

The goal of this problem set is to get you better acquainted with datasets pertaining to climate. Some of these datasets will have graphical displays, and others will be tabular. Some of the websites that will be helpful in completing this problem set are listed on the class webpage under Homework --> Problem Set 3.

A. Most of the information for this section can be accessed from websites #2 and #3

1. What are the climatological normal June daily mean temperatures at San Francisco (airport) and Stockton, CA? (website #3). What accounts for the difference in these temperatures? (Stockton and San Francisco are only 130 km apart!) Do the same exercise for the climatological normal December daily mean temperatures. What accounts for the differences in these temperatures? Why does Stockton have a more extreme temperature range than San Francisco? Now look at a map of California's annual precipitation (website #2). Does this change your opinion in any way?
2. What are the average annual snowfall totals for Barrow, AK and Fairbanks, AK? How would you explain these differences? Look at a map of Alaska's average annual precipitation (website #2). What is the reason for the large gradient in precipitation between southern and northern Alaska? Also, why are the precipitation values larger for southern Alaska than for California? Caution: Alaska map shows precipitation in mm.

B. Use website #4

3. Construct maps of the winter (DJF) and summer (JJA) distribution of temperatures over the continental US (CONUS). Set the following options:

(Be sure to save your maps and include them in your problem set write-up!)

Variable: Temperature
Type of Plot: Mean
Time period: 1895-2017
Summer (JJA): beginning (ending) month June (August)
Winter (DJF): beginning (ending) month December (February)
Type of plot: Choose mean temperature JJA: Contour interval 14.0 to 28.0 C by 1.0 C
Type of plot: Choose mean temperature DJF: Contour interval -14.0 to 14.0 C by 1.0 C
Scale plot size to 200%
Choose white for central values/anomalies: choose yes

Please answer the following questions:

- a. During summer, the warmest regions are found in parts of the Southwest and Texas. Explain.
- b. During summer, why is there relatively large temperature variability across Idaho, Montana and Wyoming?
- c. During winter, why are the lowest mean temperatures over North Dakota and Minnesota instead of farther west where the elevations are higher?
- d. During winter, why is there a relatively strong east-west temperature gradient across Texas?

4. Construct maps of the winter (DJF) and summer (JJA) distribution of precipitation over the continental US (CONUS). Set the following options:

(Be sure to save your maps and include them in your problem set write-up!)

Variable: Precipitation
Type of Plot: Mean
Time period: 1895-2017
Summer (JJA): beginning (ending) month June (August)
Winter (DJF): beginning (ending) month (December (February)
Type of plot: Choose mean precipitation JJA: Contour interval 0.0 to 50 cm by 2.0 cm
Type of plot: Choose mean precipitation DJF: Contour interval 0.0 to 40.0 cm via 2.0 cm
Scale plot size to 200%
Choose white for central values/anomalies: choose yes

Please answer the following questions:

- a. Which regions have a winter or summer precipitation maximum? Explain.
- b. What likely accounts for precipitation variability within a given region (e.g., the Pacific Northwest in winter)?
- c. What weather phenomena likely contribute to the summer (winter) rainy seasons in Texas, Florida and Kansas (California, lower Mississippi and Tennessee Valleys, and New England)?