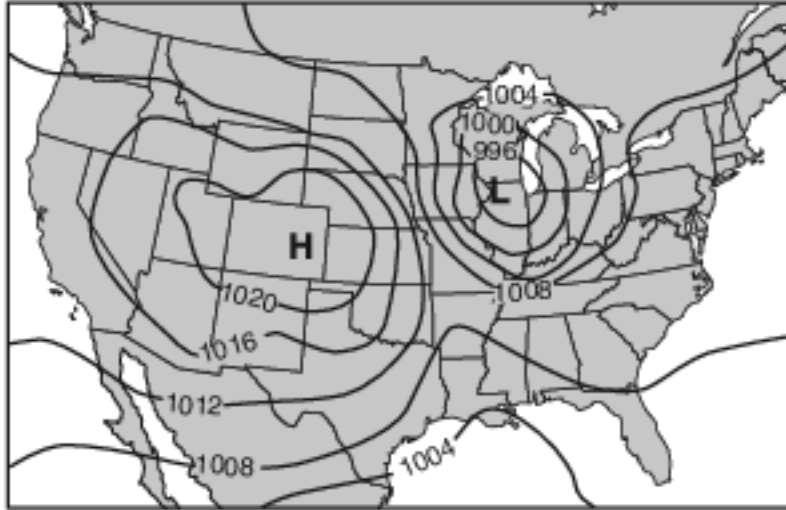


Surface Ocean Currents

Base your answers to questions 1 on the weather map below, which shows the locations of a high-pressure center (H) and a low-pressure center (L) over a portion of North America. The isolines indicate surface air pressures.



1 The arrows on which map show the most likely path in which these two pressure centers will move over the next few days?

(1)



(3)



(2)



(4)



2 Which ocean current brings warm water to the southeastern tip of Africa?

(1) Brazil Current

(3) Guinea Current

(2) Agulhas Current

(4) Benguela Current

3 What controls the direction of movement of most surface ocean currents?

- (1) density differences at various ocean depths
- (2) varying salt content in the ocean
- (3) prevailing winds
- (4) seismic activity

4 Which type of air mass would most likely form over the Pacific Ocean north of the Aleutian Trench?

- (1) mP
- (2) mT
- (3) cP
- (4) cT

5 Which current has a cooling effect on the climate of the west coast of South America?

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

6 Which ocean current directly warms Western Europe?

- (1) North Atlantic Current
- (2) South Equatorial Current
- (3) Canary Current
- (4) Labrador Current

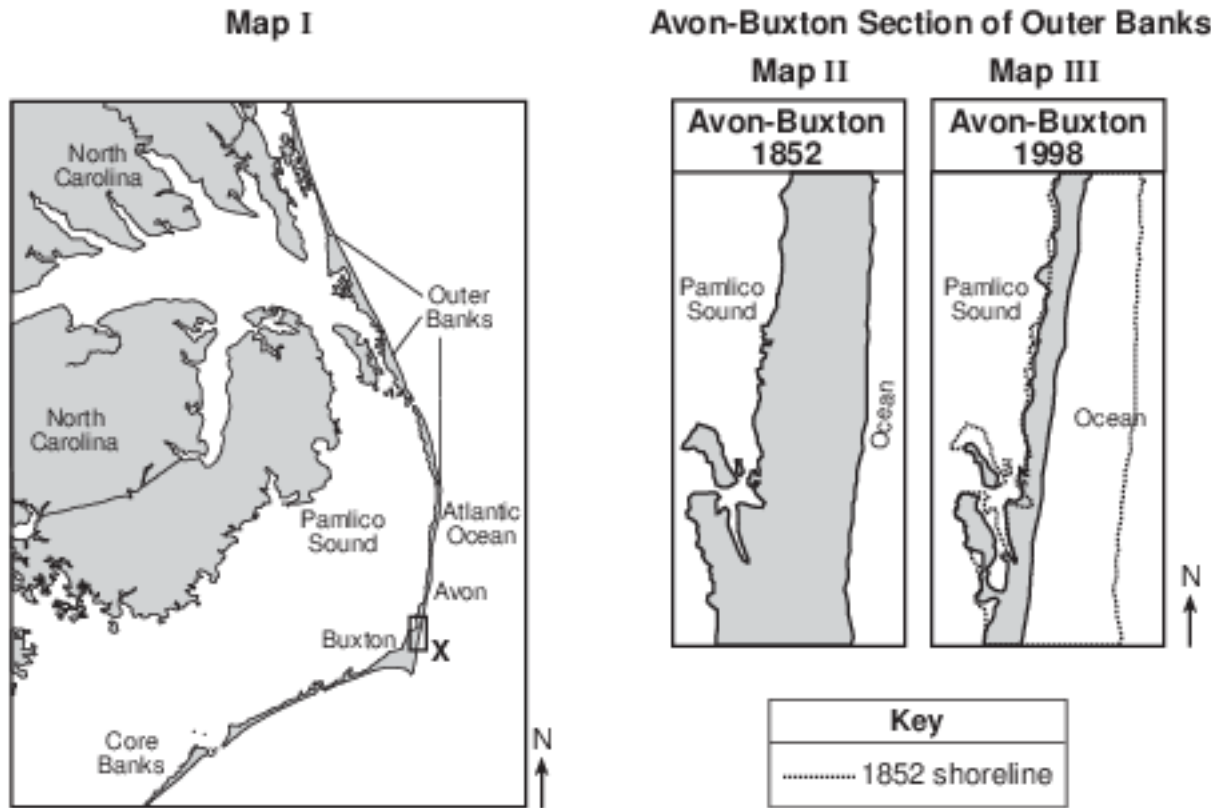
7 Which ocean current brings warm water to the southeastern coast of Africa?

- (1) Agulhas Current
- (2) Benguela Current
- (3) West Australian Current
- (4) Equatorial Countercurrent

8 Which current has a warming effect on the climate of the southeast coast of Africa?

- (1) Guinea Current
- (2) Falkland Current
- (3) Benguela Current
- (4) Agulhas Current

Base your answers to questions 9 on the maps and data table below and on your knowledge of Earth science. Map I shows the Outer Banks and part of North Carolina along the southeastern coast of the United States. Maps II and III show enlargements of the Avon-Buxton section of the Outer Banks indicated by box X on map I. Map II shows the land and shoreline in 1852. Map III shows the land and shoreline in 1998. The dotted line on map III shows the location of the 1852 shoreline. The data table shows the average width, in meters, at various years, of the Avon-Buxton section.

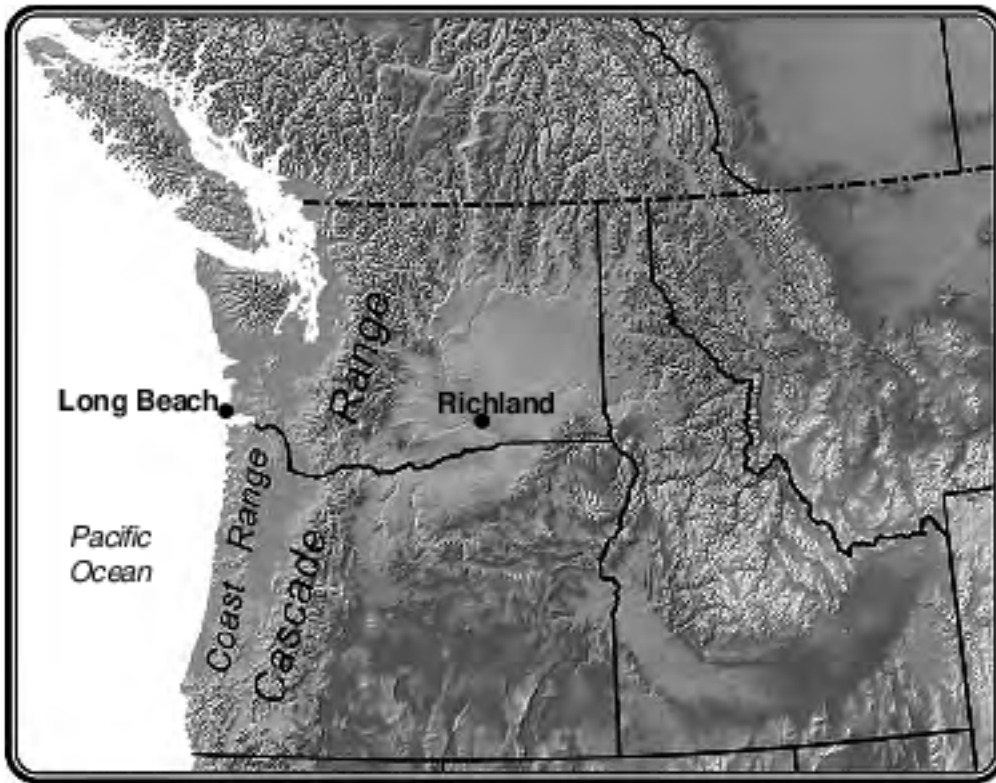


Avon-Buxton Section Width from 1852 to 1998

| Year | Average Width (m) |
|------|-------------------|
| 1852 | 813 |
| 1917 | 547 |
| 1940 | 426 |
| 1962 | 284 |
| 1974 | 284 |
| 1998 | 219 |

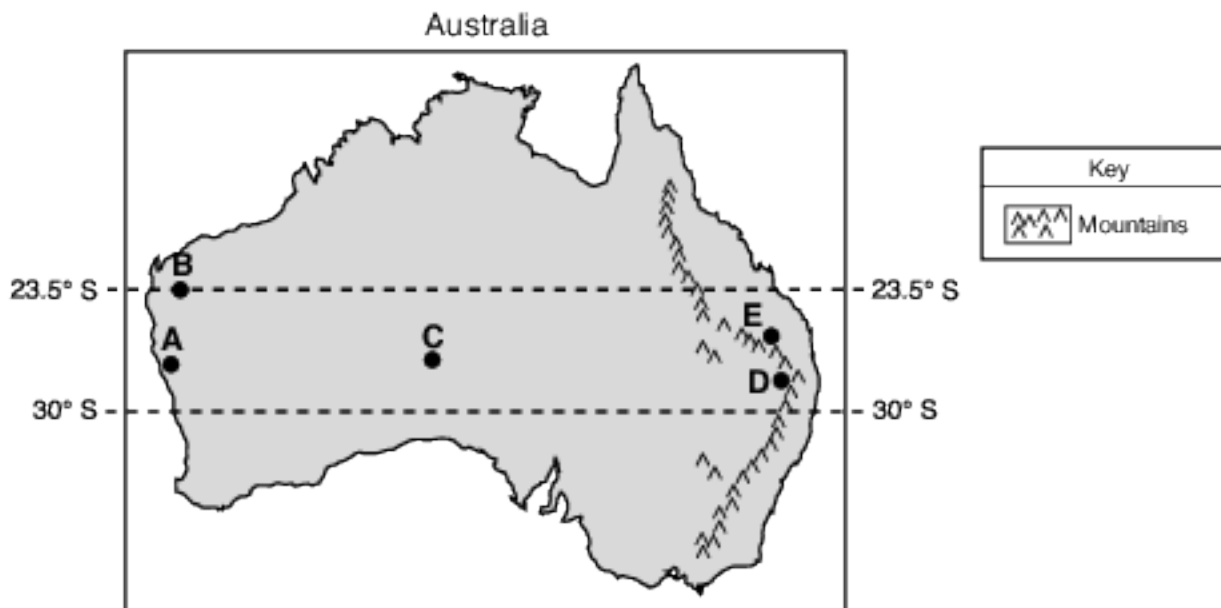
- 9 Which ocean current has the greatest warming influence on the climate of the Outer Banks of North Carolina?
- (1) Gulf Stream Current
 - (2) North Atlantic Current
 - (3) Labrador Current
 - (4) Canary Current

Base your answers to questions 10 on the map below and on your knowledge of Earth science. The map shows the locations of the Coast Range and Cascade Range in the Pacific Northwest of the United States and two cities in this region.



10 Identify the name of the cool surface ocean current that influences the climate of this region.
[1]

Base your answers to questions 11 on the map of Australia below and on your knowledge of Earth science. Points A through E on the map represent locations on Earth's surface that have different climates.



11 Identify the ocean current that most affects the climate of location A. [1]

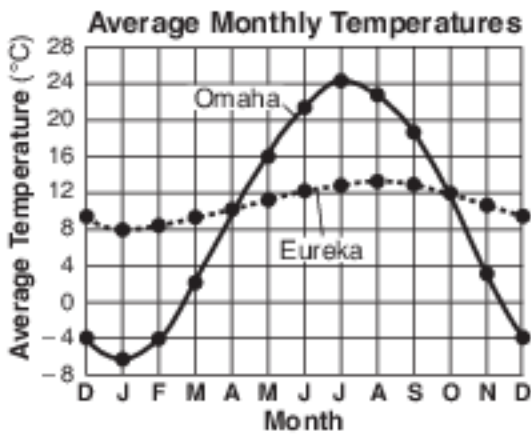
Base your answers to questions 12 on the passage below and on your knowledge of Earth science.

Coral Reefs and Ocean Currents

The location of shallow-water coral reefs is controlled largely by warm-water temperatures, which originate in tropical regions and are then widely spread by ocean currents. Major surface ocean currents flow in circular patterns called gyres. Ocean current gyres flow in a clockwise direction in the Northern Hemisphere, and flow in a counterclockwise direction in the Southern Hemisphere. This pattern of circulation generally moves warm water from equatorial regions into the shallow waters along eastern continental coasts. This extends the range of coral reef growth approximately 5° of latitude beyond both the tropic of Cancer and the tropic of Capricorn.

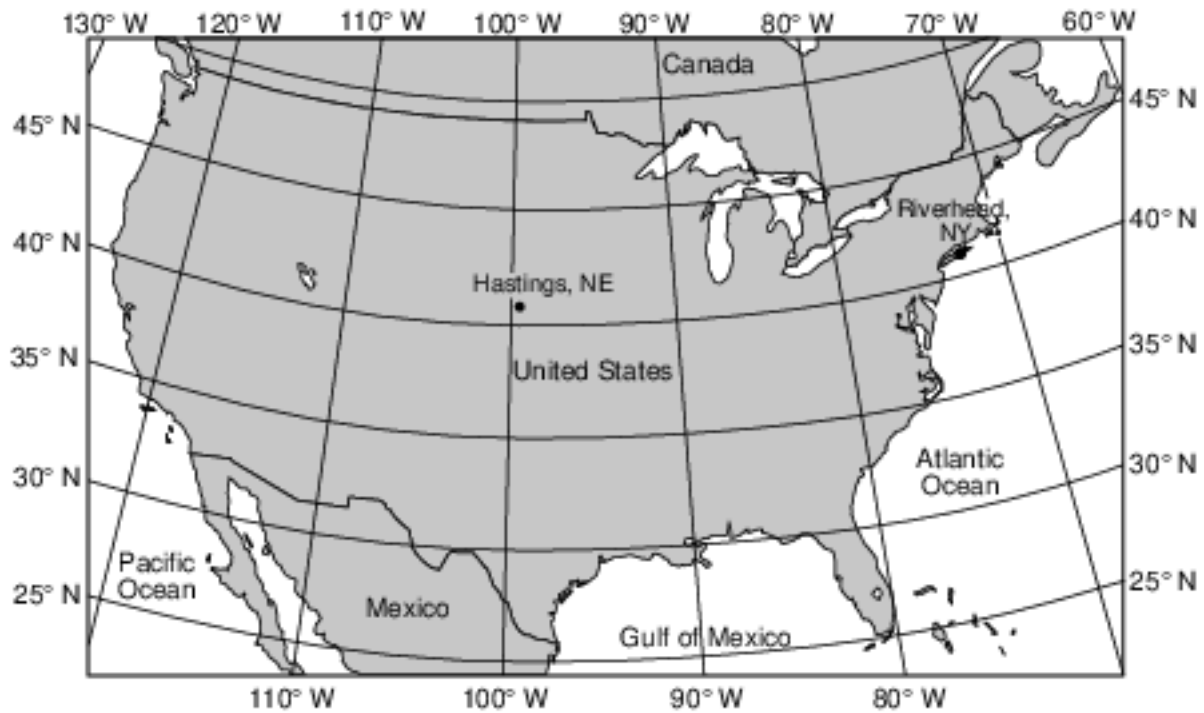
12 Identify the surface ocean current that prevents the formation of coral reefs in the shallow waters along the western coast of South America. [1]
Current

Base your answers to questions 13 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.

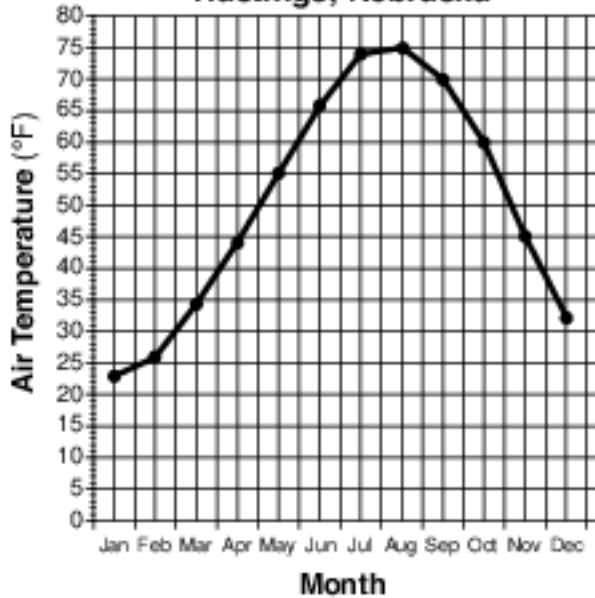


13 Identify the surface ocean current that affects the climate of Eureka. [1]
Current

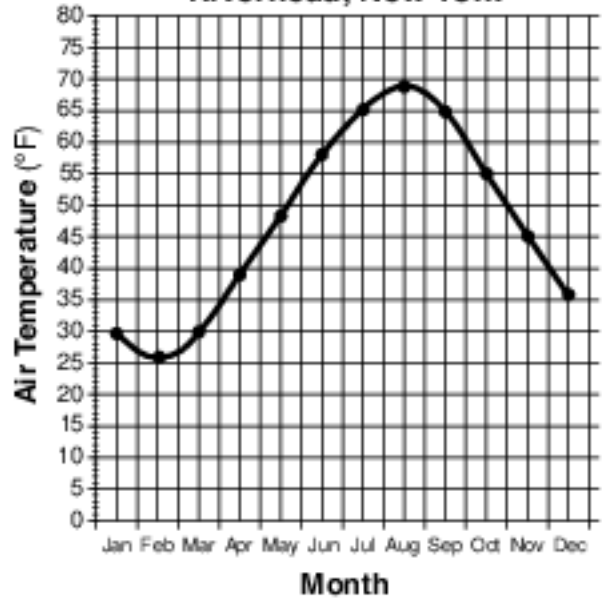
Base your answers to questions 14 on the map and graphs below and on your knowledge of Earth science. The map shows the locations of two cities, Hastings, Nebraska, and Riverhead, New York. The graphs show average monthly air temperatures for Hastings and Riverhead.



**Average Monthly Air Temperatures
Hastings, Nebraska**



**Average Monthly Air Temperatures
Riverhead, New York**



14 Name the ocean current that most likely has the greatest effect on the climate of Riverhead. [1]
Current

Base your answers to questions 15 on the passage below.

Mount Manaro Erupts!

Mount Manaro is a volcano on Ambae Island, about 1400 miles northeast of Australia. Ambae Island is located in the South Pacific Ocean at 15° south latitude, 168° east longitude.

After Mount Manaro had erupted in 1995, Ambae Island residents developed an evacuation plan. When Mount Manaro began erupting gas, steam, and ash on November 27, 2005, scientists and residents watched the volcano carefully.

The eruption became more severe on December 9, 2005, when steam and gases rose 1.8 miles up into the air. Rocks and ash began to fall on nearby farms and homes. Thousands of people left their homes, making it the largest evacuation ever on Ambae Island.

- 15 Identify the ocean current off the northeast coast of Australia that most affects the climate of Ambae Island. [1]

Answer Keys

1 4

2 2

3 3

4 1

5 2

6 1

7 1

8 4

9 1

10 Allow 1 credit for California Current.

11 Allow 1 credit for West Australia Current.

12 Allow 1 credit for Peru Current.

13 Allow 1 credit for California Current.

14 Allow 1 credit for Gulf Stream Current.

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

- — East Australia Current
- — South Equatorial Current
- — E. Australia C.