

Chapter **1** Section 5 Early European Explorers

Geography Application

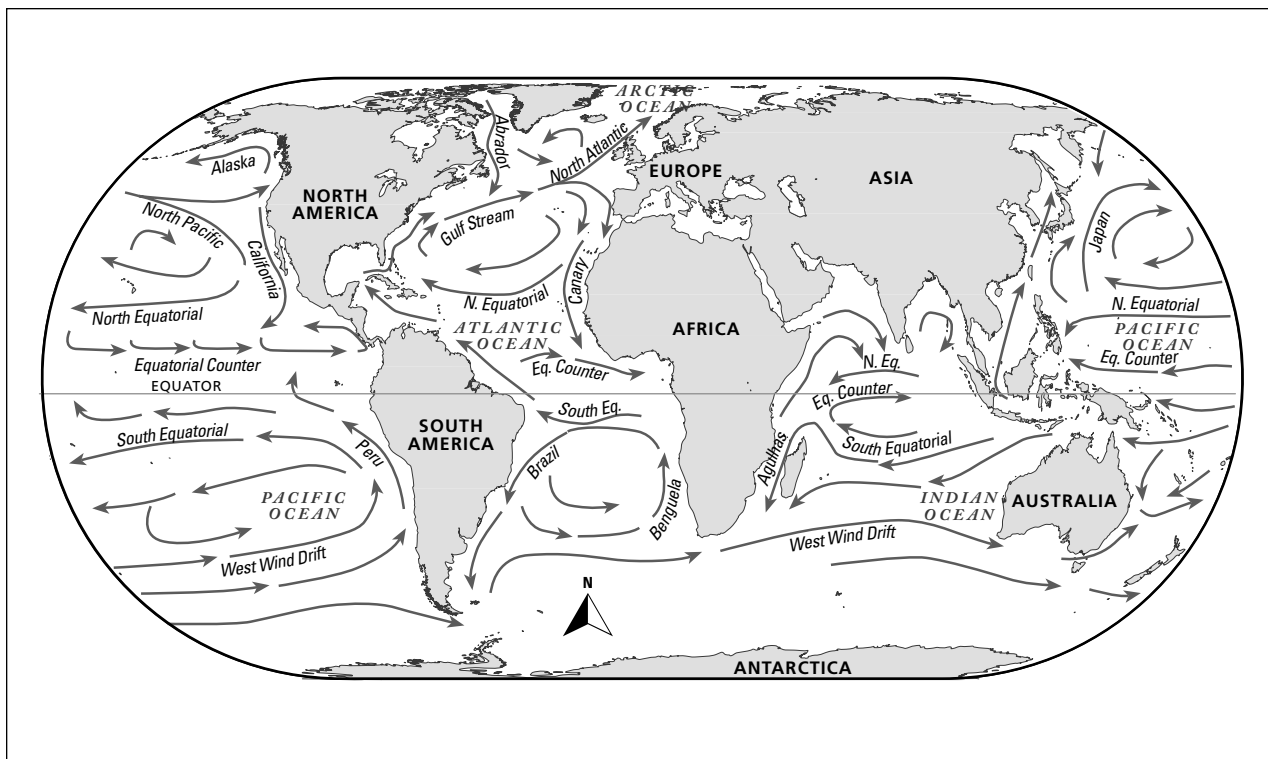
Ocean Currents

There are “rivers” in the ocean as well as rivers that cross the continent. Ocean rivers are called currents and are known by names such as North Equatorial and Gulf Stream. Surface ocean currents are pushed along by a pattern of winds. The pattern is established by the rotation of the earth and the large land masses. As a result, the currents move counterclockwise south of the equator and clockwise north of it. These currents are most circular in the wide-open waters of the Atlantic and Pacific oceans. Often, branch currents occur near shorelines.

This movement creates a global distribution of heat energy. Warm equator water moves north and south toward the poles. Colder Arctic and Antarctic waters then move toward the equator and are heated to repeat the cycle.

Occasional cycle interruptions called *El Niño* and *La Niña* cause worldwide weather disasters. *El Niño* is a warm current off the normally cold waters west of South America. It is created by shifts in wind direction. During a winter season, *El Niño* produces the extremes of flooding and drought in various places around the globe. Its reverse, *La Niña*, often follows in the next season. It is a dramatic cooling of currents in the same region. This causes floods and drought in places where *El Niño* has created just the opposite conditions.

For centuries, ocean-going vessels have taken advantage of ocean currents and accompanying winds. The map below shows the directions of many of these water systems.



Interpreting Maps and Text

1. Why do you think it was important for early explorers to have had a knowledge of ocean currents?

2. Which current would help an explorer sailing westward from Europe across the Atlantic Ocean?

3. Which currents would help this explorer sail along the east coast of North America and then return to Europe?

4. In terms of currents, if someone sailed from South America to Australia, what help could he or she expect?

5. An explorer in the 1500s sails near the coast of Africa to get from Europe to Asia. What part of the journey was probably the most difficult? Explain why.

6. Find the West Wind Drift south of the Equator. Why do you think there is no similar, though opposite, East Wind Drift north of the Equator?

7. Do you think knowledge of ocean currents is still important to modern-day sailors? Explain.

8. In what ocean are the conditions known as *El Niño* and *La Niña* found?
