

# Earth's Water

**Key Words** • hydrosphere • freshwater • groundwater • aquifer • watershed • estuary

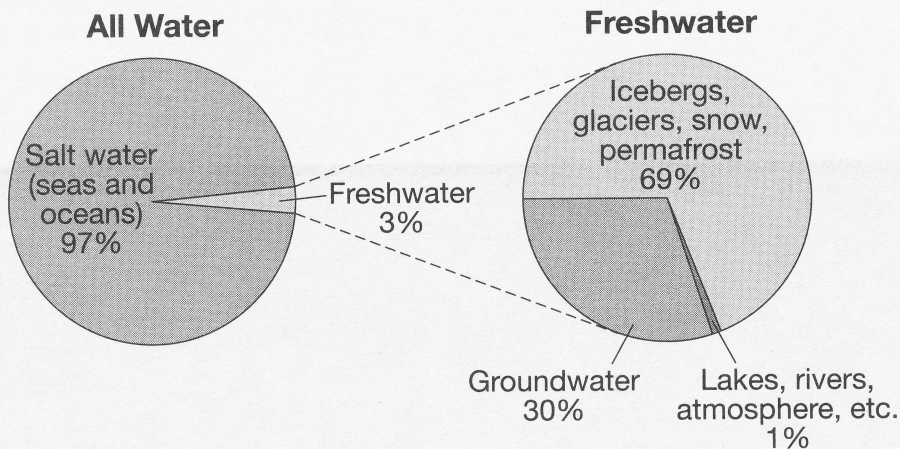


## Getting the Idea

Earth is a water planet. Water covers more than 70 percent of Earth's surface. The composition of all living things—people included—is more than 50 percent water. Living things on Earth need clean water to survive.

## The Hydrosphere

The **hydrosphere** is made up of all the water found on, above, and under Earth's surface. Most of this water is liquid. About 97 percent of Earth's water is salt water found in the oceans. The remaining 3 percent is **freshwater**—water that is not salty. Water is found in the solid state in polar ice caps, glaciers, snow, and permafrost. Liquid water is found underground and in lakes, wetlands, and rivers. The atmosphere contains water vapor. Recall from Lesson 19 that water changes from one state to another as it circulates through the hydrosphere in the water cycle. The circle graphs below show where Earth's water is found.



Most of Earth's freshwater is frozen in the polar ice caps. Ice covers nearly all of Antarctica and Greenland. Ice also covers most of the Arctic Ocean, near the North Pole. Glaciers contain large amounts of frozen water. A glacier is a mass of ice and snow that moves slowly over Earth's surface.

Nearly one-third of Earth's freshwater is **groundwater**, water located below Earth's surface. Groundwater collects as surface water moves down through soils and sediment to collect in spaces in underground rock. Groundwater moves through some layers of rock very slowly. It cannot flow at all through some rock layers.

An **aquifer** is a rock layer that collects and stores water. The freshwater we drink often comes from aquifers. People drill wells into aquifers to bring the water to the surface. As water is pumped out of an aquifer, more water moves into the aquifer. Aquifers are refilled slowly as water from the surface seeps down into the soil.

There are several aquifers in North Carolina. They form layers of groundwater separated by layers of rock that do not hold water. Some aquifers are near the surface of the land. Others can be as deep as 1000 meters below the surface.



Fifty-two percent of the people living in North Carolina get their drinking water from wells. Many homes have their own individual wells.

Water that collects above ground is surface water. Most of Earth's surface water is located in streams, rivers, lakes, and wetlands. A stream is a small body of flowing freshwater. A river is a large body of flowing freshwater, fed by other, smaller bodies of water. A lake is a large body of water surrounded by land. Lakes form in low areas where surface water collects. Wetlands are land areas that remain wet for all or part of the year. Wetlands act as natural sponges in an area. They collect and hold rainwater to prevent flooding. They also filter harmful chemicals out of water. Wetlands can improve the quality of water that will eventually become drinking water for communities.

Surface water includes runoff. Recall that runoff is water that flows over the land without sinking into the ground. Runoff from rain and melted snow moves water and materials from one place to another. It can move soil, rocks, and seeds. It can also move harmful chemicals. Water is a solvent. You learned in Lesson 4 that a solvent can dissolve other substances. As runoff flows overland, it dissolves chemicals in fertilizers and other substances on the ground. The runoff then carries these substances into lakes and streams. You will also learn more about runoff in Lessons 24 and 25.

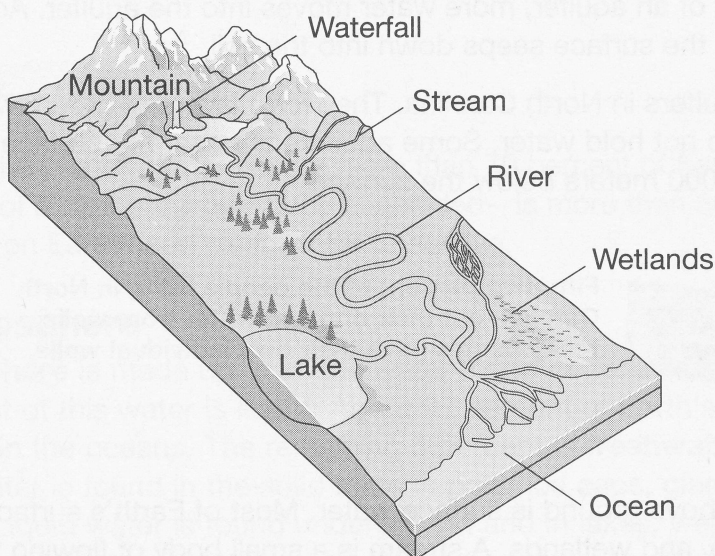
## Watersheds

A **watershed** is an area of land that drains into a stream, river, lake, or other body of water. Watersheds can measure just one square kilometer or many thousands of square kilometers. Watersheds are separated from each other by higher land areas called divides. Mountain ridges make up many divides. For example, ridges of the Rocky Mountains form the famous Continental Divide.



Within a watershed, precipitation collects and finally drains into one body of water, such as a river, a lake, or the ocean. The water moves from higher to lower elevations, as gravity pulls the water downhill. Groundwater and surface water both contribute to the water in a watershed. The watershed shown below drains into the ocean.

### Watershed Features



## North Carolina's Water

Water reaches rivers by smaller streams, or tributaries. The large watershed that contains a river and its tributaries is sometimes called a river basin. North Carolina has 17 major river basins. The Neuse River Basin is one of four river basins that are completely within North Carolina. Other river basins extend into nearby states.

The Neuse River begins in Orange and Person counties. It flows 400 kilometers to its mouth at Pamlico Sound. Pamlico Sound is an **estuary**, a body of water in which freshwater from a river meets and mixes with salt water from the ocean. The sound's salt water comes from the Atlantic Ocean. The Neuse River Basin contributes freshwater to the sound but is not the only source. Freshwater from the Tar-Pamlico Basin also flows into Pamlico Sound.

Not all of North Carolina's freshwater drains into Pamlico Sound. The Cape Fear River drains directly into the Atlantic Ocean. Also, some freshwater is held in lakes. A natural lake is a low area of land where surface water runoff accumulates. Artificial lakes can be created by building a dam across a river. The largest natural lake in North Carolina is Lake Mattamuskeet. The largest artificial lake in North Carolina is Lake Norman.

## Discussion Question

Can water from a small stream on a mountain affect an estuary hundreds of kilometers away? Explain your answer.



## Lesson Review

1. Which of these contain most of Earth's water?
  - A. oceans
  - B. rivers
  - C. lakes
  - D. glaciers
2. Where is most of the freshwater on Earth located?
  - A. in the oceans
  - B. in polar ice and glaciers
  - C. in rivers, streams, and lakes
  - D. under the ground
3. A rock layer that collects and stores water is called
  - A. an aquifer.
  - B. an estuary.
  - C. a glacier.
  - D. a hydrosphere.
4. An area of land that drains into a river or lake is called
  - A. an ecosystem.
  - B. a wetland.
  - C. a watershed.
  - D. a habitat.
5. Pamlico Sound is an estuary because it is
  - A. an area fed by several rivers.
  - B. an area that many watersheds drain into.
  - C. an area that is protected by land on both sides.
  - D. an area where freshwater mixes with salt water.