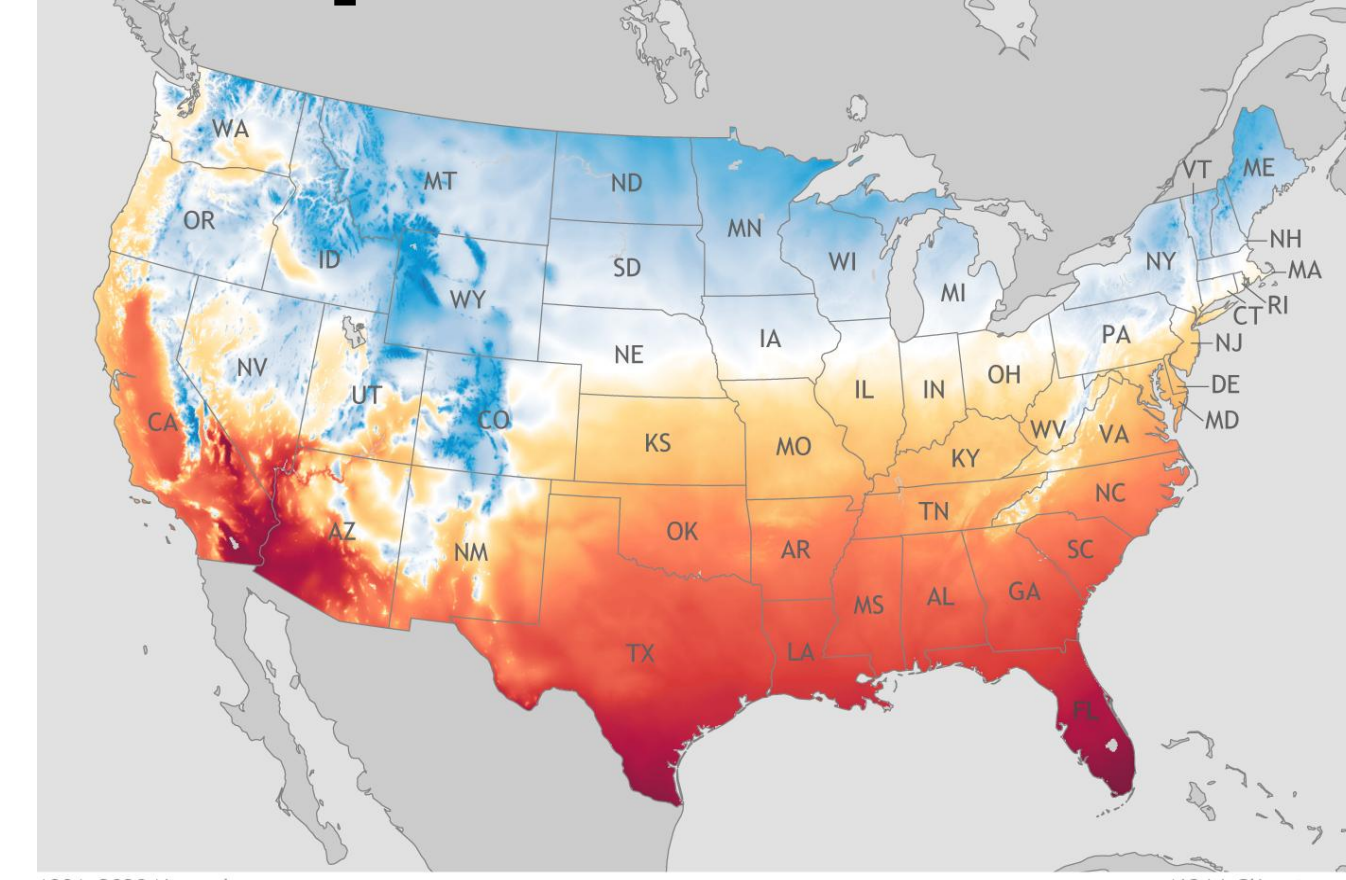


Locations of weather stations in the region

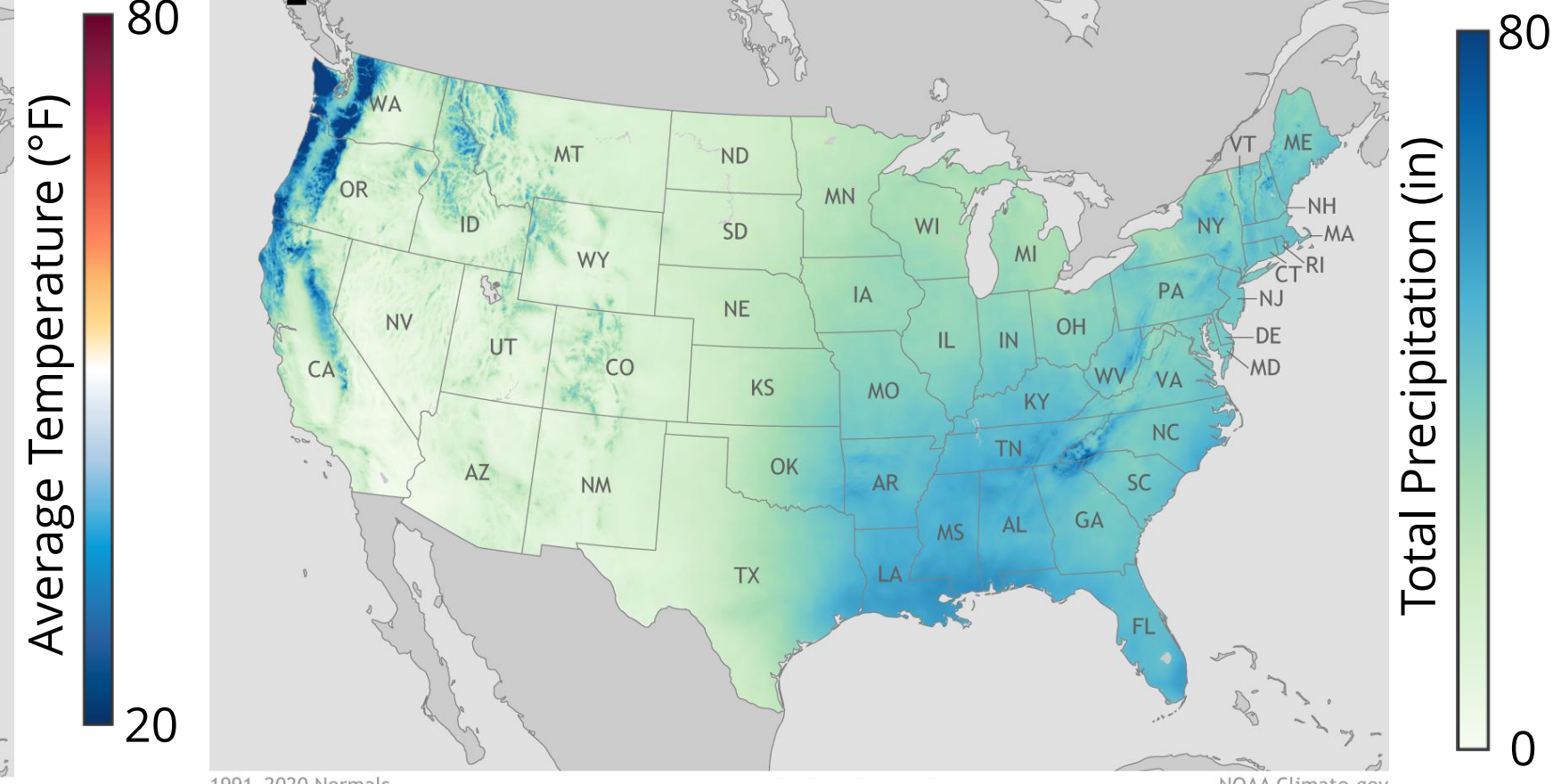


Photograph of Summit Lake

Average Annual Temperature and Precipitation



Source: NOAA Climate.gov



Source: NOAA Climate.gov

Based on these maps, for the Summit Lake region, the average annual⁽¹⁾ temperature is 45°F and the average annual rainfall is 10 inches.

Data and Methods



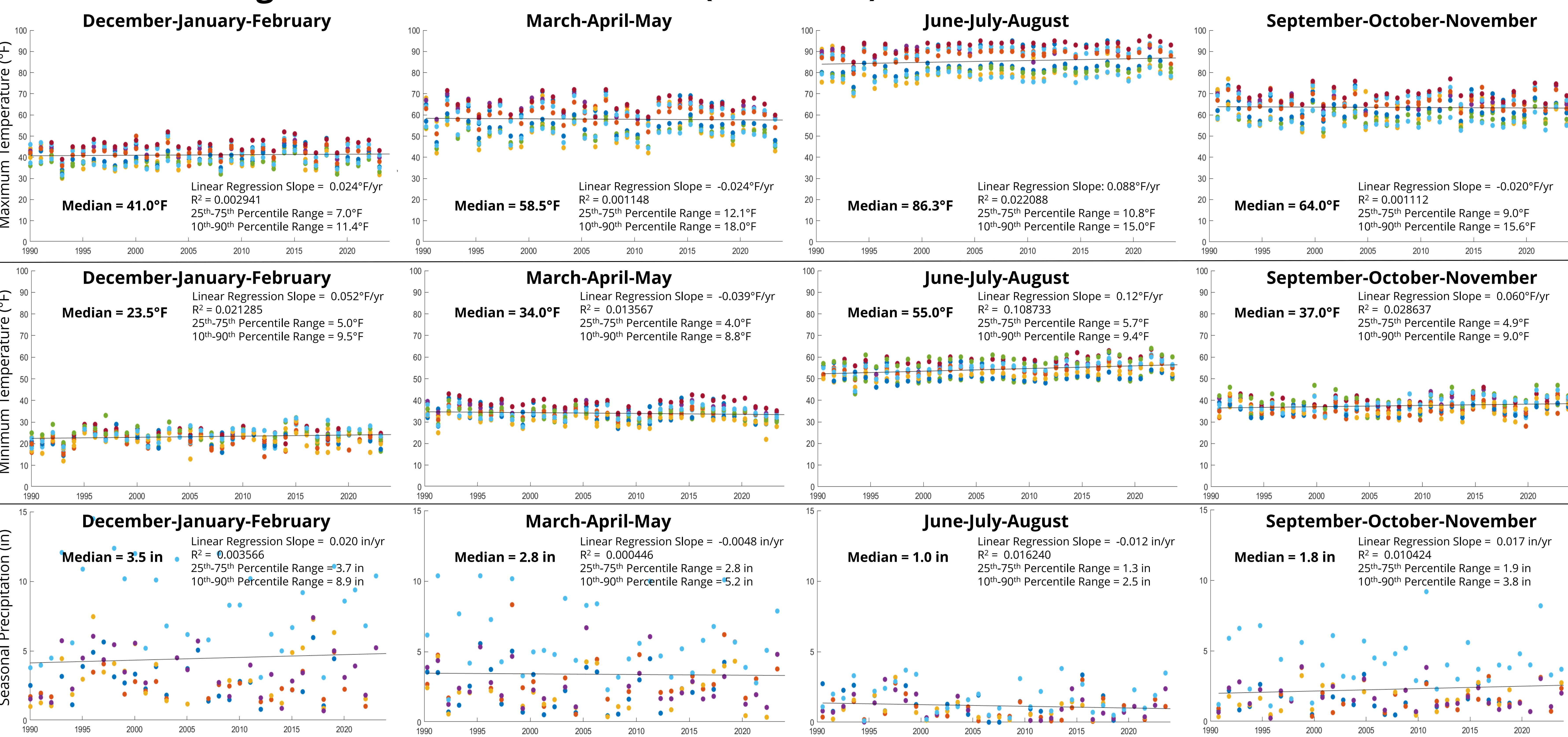
Summit Lake
Paiute Reservation
Weather Station⁽²⁾
Source: summitlaketribe.org

We examine key climate indicators that impact the environment, ecology, and people:

- Daily Minimum Temperature
- Daily Maximum Temperature
- Daily Precipitation

This data is obtained from Global Historical Climatology Network (GHCN)⁽³⁾ weather stations in the region. Thirteen weather stations in Northern Nevada have nearly complete records for 1990-2024. A data set is considered representative for a given 3-month season if it has at least 90% of days recorded for each variable. Statistical analysis yields information on potential trends and variability.

Summit Lake Region Seasonal Observations (1990-2024)



Summary and Future Work

- No clear trends in minimum and maximum seasonal temperatures for 1990-2024
- Precipitation has large year-to-year variability, especially during the winter months, but has no clear trends for 1990-2024
- Next steps are to examine two different scenarios for 2025-2100 based on moderate and high future greenhouse gas emissions using 32 different climate models (Cal-Adapt LOCA) to assess likely future trends and variability in temperature and precipitation.

References

- (1) NOAA Climate. (2021, October 11). *U.S. annual average temperature and precipitation (1991-2020)* [Online Image]. Climate.gov. <https://www.climate.gov/news-features/featured-images/new-maps-annual-average-temperature-and-precipitation-us-climate>
- (2) Summit Lake Paiute Tribe. (n.d.) *Weather* [Photograph]. <https://www.summitlaketribe.org/weather.html>
- (3) NOAA Global Historical Climatology Network Daily (GHCN): <https://www.ncdc.noaa.gov/products/land-based-station/global-historical-climatology-network-daily>

Acknowledgements

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