How Watersheds Work

by Tiffany Connors Science | Conservation Issues
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Every land mass eventually feeds into a body of water.

JOE SOHM/VISIONS OF AMERICA

Surely you've spent time cooped up at home during a rainstorm. Hours later, the land, streets and buildings outside look completely dry. Have you ever wondered where all that rain goes? We know that much of the water gets absorbed by the ground and by plants, but where does the rest of it end up? It eventually drains into the surrounding lakes and rivers, but it must get there via **watersheds**.

Where are these watersheds? Here's a hint: You're sitting in a watershed right now. The Environmental Protection Agency defines a watershed as any body of land that flows downhill into a waterway. Basically, "watershed" is a broad term used to describe how water flows across land to feed streams, rivers and lakes [source: Environmental Protection Agency]. All of these watersheds fit together like puzzle pieces to form our land masses.

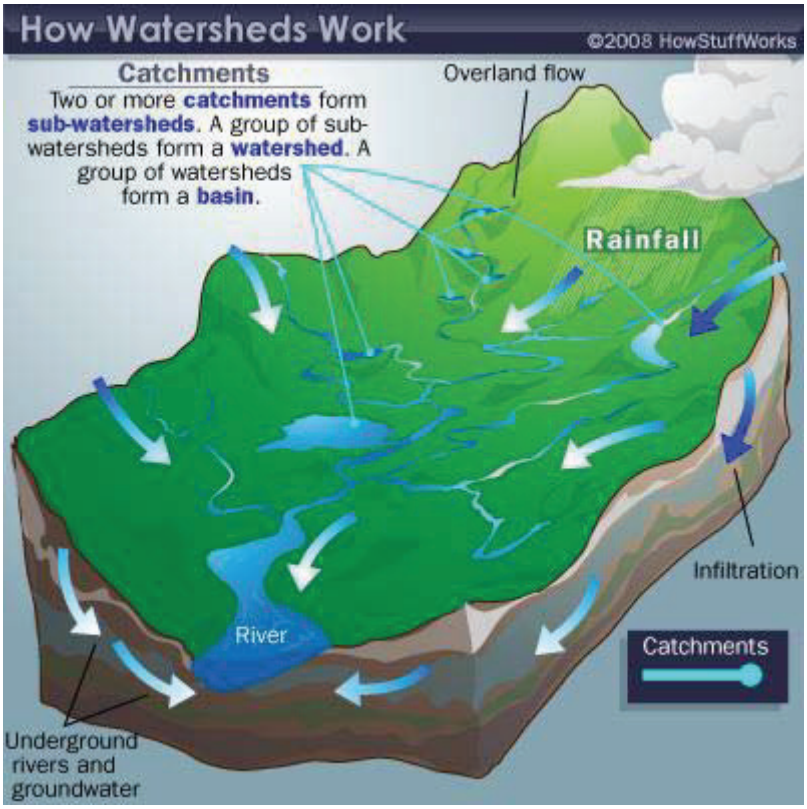
All land masses feed into a body of water, whether it feeds into the Mississippi River or your backyard pond. Obviously, water cannot travel uphill, so all watersheds are determined by topography. That means if you live on one side of a ridge and your neighbor is on the other side, you live in different watersheds. That also means that watersheds vary greatly in size, depending on the highest points surrounding it.

A watershed can be thousands of square miles, or it can be a few acres draining into a pond [source: Environmental Protection Agency]. There are millions of watersheds in the world - 2,100 small ones in the United States alone [source: NatureServe]. However, a watershed is more than just a piece of land that collects the rainwater and dumps it into the river. Anything that ends up in a watershed ends up in a body of water, including pollutants like discarded

motor oil or paint, or sediments from trees cut down due to construction. These and other pollutants can contaminate a water supply, erode the land surrounding the body of water and disrupt aquatic habitats.

Maintaining the health of our watersheds is vital to our ecology, but how does this affect you? Why should you care about watersheds? In this article, we'll explore watersheds and what they mean to you.

What Is a Watershed?



A group of sub-watersheds form a watershed.
HOWSTUFFWORKS

A watershed is an area of land that feeds all the water running under it and draining off of it into a body of water. It combines with other watersheds to form a network of rivers and streams that progressively drain into larger water areas.

Topography determines where and how water flows. Ridge tops surrounding a body of water determine the boundary of a watershed. Imagine turning an open umbrella upside down in the rain. Rain that hits anywhere within the umbrella's surface area would go to the bottom at the center of the umbrella. Any rain that didn't hit the umbrella would fall to the ground. The umbrella is like a watershed—it collects everything that falls into it.

Waterways within the watershed all feed into that main body of water, which could be a river, lake, or stream. The beginnings of a water source are called **headwaters**. The spot where headwaters progressively join other water sources is called the **confluence**, and the endpoint of the waterways that open into the main body of water is called the **mouth**. Source: Environmental Protection Agency.

To return to the umbrella e□ample, imagine now that there are three groups of umbrellas. One group of large umbrellas □the basin□sits on the ground, while another group of smaller umbrellas □watersheds□floats above them, with a hole in the bottom of each. Yet another group of even smaller umbrellas □catchments□floats above those, also with a hole in the bottom of each. If the rain was caught in the top level of umbrellas, it would drain into the larger umbrellas below, which would drain into the largest umbrellas below them.

Of course, this is a simple model. Water does not simply hit the land and roll off it into a stream. Rainwater □and everything else□is lost through absorption by plants, evaporation and consumption by humans. These factors also depend on the area□the clay-like soil of □eorgia will not absorb as much water as the loose soil of □ansas.

So, why do watersheds matter? Why is it imperative that they stay healthy? Read on to find out.

Where's My Watershed?

To find out which watershed you live in, take a look at the EPA's Surf Your Watershed. □or a map of U.S. watersheds, see the United States Watershed Map. The Water Resources eAtlas provides maps and biodiversity statistics on watersheds around the world.

Why Watersheds Matter

Pollution of a watershed can destroy an entire aquatic ecosystem, including its inhabitants.
DOUG MENUEZ/GETTY IMAGES

Now that you know what watersheds are, why should their health matter to you? Watersheds directly affect water quality, whether it's for drinking or recreation. □or e□ample, algae blooms from fertilizer runoff draining into water harm watershed health, as do mercury and lead seeping into the water supply due to pollution. As states and cities try to find new sources of uncontaminated drinking water, keeping watersheds healthy becomes increasingly vital to finding clean water [source: Environmental Protection Agency].

Unhealthy watersheds affect wildlife. The polluted water supply that results can become harmful to humans. Aquatic life quickly suffers the effects of watershed pollution, while new pollutants introduced into ecosystems alter wildlife habitats. This reduces biodiversity by eliminating some species and introducing new, invasive ones that destroy the native species. That, in turn, can

affect the food chain, from microbial organisms that feed birds and animals to fish that feed humans.

According to the EPA paper "Sustaining Healthy □reshwater Ecosystems," one freshwater ecosystem can be greatly affected by another: "□ar from being isolated bodies or conduits, freshwater ecosystems are tightly linked to the watersheds or catchments of which each is a part, and they are greatly influenced by human uses or modifications of land as well as water" [source: Environmental Protection Agency].

The threat of erosion also e□ists. Water flowing to a stream picks up dirt along the way. If the water picks up enough soil over time, the land along that stream will become unstable and eventually erode away. If you live along a river bank, this could mean losing your backyard. □or wildlife that lives in this area, it means a loss of their habitat.

The sharp increase in development around the world may contribute to some of the problems affecting watersheds today. □evelopment in the Amazon Basin has threatened the Amazon river dolphin with e□tinction [source: Water Resources eAtlas]. Urban development often involves removing plants, artificially changing the surface topography and altering naturally formed drainage networks. All of these factors affect an area's watershed. In addition, manmade land covers, such as asphalt roads or buildings, act as what the United States □eological Survey calls a "fast lane" for rainfall. Rainwater that would have been absorbed by soil and plants instead is sent directly into streams. These fast lanes increase the chances for flooding because more water pools in that area than a stream can hold [source: U.S. □eological Survey].

Read on to learn how we can protect the health of our watersheds.

World Water Monitoring Day

The EPA co-sponsors World Water Monitoring □ay on Sept. 1□. Between □uly and October, people in the U.S. can order a water testing kit, then register your site and data, and help to clean up your watershed. The monitoring period lasts until Oct. 1□.