

INFO 474: Final Project Design Document

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Supported User Tasks

1. Hikers and tourists who are traveling around the US can use this visualization to help decide what kinds of clothes/layers to pack by viewing the daily average temperatures of the city they will go to and the few days during which they would be visiting.
2. Climate Researchers can compare the different years in which the maximum and minimum temperatures occurred for each city on particular days or months by hovering over and viewing the ‘Year Recorded’ for each min and max recorded temperature. This information can help the user identify extreme weather patterns and help advocate for better climate policy.
3. Farmers can use this visualization to help determine how much they need to irrigate crops without wasting water. They can perform this task by selecting daily average temperatures for the city they live in/near, and hovering over parts of the year to view the precipitation in millimeters in the pop-up to use as an estimate for the same time this year.
4. Meteorologists can determine temperature anomalies by comparing the lowest and highest recorded temperatures and the year of occurrence with the daily average temperatures for each city.
5. By selecting daily average temperatures for various cities, this visualization helps high school seniors make informed decisions about which colleges to tour or accept. Users can filter and compare weather data different in cities that best align with their personal weather preferences, enabling them to select colleges that offer an ideal climate for their studies and lifestyle.
6. New residents of a city can view the daily average temperatures of their selected city to get a better well rounded understanding of the yearly temperatures. They would be able to easily get an overview of the data and spot the average minimum and maximum temperatures.

Design Overview and Description:

My radial bar diagram design provides a visually engaging way for users to explore temperature trends over time in the United States. The subtitle below the title has the words “Explore (user selected temperature attribute) in (user selected city)” for freedom of data exploration according to personal interests.

By representing each day of the year as a bar, I’ve allowed users to easily see how temperatures change over the course of a year. The bars’ heights are according to temperature (Fahrenheit) where the inner radius of the circle is 0°F, and the circle arcs within the diagram have labeled ticks of temperature intervals from -20 to 130°F. Additionally, the use of an intuitive color scale from blue to red as temperatures increase allows users to quickly see the temperature range for each day.

The analytical questions that I intended to answer with this design include: How do average daily, minimum, and maximum temperature patterns vary across different cities in the United States? Which year had the lowest and highest temperature occurrence on this day for different cities? How do the highest and lowest recorded temperatures on this day compare to the most recent daily average temperature on that same day of the year? How much precipitation occurred during this day for each city? By providing dropdowns for users to select a specific city and temperature attribute, I have enabled viewers to explore and compare temperature data in a way that is relevant and meaningful to them.

The communicative objectives of the design include educating viewers about temperature trends in the United States, as well as allowing them to make informed comparisons and decisions based on temperature data. I specifically added the option of the minimum and maximum recorded temperatures to emphasize the importance of learning about extreme weather patterns compared to daily average temperatures for every city data available since climate change is an extremely pressing and urgent issue that needs to be addressed more. In the future, I would like to have the temperature attributes from all years leading up to 2023 (not just 2014-2015) so that viewers can learn how temperature anomalies and extreme weather patterns have worsened over time due to climate change.

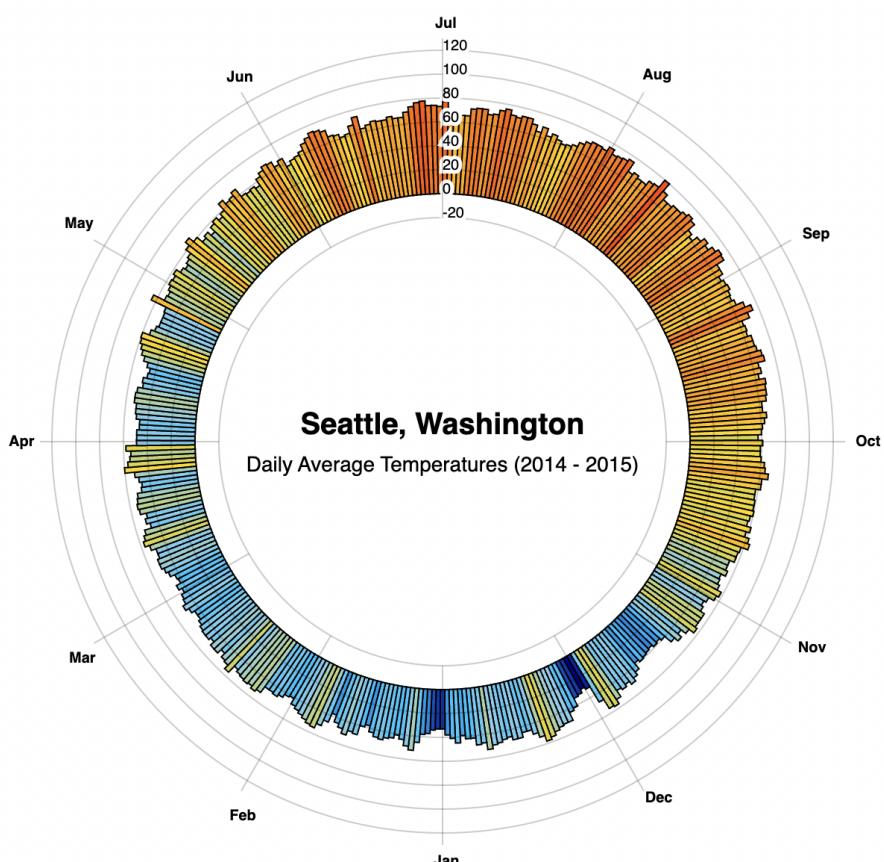
In terms of usability, the dropdowns, the tooltip on hover of each bar to display exact temperature and date information, and changing text in the center of the diagram according to city and temperature selected all allow for a clean and intuitive interface for users of any skill level. These were intentionally added to ease the user experience and allow for a seamless data exploration process.

By providing a user-friendly interface for exploring temperature data, I’ve enabled users to engage with the information and draw their own conclusions about weather patterns in different regions of the United States. Overall, the design prioritizes user-centeredness and usability to provide an informative and accessible data visualization tool.

Screenshots:

United States Weather Trends

Explore Daily Average Temperatures in Seattle, Washington



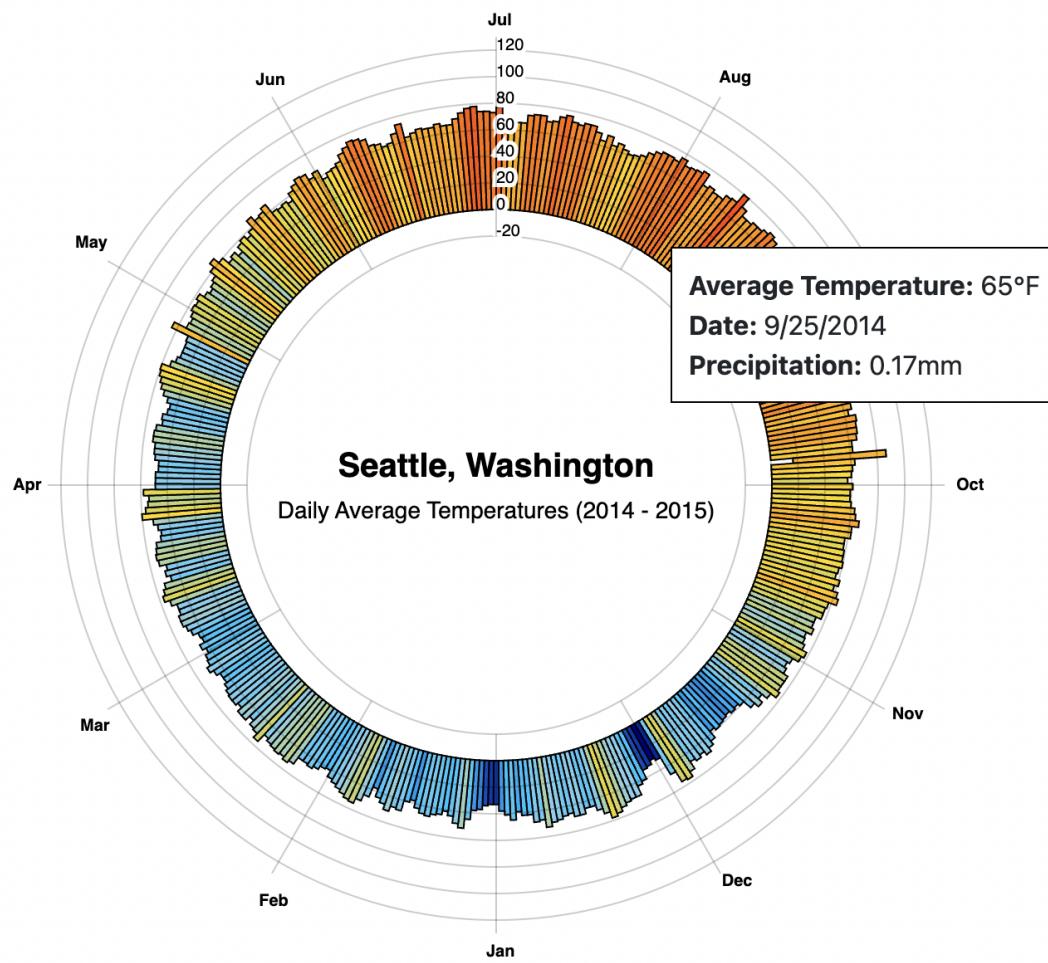
United States Weather Trends

Explore

Daily Average Temperatures

in

Seattle, Washington



United States Weather Trends

Explore

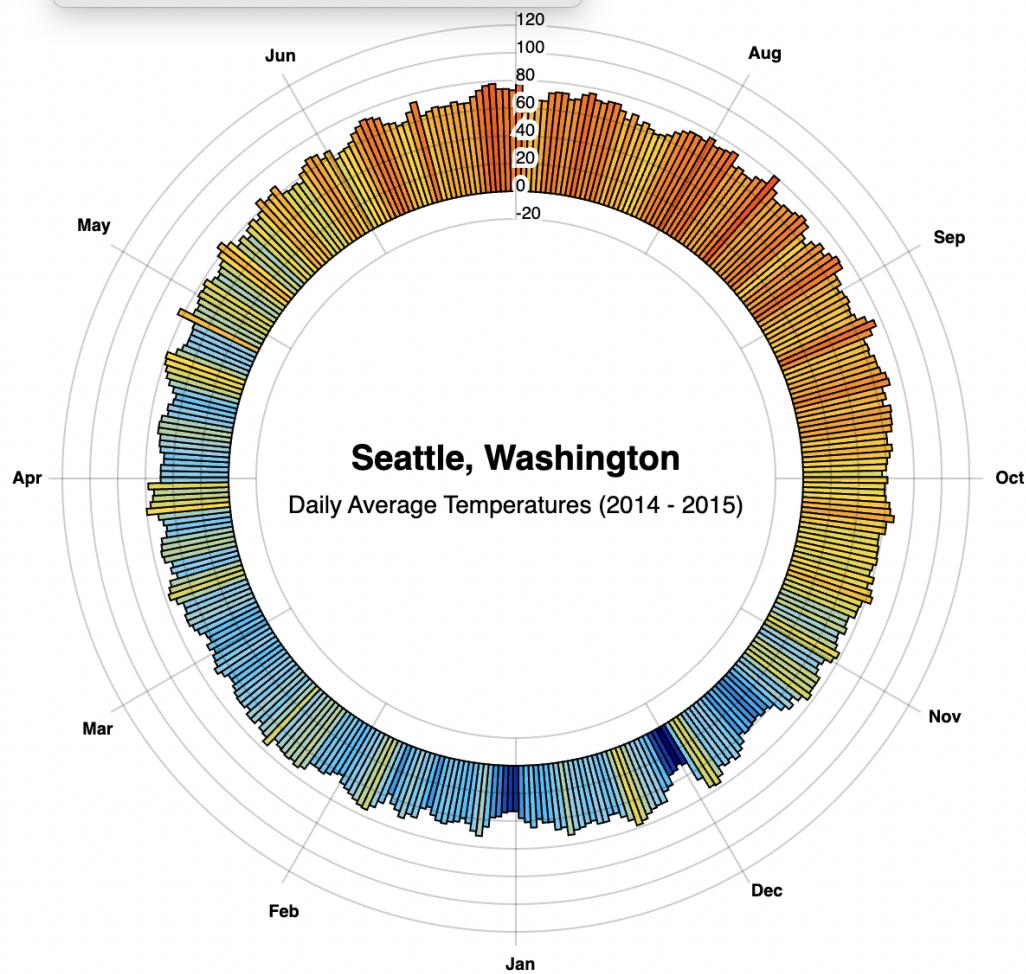
✓ Daily Average Temperatures

Record Minimum Temperatures

Record Maximum Temperatures

in

Seattle, Washington



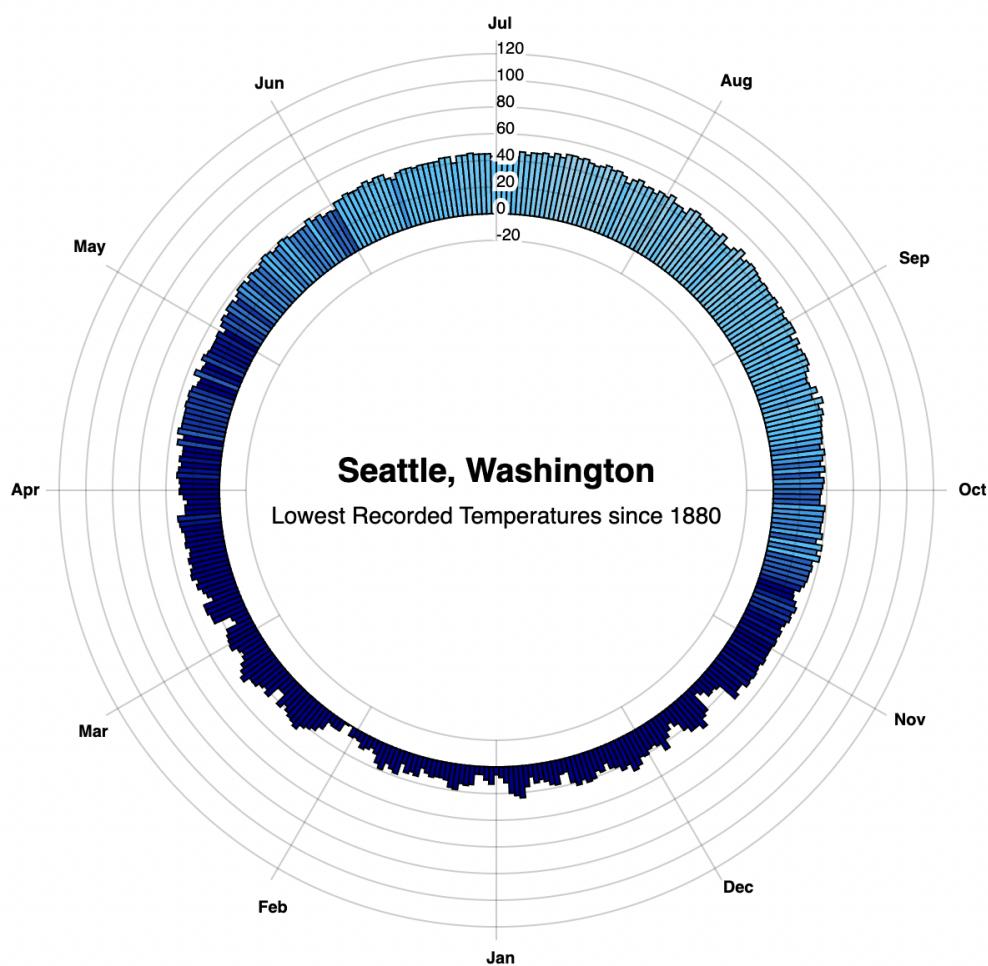
United States Weather Trends

Explore

Record Minimum Temperatures

in

Seattle, Washington



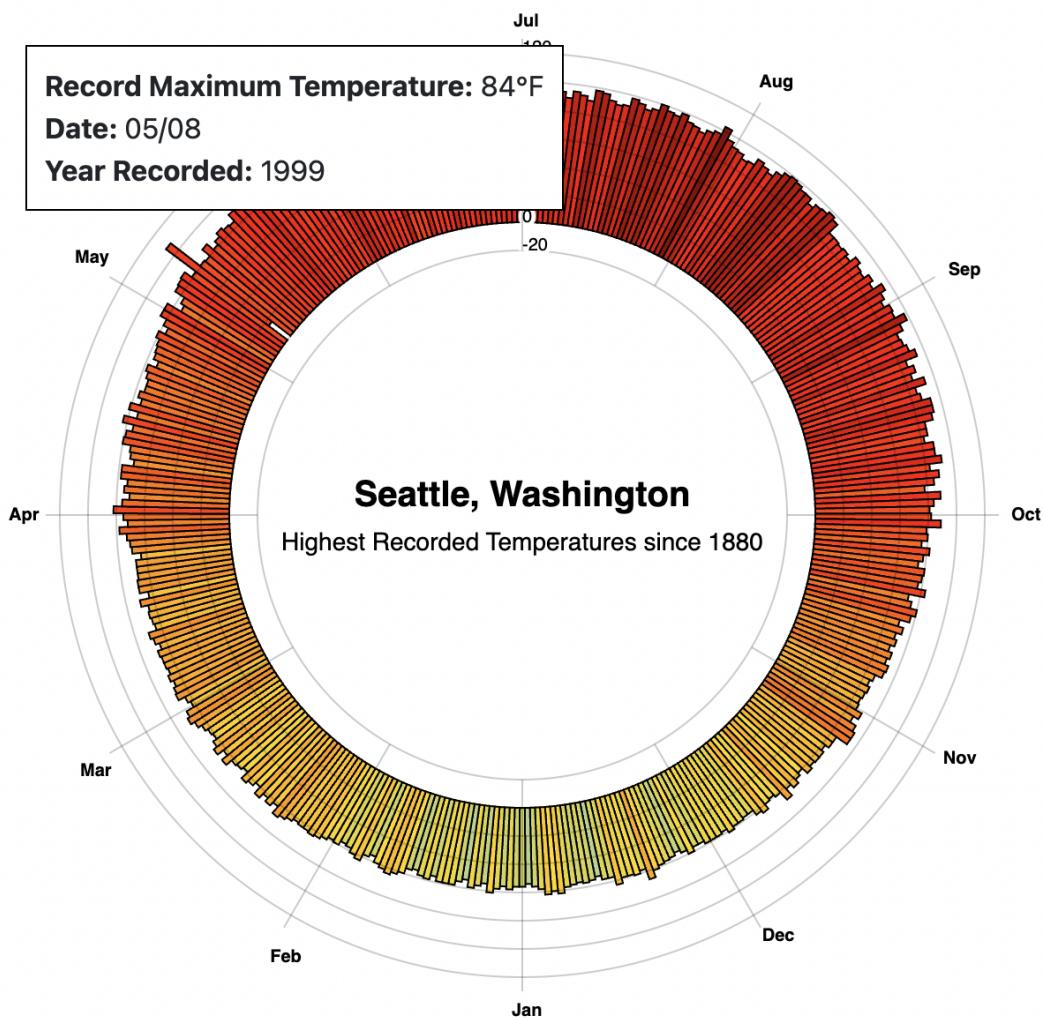
United States Weather Trends

Explore

Record Maximum Temperatures

in

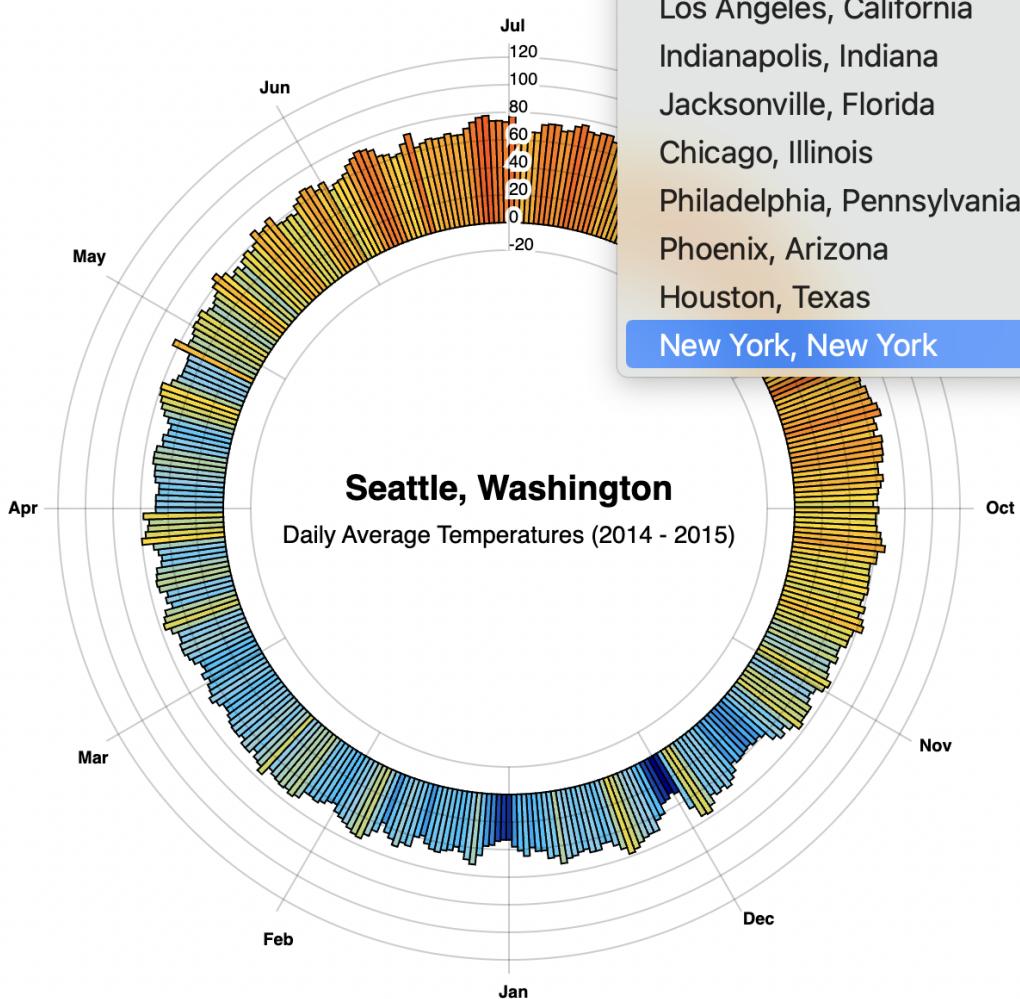
Seattle, Washington



United States Weather Trends

Explore

Daily Average Temperatures



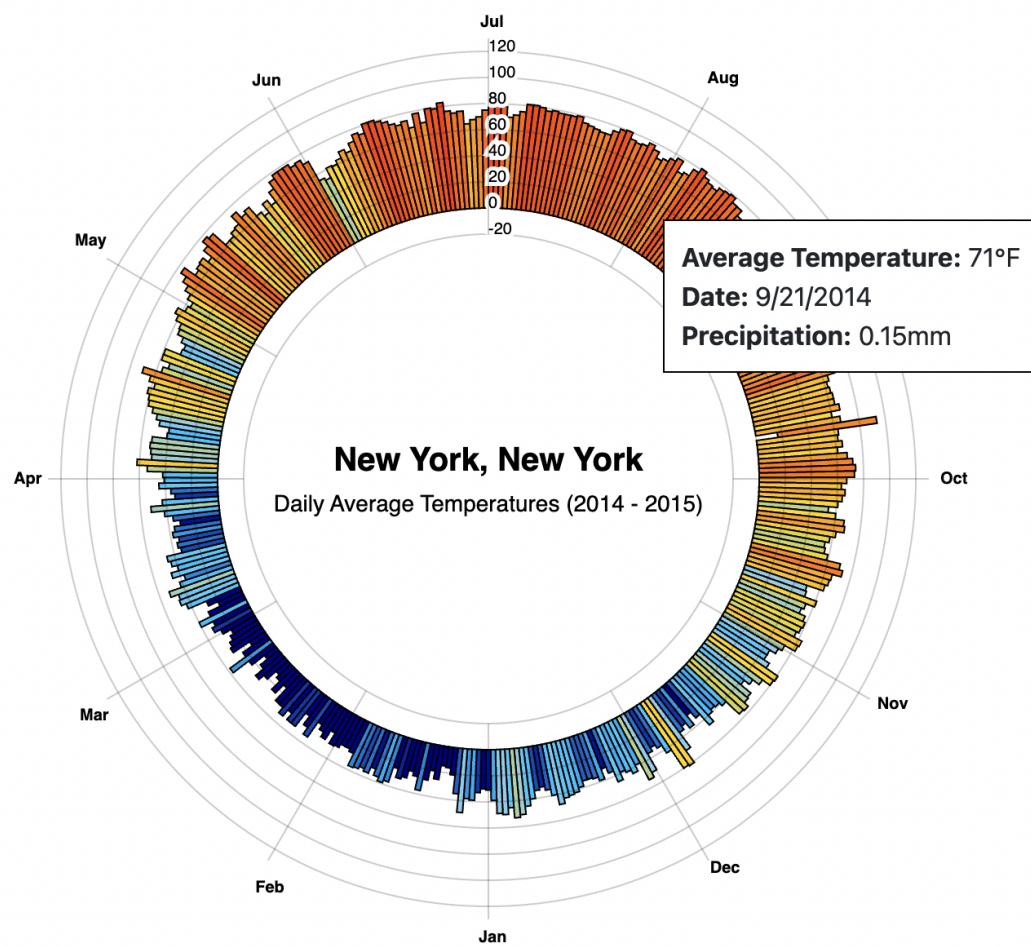
United States Weather Trends

Explore

Daily Average Temperatures

in

New York, New York



United States Weather Trends

Explore Record Minimum Temperatures in New York, New York

