

A REPORT ON CALIFORNIA'S CLIMATE
By Jennifer Truong

1 INTRODUCTION

Looking forward to moving to a new home in California? Well, you're in luck! Due to its nice Mediterranean climate, many people pick California as the most popular state to live in the long term. We are glad that you are considering living in California.

However, because it is such a large state, not all parts of California are the same. Some cities in California are in the hottest desert regions, while some are more located in colder, mountainous areas. The climate of the city that you decide to live in will depend on its location within the state (whether it is closer to the ocean or further inland).

The purpose of this report is to take a closer look at the climate norms (particularly monthly average high temperatures) throughout the state to help you determine the best place to live in California that matches your preferences. With that said, let's begin.

2 METHODS

The climate data for California was provided by NOAA's Climate Data Online database. We used Inverse Distance Weighting (IDW) interpolation analysis in ArcGIS to generate a temperature map predicting high monthly temperatures throughout the state using observations from weather stations. Distance from neighboring stations was somewhat weighted heavily in the calculations. After generating the results from the analysis, zonal statistics were used to determine predicted temperatures for individual cities.

3 A LOOK AT CALIFORNIA'S WINTER CLIMATE

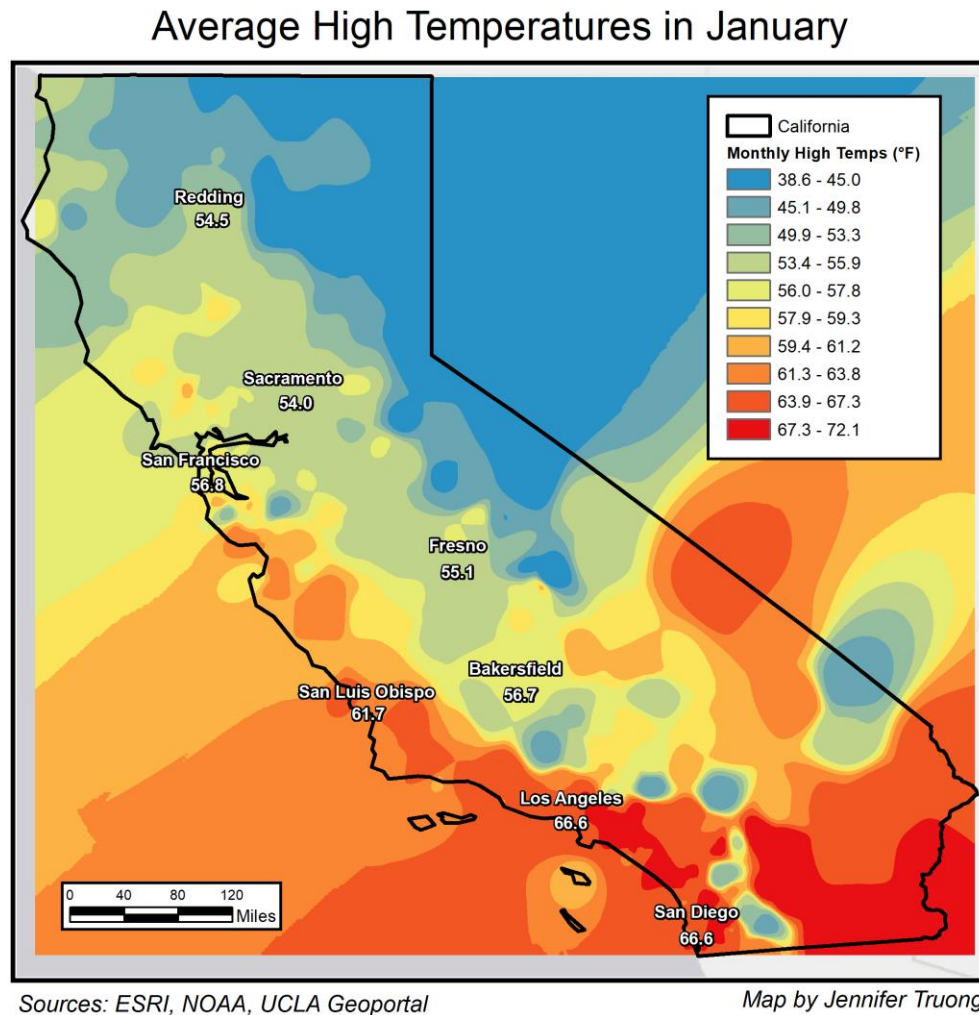


Figure 1. A map showing the predicted average high temperatures for January using IDW interpolation.

The cities on the southern and central coasts (San Luis Obispo, Los Angeles, and San Diego) have average high temperatures ranging between 60 and 65 degrees Fahrenheit for the month of January. San Francisco, another major city, is the only coastal city in this map that has average temperature less than 60 degrees. Cities that are further inland in the Central Valley, such as Fresno and Bakersfield, have average high temperatures ranging between 55 and 57 degrees. Sacramento and Redding are also further inland from the coast, and yet their average monthly highs are only about one to two degrees lower in comparison to Fresno and Bakersfield.

Below are two tables containing the ten warmest and ten coolest cities for the month of January, which do not include the major cities mentioned earlier.

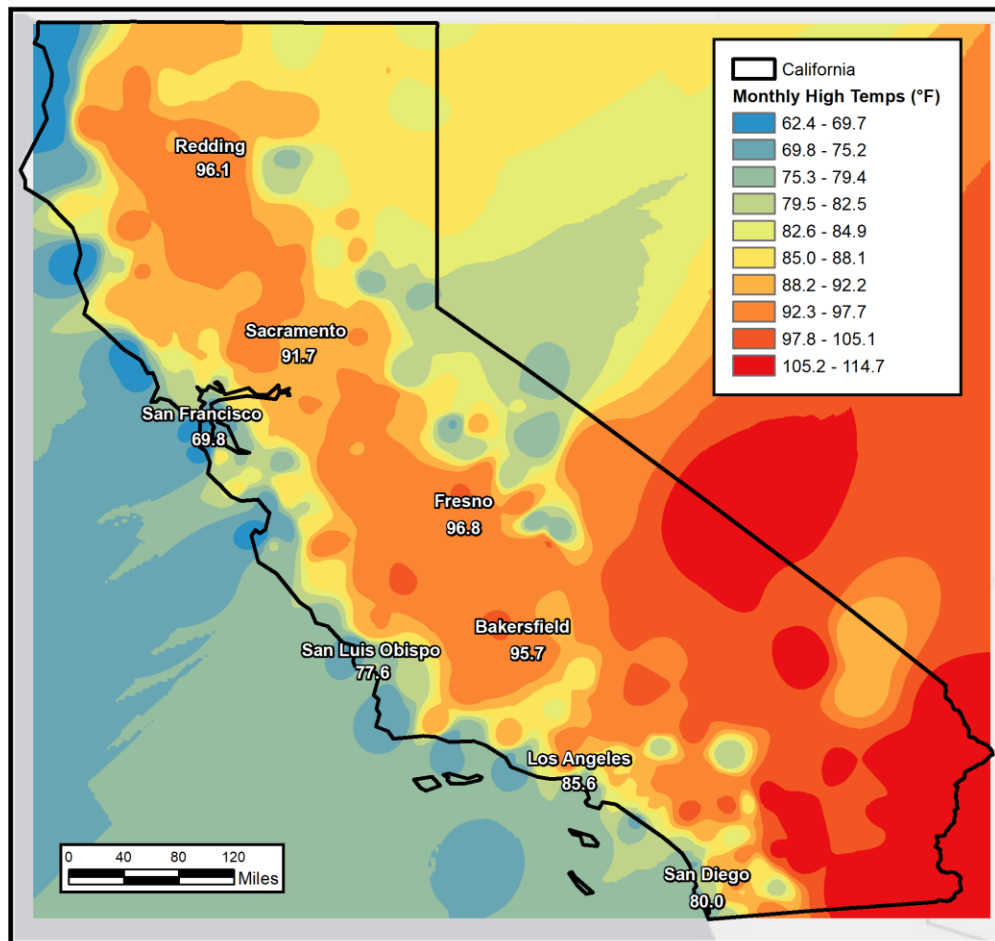
3.1 WARMEST AND COOLEST CALIFORNIA CITIES IN JANUARY

| Warmest Cities | | Coolest Cities | |
|------------------|---------------------|----------------------|---------------------|
| City Name | Avg. High Temp (°F) | City Name | Avg. High Temp (°F) |
| Mecca | 72.1 | Sunnyside-Tahoe City | 39.4 |
| Oasis | 72.0 | Tahoma | 39.5 |
| Indio | 71.9 | Lee Vining | 40.1 |
| La Quinta | 71.8 | Mammoth Lakes | 40.1 |
| Coachella | 71.7 | Chilcoot-Vinton | 40.1 |
| Vista Santa Rosa | 71.7 | Mono City | 40.1 |
| Thermal | 71.5 | June Lake | 40.2 |
| Indio Hills | 71.5 | McGee Creek | 40.4 |
| Indian Wells | 71.3 | Caribou | 40.7 |
| Placentia | 71.0 | Bridgeport | 40.7 |

Table 1. A list of cities with the warmest and the coolest average high temperatures for January. The warmer cities are in Southern California, while the cooler cities are in the northeastern part of the Sierra Nevada mountains.

4 A LOOK AT CALIFORNIA'S SUMMER CLIMATE

Average High Temperatures in August



Sources: ESRI, NOAA, UCLA Geoportal

Map by Jennifer Truong

Figure 2. A map showing monthly average high temperatures for August using IDW interpolation.

In this map, San Francisco has the lowest average high temperature in the month of August (69.8). The cities further south along the coast have higher temperatures; San Luis Obispo is 77.6 degrees, while San Diego is 80 degrees. Los Angeles has the highest max temperature along the coast with an average of 85.6 degrees. The cities that are more inland (Redding, Sacramento, Fresno, and Bakersfield) have average high temperatures ranging in the 90s.

Below are two tables containing the ten warmest and ten coolest cities for the month of August, which do not include the major cities mentioned earlier.

4.1 WARMEST AND COOLEST CALIFORNIA CITIES IN AUGUST

| Warmest Cities | | Coolest Cities | |
|----------------|---------------------|---------------------|---------------------|
| City Name | Avg. High Temp (°F) | City Name | Avg. High Temp (°F) |
| Furnace Creek | 114.7 | McKinleyville | 62.8 |
| Mecca | 107.9 | Westhaven-Moonstone | 62.8 |
| Baker | 107.6 | Fieldbrook | 63.0 |
| Blythe | 107.5 | Arcata | 63.8 |
| Oasis | 107.4 | Myrtletown | 64.3 |
| Palo Verde | 107.0 | Eureka | 64.3 |
| Needles | 106.9 | Pine Hills | 64.5 |
| Cathedral City | 106.6 | Humboldt Hill | 64.5 |
| Indio | 106.6 | Smith River | 64.6 |
| Big River | 106.5 | Bertsch-Oceanview | 64.8 |

Table 2. A list of cities with the warmest and the coolest average high temperatures for August. The warmer cities are in the desert regions of California, while the cooler cities are in the northwestern coast.

5 DISCUSSION

The major cities that are located inland (Redding, Sacramento, Fresno, and Bakersfield) have average high temperatures in the 50s for January and average high temperatures in the 90s for August. In other words, those cities have a large range of high temperatures throughout the year. The cities along the coast (San Francisco, San Luis Obispo, Los Angeles, and San Diego) have a shorter temperature range, even though some of them have higher average temperatures in January.

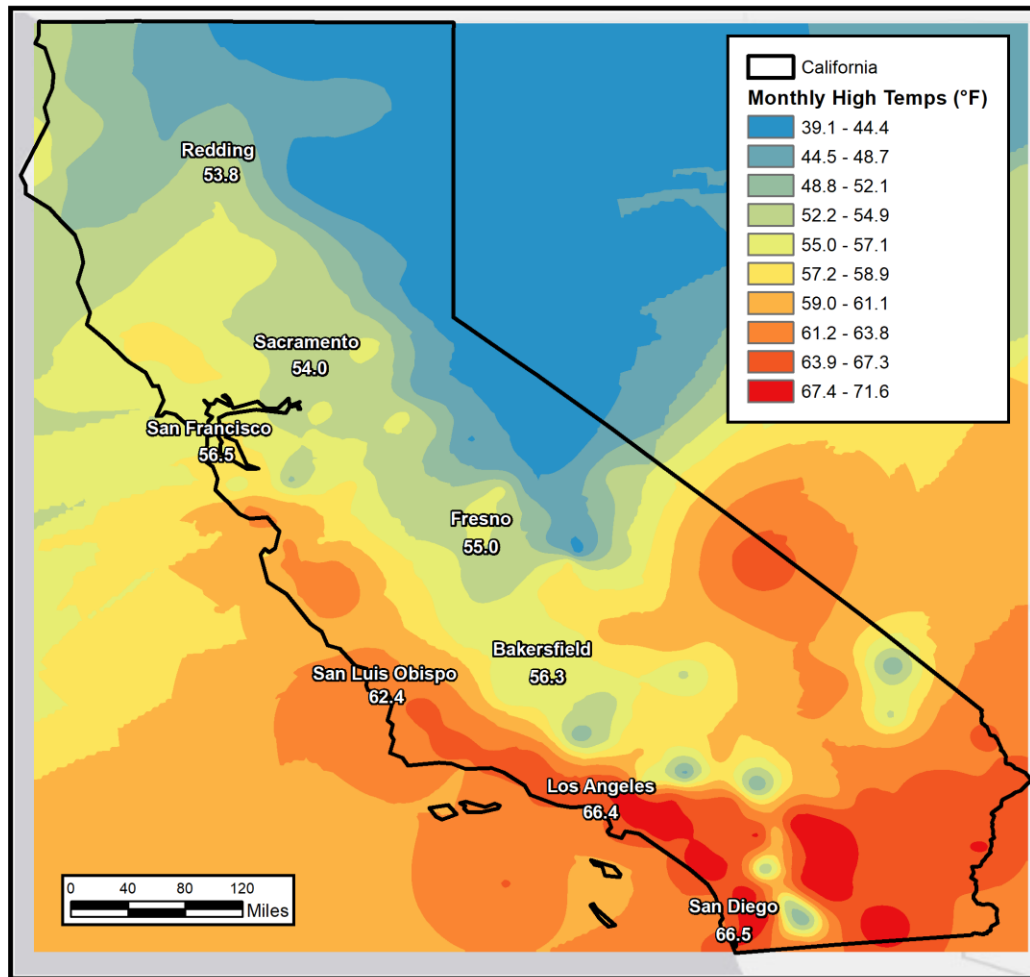
For the month of January, the warmest cities are in Southern California, including parts of Orange and Riverside Counties. The ten coolest cities tend to be in the eastern Sierra Nevada mountains. For the month of August, most of the warmest cities are in the southeastern part of the state, where Joshua Tree National Park and other desert areas are located. The coolest cities are in the northernmost part of the California coast, a region known for the California redwood trees. In general, it seems like the warmer cities are in Southern California while the cooler cities are located in Northern California.

6 CONCLUSION

If you prefer cold weather, feel free to live in the mountainous regions of Northern California. Or if you feel you can handle a hot, dry summer, then a location in Southern California may be right for you. Nevertheless, we hope this report has helped you find the best California city with the best climate for you to live in.

7 TECHNICAL ADDENDUM

Average High Temperatures in January



Sources: ESRI, NOAA, UCLA Geoportal

Map by Jennifer Truong

Figure 3. A map showing the monthly average high temperatures in January using EBK interpolation.

Another method used for interpolation analysis is Empirical Bayesian Kriging (EBK). Unlike the IDW method, which mostly takes distance into account, the EBK method considers geostatistics in its calculations, providing room for accuracy. Visually, there are only slight differences with this map and the IDW map for January high temperatures in terms of the gradient shown on the map and the values for some of the cities.

However, it did change the list for the ten warmest and coolest cities significantly. The range of temperatures shortened slightly, so that the highs were between 40 and 72 degrees, in comparison to 39 and 73 degrees for the IDW method. Some cities that were not included in the IDW list have now appeared, whereas others disappeared off the list.

7.1 WARMEST AND COOLEST CALIFORNIA CITIES IN JANUARY

| Warmest Cities | | Coolest Cities | |
|------------------|---------------------|----------------------|---------------------|
| City Name | Avg. High Temp (°F) | City Name | Avg. High Temp (°F) |
| Thermal | 71.5 | Mono City | 40.1 |
| Vista Santa Rosa | 71.4 | Lee Vining | 40.3 |
| Coachella | 71.3 | Lake City | 40.5 |
| Mecca | 71.3 | June Lake | 40.7 |
| Indio | 71.1 | Bridgeport | 40.8 |
| Oasis | 70.9 | Westwood | 40.8 |
| La Quinta | 70.8 | Sunnyside-Tahoe City | 41.0 |
| Placentia | 70.4 | Mammoth Lakes | 41.0 |
| Villa Park | 70.3 | Cedarville | 41.1 |
| Orange | 70.3 | Tahoe Vista | 41.1 |

Table 3. A list of cities with the warmest and the coolest average high temperatures for January, generated after EBK interpolation. The warmer cities are in Southern California, while the cooler cities are in the northeastern part of the Sierra Nevada mountains.

8 WORKS CITED

8.1 MAP SOURCES:

National Centers for Environmental Information, and NCEI. "Climate Data Online." *Climate Data Online (CDO)*, National Oceanic and Atmospheric Administration, www.ncdc.noaa.gov/cdo-web/.

"UCLA Geoportal." *UCLA Geoportal*, UCLA Department of Geography, gis.ucla.edu/geodata/.