

## Climate Of A Location

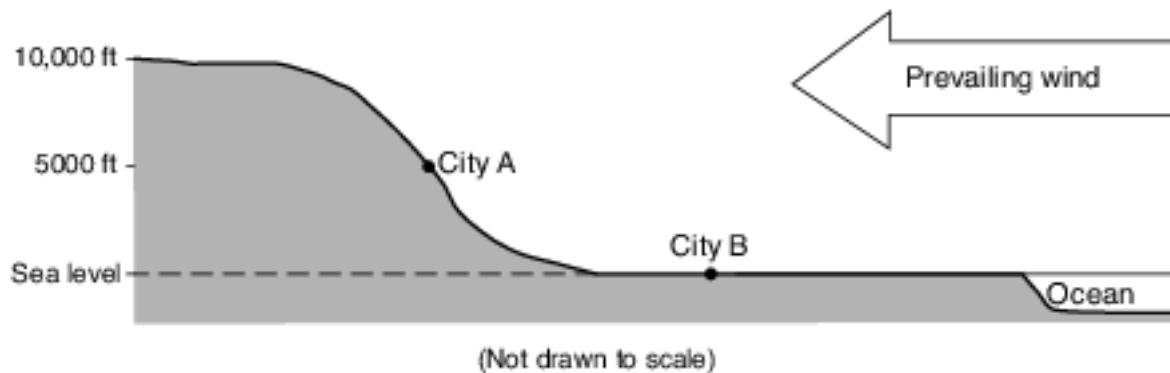
1 Which surface ocean current cools the climate of the western coastline of South America?

- (1) Brazil Current
- (2) Peru Current
- (3) Falkland Current
- (4) California Current

2 The Gulf Stream and North Atlantic Current modify the climate of northwestern Europe by making the climate

- (1) warmer and drier
- (2) warmer and more humid
- (3) cooler and drier
- (4) cooler and more humid

3 The cross section below shows two cities, A and B, at different elevations.



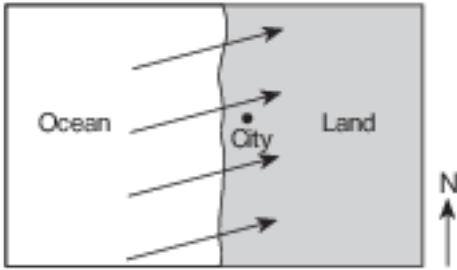
Compared to the yearly temperature and precipitation at city B, city A most likely has

- (1) lower temperatures and less precipitation
- (2) lower temperatures and more precipitation
- (3) higher temperatures and less precipitation
- (4) higher temperatures and more precipitation

4 A city located on the coast of North America has warmer winters and cooler summers than a city at the same elevation and latitude located near the center of North America. Which statement best explains the difference between the climates of the two cities?

- (1) Ocean surfaces change temperature more slowly than land surfaces.
- (2) Warm, moist air rises when it meets cool, dry air.
- (3) Wind speeds are usually greater over land than over ocean water.
- (4) Water has a lower specific heat than land.

- 5 The arrows on the map below show the prevailing winds at a midlatitude coastal city.



This city most likely has a climate that is

- (1) arid, with a small difference between the highest and lowest yearly temperatures
- (2) arid, with a large difference between the highest and lowest yearly temperatures
- (3) humid, with a small difference between the highest and lowest yearly temperatures
- (4) humid, with a large difference between the highest and lowest yearly temperatures

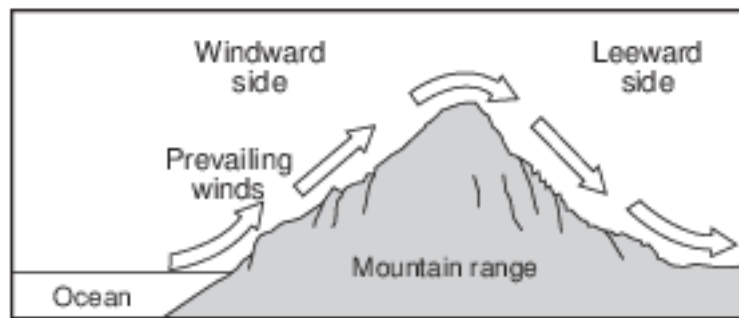
- 6 The photograph below shows Mt. Kilimanjaro, a volcano in Africa, located near the equator.



Which climate factor is responsible for the snow seen on Mt. Kilimanjaro?

- (1) high latitude
- (2) high elevation
- (3) nearness to a cold ocean current
- (4) nearness to a high-pressure weather center

- 7 The cross section below represents a prevailing wind flow that causes different climates on the windward and leeward sides of a mountain range.



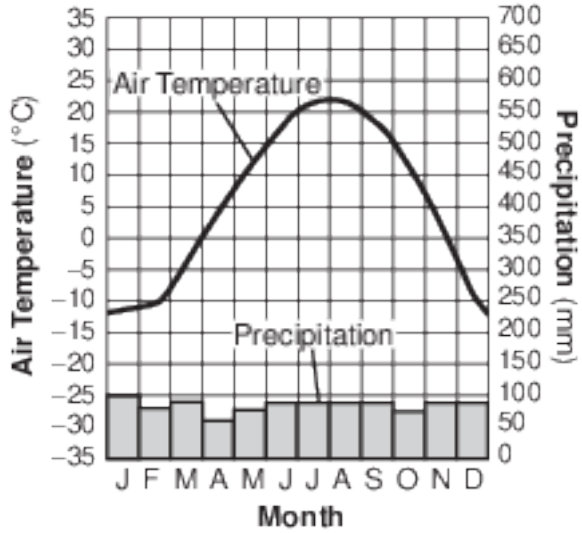
Compared to the temperature and moisture of the air rising on the windward side, the temperature and moisture of the air descending at the same altitude on the leeward side will be

- |                           |                           |
|---------------------------|---------------------------|
| (1) warmer and drier      | (3) cooler and drier      |
| (2) warmer and more moist | (4) cooler and more moist |

- 8 Riverhead, New York, has a smaller average daily temperature range than Elmira, New York, because Riverhead is located

- |                                |                           |
|--------------------------------|---------------------------|
| (1) near a large body of water | (3) at a higher elevation |
| (2) at a lower latitude        | (4) near a large city     |

9 The graph below shows the yearly air temperature and precipitation of a location on Earth.

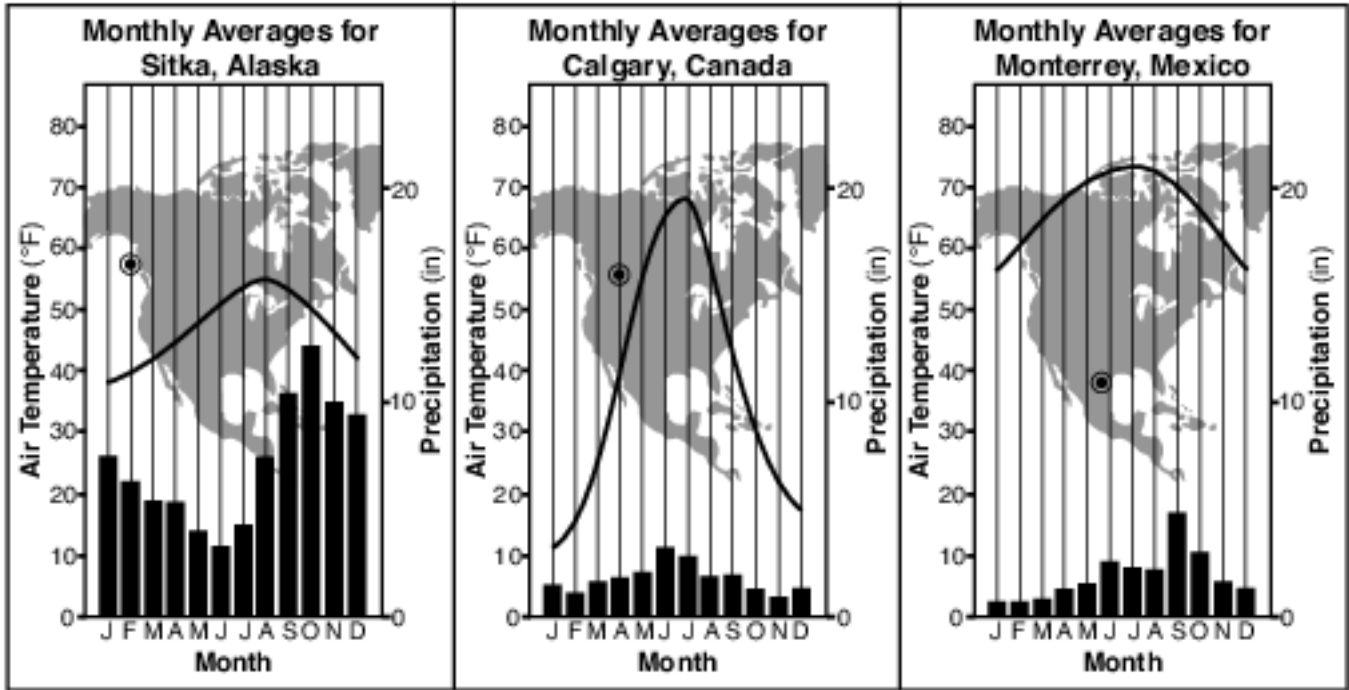


This location would be most likely at a latitude of

- (1) 0°
- (2) 35° S
- (3) 50° N
- (4) 90° N

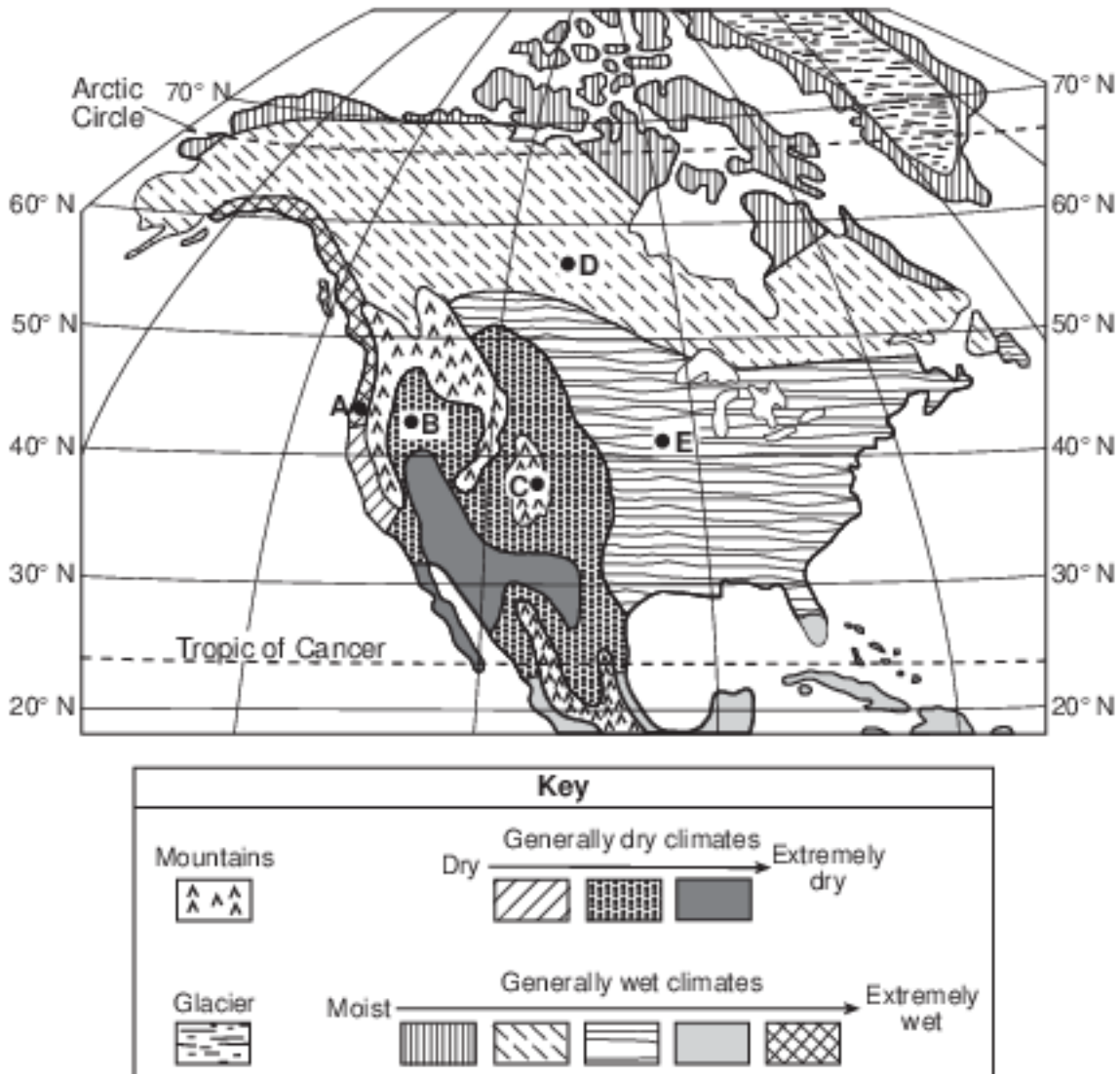
Base your answers to questions 10 on the graphs below and on your knowledge of Earth science. The climate graphs represent data for three different locations in North America. Line graphs show the average monthly air temperatures in degrees Fahrenheit (°F). Bar graphs show the average monthly precipitation in inches (in). A circled dot (●) indicates each location on the maps.

**Climate Graphs**



10 State one reason why the annual temperature range of Calgary, Canada, is greater than the annual temperature range in Sitka, Alaska. [1]

Base your answers to questions 11 on the generalized climatic moisture map of North America below and on your knowledge of Earth science. Areas are classified as generally dry or generally wet, and then ranked by relative moisture conditions. Glacial and mountain climate areas are also shown on the map. Points A, B, C, D, and E indicate locations on Earth's surface.



11 Explain why the climate at location A is more moist than the climate at location B. [1]

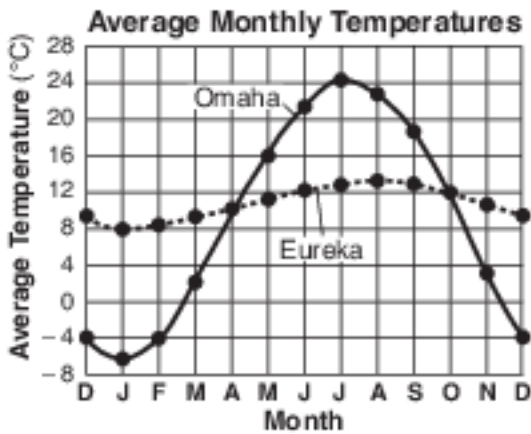
Base your answers to questions 12 on the map in image provided and on your knowledge of Earth science. The map shows an imaginary continent on a planet that has climate conditions similar to Earth. The continent is surrounded by oceans. Points A through D represent locations on the continent.

12 Identify the primary factor that causes location C to have a colder climate than location D. [1]

Base your answers to questions 13 on the topographic map of Hawaii in image provided and on your knowledge of Earth science. Points A and B represent surface locations on the island. Land elevations and Pacific Ocean depths are shown in meters.

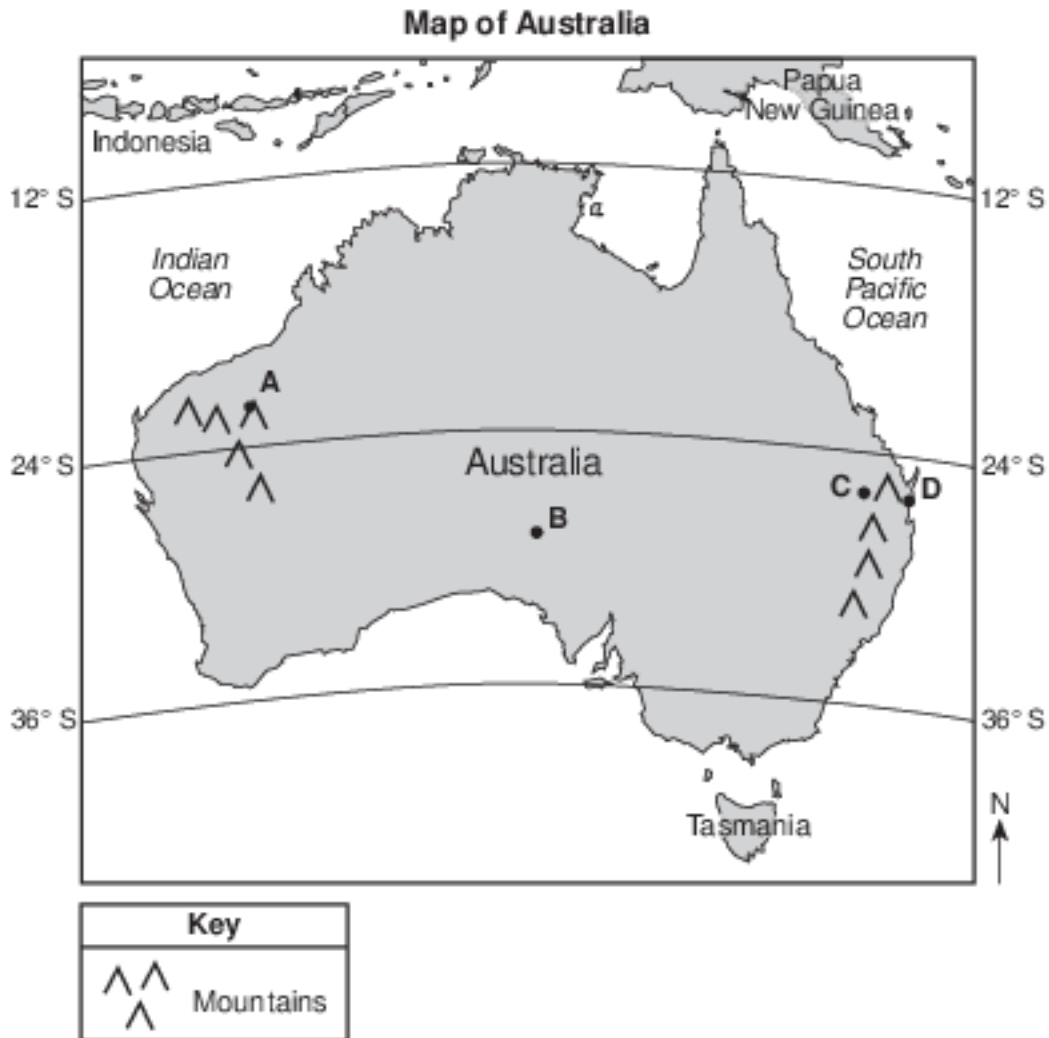
- 13 The average annual air temperature at location A is approximately 77°F, while the average annual air temperature at location B is approximately 55°F. Explain why location B has cooler average temperatures. [1]

Base your answers to questions 14 on the graph and map below and on your knowledge of Earth science. The average monthly temperatures for Eureka, California, and Omaha, Nebraska, are plotted on the graph. The map indicates the locations of these two cities.



- 14 Calculate the rate of change in the average monthly temperature for Omaha during the two-month period between October and December, as shown on the graph. [1]  
C°/month

Base your answers to questions 15 on the map of Australia below and on your knowledge of Earth science. Points A through D on the map represent locations on the continent.



15 Explain why location A has a cooler average yearly air temperature than location B. [1]

## Answer Keys

1 2

2 2

3 2

4 1

5 3

6 2

7 1

8 1

9 3

10 Allow 1 credit. Acceptable responses include, but are not limited to:

- — Calgary is surrounded by land, which has a lower specific heat than water.
- — Sitka is located near a large body of water, which has a higher specific heat than land materials.
- — The large body of water near Sitka moderates the temperature.
- — Calgary has a continental climate, while Sitka has a maritime climate.
- — Calgary is farther inland.

11 Allow 1 credit. Acceptable responses include, but are not limited to:

- — Location A is on the windward side of mountains.
- — Location A receives prevailing winds off the ocean.
- — Location A is closer to the ocean.
- — Location B is on the leeward side of a mountain range.
- — Adiabatic warming occurs in descending air at location B after losing most of its moisture on the windward side of a mountain/orographic effect.
- — The prevailing southwest winds bring moist air to location A.

12 Allow 1 credit. Acceptable responses include, but are not limited to:

- — elevation
- — altitude
- — height above sea level
- — Location C is on the top of a mountain.
- — Location D is at a lower elevation.
- — C is located in the mountains.

13 Allow 1 credit. Acceptable responses include, but are not limited to:

- — B is higher in elevation.
- — Higher elevations have cooler temperatures.
- — B is in the mountains.

14 Allow 1 credit for  $8\text{C}^\circ/\text{month}$  or  $-8\text{C}^\circ/\text{mo}$ .



15 Allow 1 credit. Acceptable responses include, but are not limited to:

- — The higher elevation at A has a cooler temperature.
- — Location A is at a higher elevation.
- — Location A is in the mountains.
- — Location B is not as high in elevation.