

# Overview of Watersheds and Watershed Management

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A watershed, also called a "drainage basin" in North America, is an area in which all water flowing into it goes to a common outlet, such as the same estuary or reservoir. Watersheds themselves consist of all surface water and include lakes, streams, reservoirs and wetlands, as well as all groundwater and aquifers.

The water in a watershed originates via precipitation that is collected on the surface and groundwater. However, it is important to note that not all precipitation falling in an area exits the watershed. Some of it is lost through evaporation and transpiration, some is used by people and some soaks into the soil and groundwater.

At the boundaries of watersheds there are drainage divides usually in the form of ridges or hills. Here the water flows into two separate watersheds and does not always end up in a common outlet. In the United States for example, there are many different watersheds, but the largest is the Mississippi River basin which drains water from the Midwest into the Gulf of Mexico. This water does not enter the Pacific Ocean because the Rocky Mountains act as the drainage divide.

The Mississippi River basin is an example of an extremely large watershed, but watersheds vary in size. Some of the world's largest ones contain smaller watersheds within them depending on where the final water outlet is.

## **Types of Watersheds**

When studying a watershed's drainage divides, there are generally three different classifications used to describe them. The first is the continental divide; water is on each side of these flows into different oceans.

The second is called a major drainage divide. In this situation, waters on each side of the boundaries do not meet via the same river or stream, but they do reach the same ocean. For example, there is a drainage divide between the Yellow River (Huang He) basin and the Yangtze River in China but both have the same outlet.

The final type of drainage divide is called a minor drainage divide. In these, waters separate at the divide but later rejoin. An example of this situation is shown with the Mississippi and Missouri Rivers.

## **Key Features of a Watershed**

In addition to knowing what type of watershed a particular area falls under, there are several key features that are important when studying watersheds. The first of these is the size. Watersheds vary in size but larger watersheds have different characteristics than smaller ones because they drain a bigger area.

The second feature is the drainage divide or watershed boundary, such as a mountain range. This plays a role because it helps in determining whether the water in the watershed is flowing toward or away from an area.

The next feature is the topography or terrain of the watershed's land. If the area is steep, the water there is likely to flow quickly and cause flooding and erosion, whereas flat watersheds have often have slower flowing rivers.

The final feature of a watershed's physical landscape is its soil type. Sandy soils for example absorb water quickly, while hard, clay soils are less permeable. Both of these have implications for runoff, erosion and ground water.

## **Significance of Watersheds**

These features are all important when studying watersheds because watersheds themselves are significant to areas worldwide as people depend on water. It is the watershed that provides drinking water, as well as water for recreation, irrigation and industrial activities. Watersheds are also significant for plants and animals as they provide food and water.

By studying the key watershed features in addition to activities along waterways scientists, other researchers and city governments can work to keep them healthy because a small change in one portion of a watershed can drastically affect other parts.

### **Human Impacts on Watersheds**

Since most major cities around the world developed along waterways and those that didn't are still within a watershed, everyday human activities impact watersheds. The most significant however, is the pollution of watersheds.

Watershed pollution occurs in two ways: point source and nonpoint source. Point source pollution is pollution that can be traced to a specific point such as a disposal site or leaking pipe. Recently, laws and technological advances have made it possible to detect point source pollution and its problems are being reduced.

Nonpoint source pollution occurs when pollutants are found in water running off of crops, parking lots and other lands. In addition, it can also be caused when particulates in the atmosphere fall onto the land with precipitation.

Humans have also impacted watersheds by reducing the amount of water flowing within them. As people take water out of a river for irrigation and other city-wide uses, the river's flow decreases and with this decreased flow, natural river cycles such as flooding, may not occur. This could in turn hurt ecosystems depending on the river's natural cycles.

### **Watershed Management and Restoration**

Watershed management is the organization and planning of human activities on a watershed and recognizes the links between these activities and the watershed's health. In the United States the Clean Water Act was aimed at restoring and protecting water and today, a way of doing that is with a policy of watershed and resource management on federal lands.

Watershed restoration on the other hand is aimed at restoring already impacted watersheds to their natural state through the monitoring of pollution and regulations to reduce further pollution. Watershed restoration programs also work often to repopulate the watershed with its native plant and animal species.

### **Tasks**

A. Read the article thoroughly and make a concept map that defines the key ideas of the article.

B. Answer the following questions using complete sentences

1. What part of the water cycle supplies water to the watershed?
2. Describe how the boundaries of a watershed, "drainage basin" are determined.
3. Describe the Mississippi River basin.
4. Draw a picture of each type of water shed. Be sure to label divides and the river flow.
5. Describe the four key features used to define a watershed.
6. Explain why watersheds are important.
7. Describe the impacts that human pollution and water flow reduction make to a watershed.
8. What are the differences in watershed management and watershed restoration?

To learn more about watersheds in the United States, visit the Environmental Protection Agency's [Surf Your Watershed](#) website.