Name: Date:

Weather to Climate Investigation: Maximum Temperature

Guiding Questions:

• What are the historical and current weather patterns or events for a location in the United States?

• What are the long-term weather (i.e. climate) patterns for this location?

Definitions:

• ***Weather*** *is the mix of events (precipitation, humidity, temperature, etc.) that happen over a short period of time (minutes to months) in a specific location.*

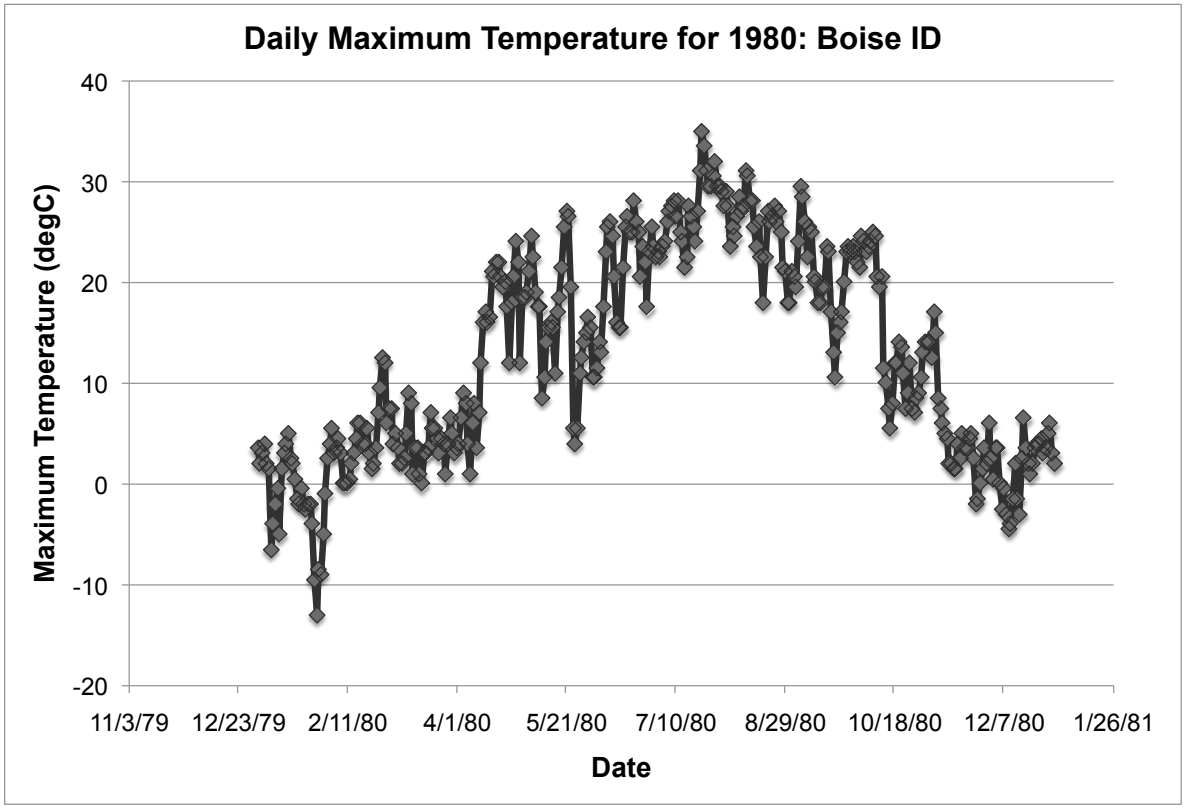
• ***Climate*** *is the long-term pattern of weather in a particular area. This is often measured as the average weather over a period of time.*

• ***Maximum Temperature*** *is the highest temperature recorded on a particular day.*

Conduct the Investigation:

Location	Latitude	Longitude
Boise, ID	*44.14*	*-115.63*

1) The graph below shows daily maximum temperature data for the year 1980. You will use the graph to analyze and interpret data and to prepare you for a climate investigation.



1) In Boise, in 1980, which month had the highest maximum daily temperature? How hot was it? Make an estimate of the highest temperature in 1980.

August had the hottest temperature in 1980. I would estimate that the temperature got up to 35°C.

2) Which month had the lowest maximum daily temperature? How cold was it? Make an estimate of the lowest temperature in 1980.

The end of January had the coldest temperature in 1980. I would estimate that the lowest temperature was -13°C.

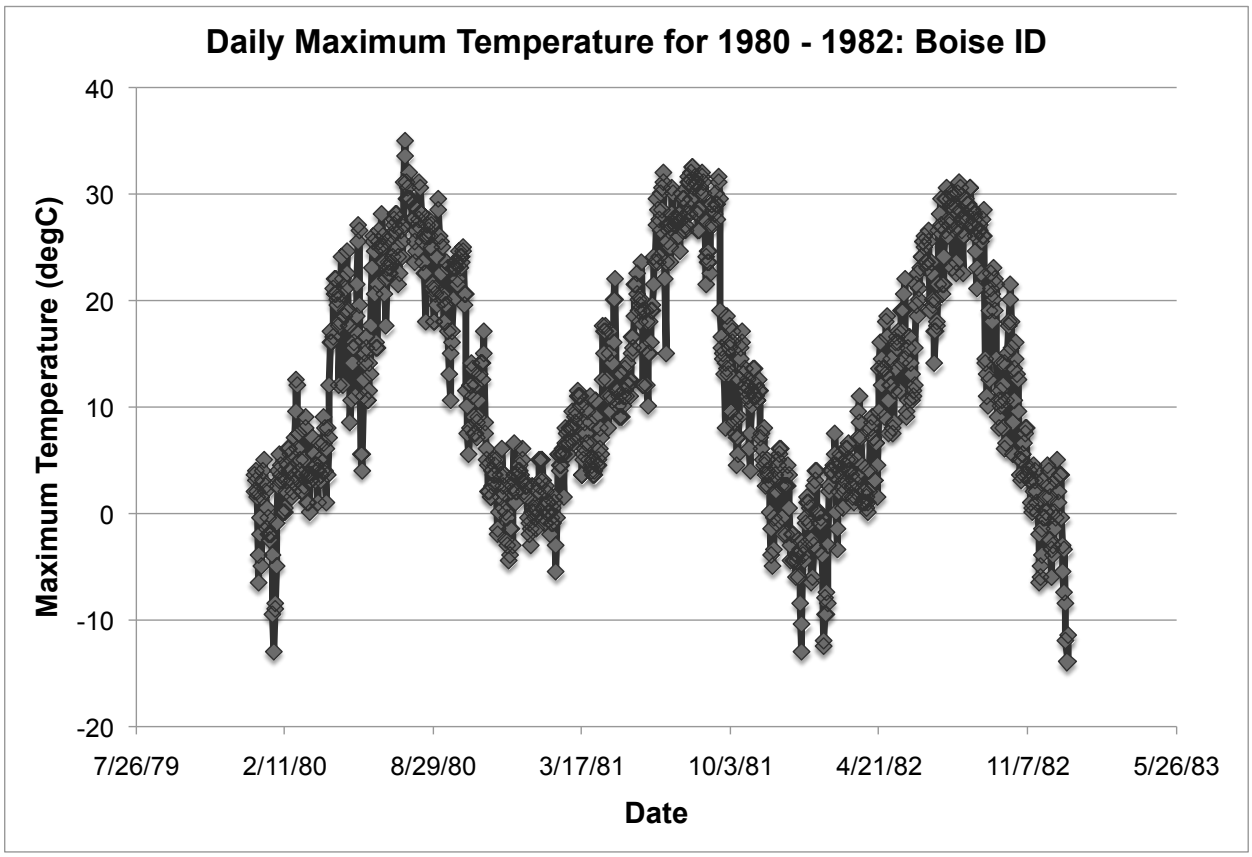
3) How would you describe the overall temperature pattern for 1980?

The overall pattern is curve that increases and then decreases. The temperature starts around 4°C in January, dips to its lowest point in late January/early February, rises steadily to the highest point in August, and then drops back down to around 0°C in December.

4) Make a prediction: do you think the overall temperature pattern is similar or different from year to year? (i.e. will the temperature in 1981 look the same as the temperature in 1980?).

I think that each year, the temperature will follow the same pattern, but the temperature values for the highest point and lowest point might be different.

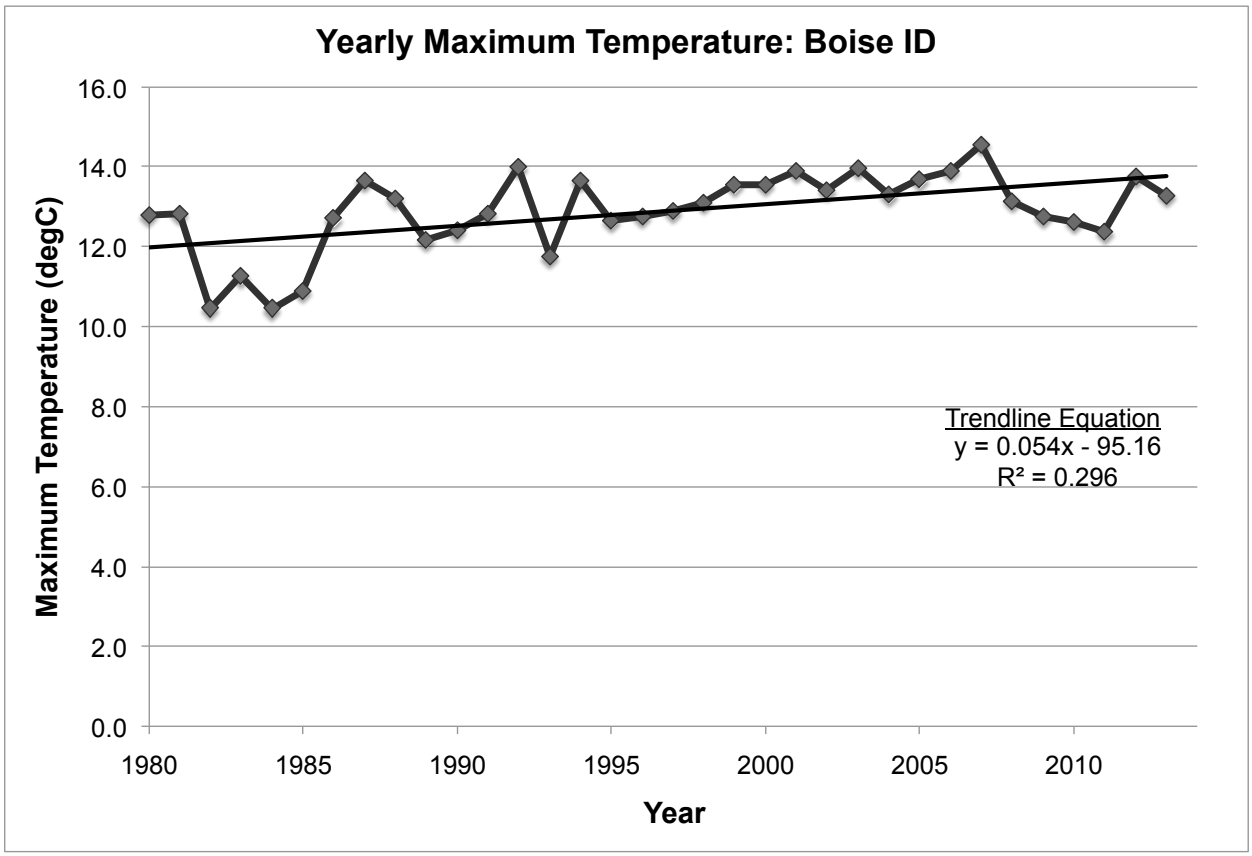
5) Now look at a graph of 3 years of maximum temperature data.



6) Do the data support your prediction? Explain using data from the graph.

The data did support my prediction. Each year the temperature follows the same curve. However, the highs and lows each year are different. The high in 1980 is around 35°C, but in 1982 it is slightly lower, 31°C. The lows in 1982 were the lowest, around -15°C.

7) Will these weather patterns remain the same over time? One way to find out is to display the yearly averages (the daily weather data averaged over each year), which illustrates how the climate in an area may be changing over time. By averaging the daily weather data, an entire year's worth of daily weather data is summarized with a single number. On the next page is a graph of the yearly average temperature from 1980 to 2013.



8) What is the range of yearly average temperature from 1980 to 2013?

The average temperature ranges from about 11°C to 14.5°C.

9) Using the trendline to help you, do you observe a trend in temperature over time? Is the temperature increasing, decreasing or remaining the same? Support your response with specific evidence displayed in the graph. (*A **trendline** is the line showing the general direction of the data, its equation is displayed on the graph*).

The temperature trend is increasing. I can tell because the slope of the line is positive, with a value of 0.054 (R^2 = .296).

10) Make a prediction: Do you expect this trend to continue over time? How might the climate change in this area in 100 years? Provide some evidence that supports your prediction.

I think that the trend will continue to increase over time. I expect that the temperature will begin increasing even more (the slope will get steeper) because of increasing greenhouse gas levels in the atmosphere.

11) Ask a question: What questions do you have about weather and/or climate following an initial exploration of one site?

Will the temperature increase more in the future with climate change?