

What Factors Affect the Climate of an Imaginary Continent?

Continent X

Climate involves an *average* of weather conditions for a large geographical region over a long period of time. It is described by averages, ranges, and daily and seasonal variations for factors such as rainfall, winds, and temperature. The great number of possible combinations of factors for different parts of the world makes the classification of climates very complicated.

Climate can be described in terms of average temperature (*hot, temperate, or cold*—from hottest to

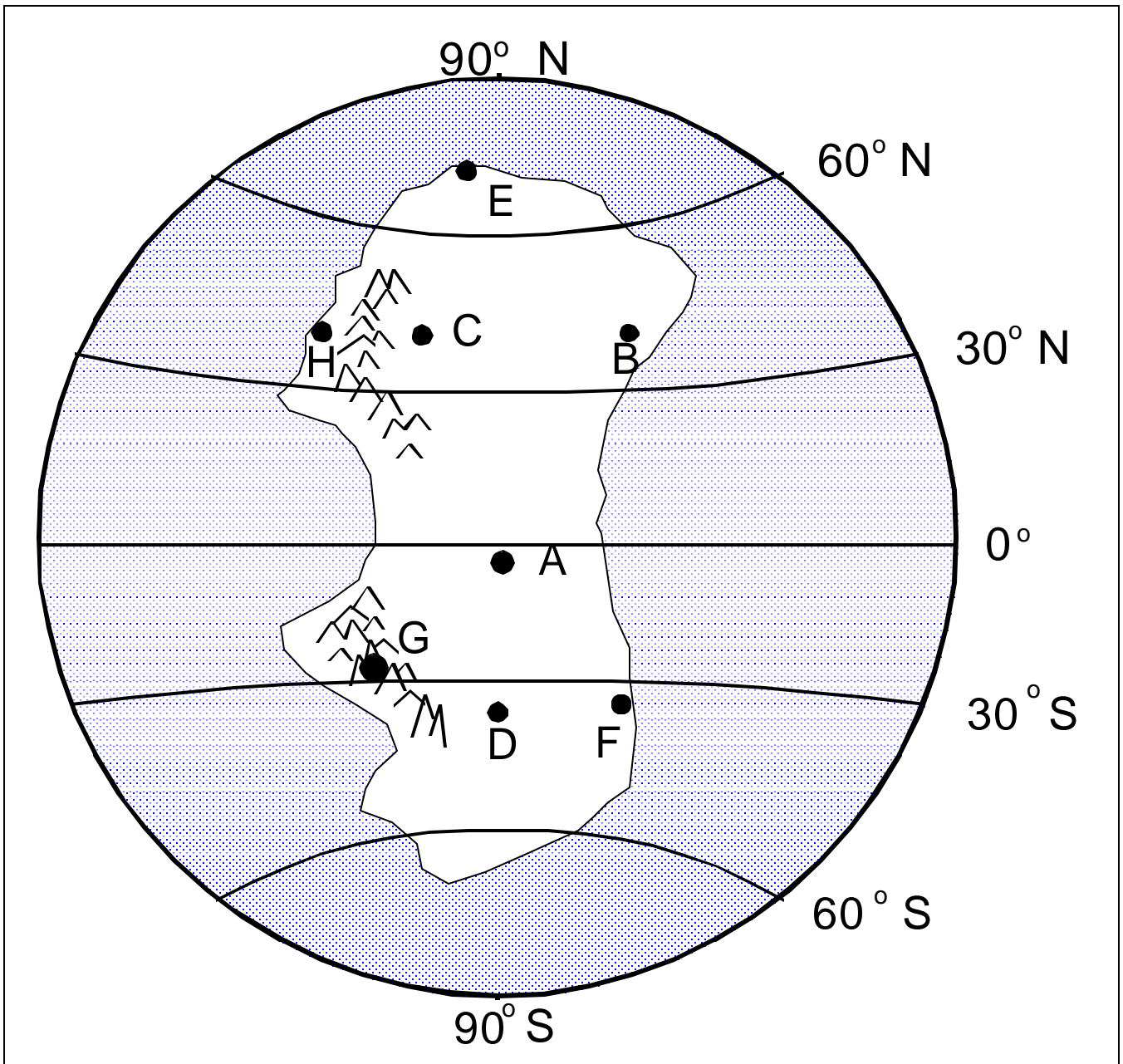


Figure 1: Continent “X.” Eight cities are labeled A through H. All cities lie at sea level, except for City G, which is high in a mountain range.

coldest), and humidity (*humid, sub-humid, semi-arid, or arid*—from most humid to most dry). In this investigation you will analyze a model, "Continent X," by studying the basic and modifying factors that contribute to its climates.

Procedure

Examine the geographic locations of cities A through H. Some of the factors you will need to consider include each one's:

- latitude (since that affects how much total insolation they receive);
- proximity to an ocean (since coastal cities tend to have a more *moderate* climate than those that are inland);
- elevation above sea level (because higher altitude cities will experience overall cooler temperatures);
- planetary wind belt (since where weather systems come *from* affects local climate);
- position relative to mountains (since those cities of the leeward side of mountain ranges will have drier/warmer conditions than those on the windward side).

First, A Few Review Questions... (refer to your class notes, if necessary):

1. As latitude increases, temperature _____.

2. As altitude increases, temperature _____.

3. Locations that are near large bodies of water tend to have _____ summers and _____ winters than locations that are inland.

4. Describe what happens to air as it rises (as it may over a mountain range): _____

5. Describe what happens to air as it sinks (as it may on the leeward side of a mountain range):

6. The following latitudes are places of rising air, and low pressure: _____

7. The following latitudes are places of sinking air, and high pressure: _____

8. Low pressure is associated with _____ weather conditions, while high pressure is associated with _____ weather conditions.

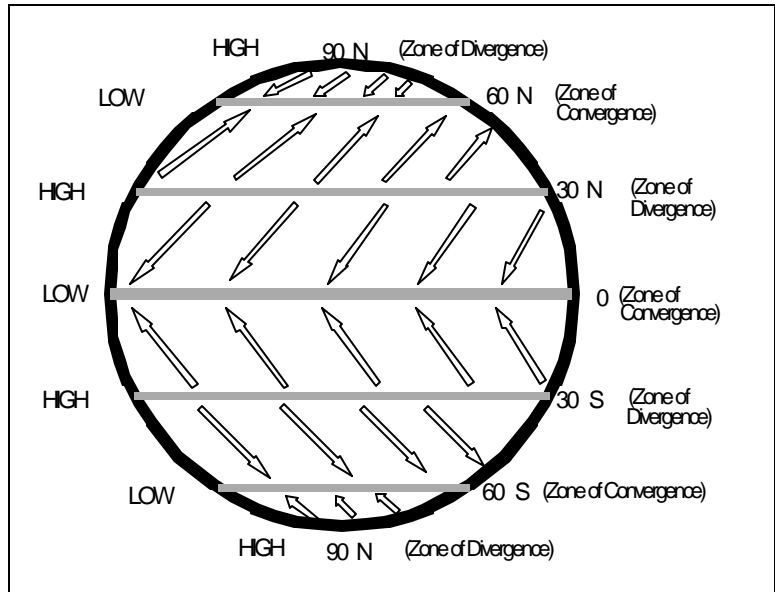
Procedures and Questions

- Using the map in Figure 1, analyze the locations to develop hypotheses to address the following:

9. *Temperature range* is the difference between the highest temperatures in the summer, and lowest temperatures in the winter. Explain the difference in temperature ranges expected at location D and location F.

- To the right is a map showing the planetary winds, and high and low air pressure belts. Copy this diagram onto **Figure 1**. Label the HIGHS and LOWS, and draw the arrows showing planetary winds on Continent X.

10. Classify the climates of the seven locations labeled A, B, C, D, E, F, G and H in terms of general temperature and humidity characteristics. Use words such as "hot," "cold," or "temperate" to describe general temperature, and "arid," "semi-arid," "sub-humid" and "humid" to describe moisture characteristics.



Temperature/Moisture

- A _____
- B _____
- C _____
- D _____
- E _____
- F _____
- G _____
- H _____