

What's a Watershed?

Not everyone lives next to a stream or pond but all of us live in a watershed. A watershed is what we call the land area that drains into a body of water. You can also think of it as the land area that drains to a common outlet, such as the outflow of a lake, the mouth of a river, or any point along a stream channel. If a drop of water falling into a watershed does not evaporate or become part of a plant or animal, it will flow out of the watershed through this outlet.



The path water takes across the land is determined mainly by gravity. High places -- ridges, mountains, and hills -- form divides between adjacent watersheds. Water always flows downhill—therefore the outer boundary of a watershed is formed by the ridges and hills surrounding a given waterbody. Precipitation (rain, snow, etc.) falling directly on the watershed boundary will be split between the watersheds on either side.

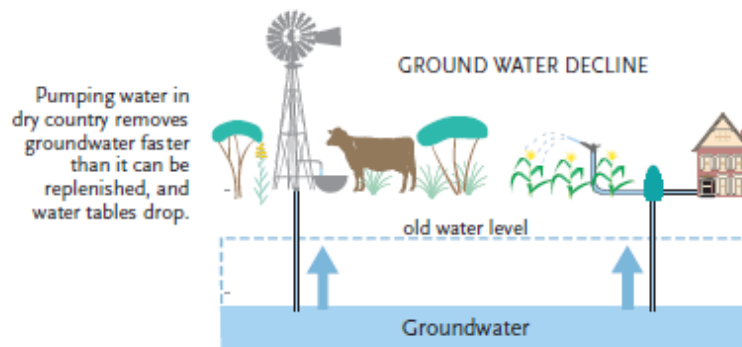
The Hudson River officially starts at Lake Tear of the Clouds in the High Peaks area of the Adirondacks and flows south for 315 miles to the Atlantic Ocean at New York City. The huge watershed of the Hudson covers about 13,350 square miles, which includes most of eastern New York and small parts of Vermont, New Jersey, and Massachusetts.

Parts of a Watershed

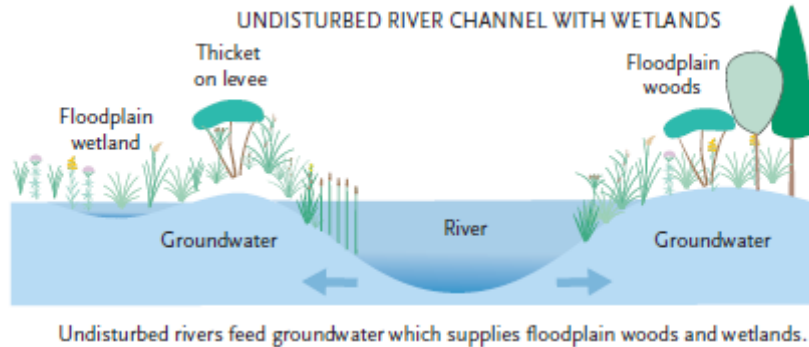
The watershed of most lakes and rivers consists of a network of streams, wetlands, human-made channels, storm drains, and the surrounding upland. At any point in the watershed, precipitation runs off of the land surface and collects in these natural and human-made drainage pathways. As precipitation moves, it follows the lay of the land, or topography. Some precipitation seeps into the ground, where it moves through the soil and may emerge at a nearby surface waterbody, such as a lake or stream. Other precipitation penetrates more deeply, replenishing regional groundwater supplies.

Groundwater

A groundwater reservoir, or aquifer, is a geologic formation that can store and release large amounts of subsurface water. Groundwater reservoirs have their own watersheds, known as



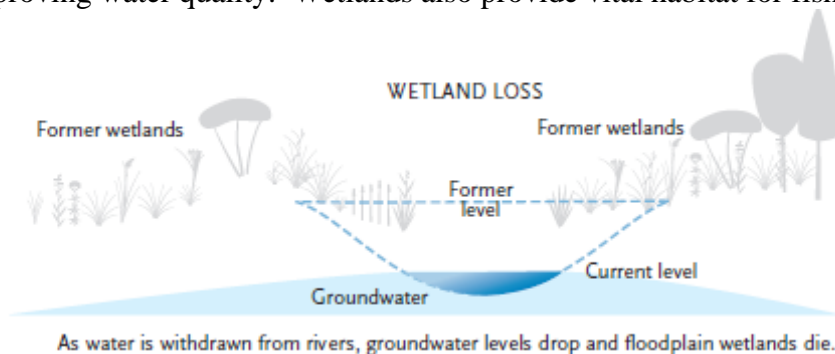
recharge areas, which consist of all the land contributing subsurface flow to a common location. The boundaries of a surface watershed and groundwater recharge area can, but do not always, coincide.



In recharge areas, surface waterbodies and groundwater are often interconnected. Occasionally, surface waters can provide a source of flow, or recharge, to the aquifer, especially when water tables are low. When water tables are high, groundwater can flow into lakes and streams and help maintain surface water levels. Lakes that appear to have no major inlet are often fed by groundwater. Sometimes humans withdraw too much water from an aquifer, resulting in serious problems. Many areas of the United States have had problems with collapsing land surfaces when the aquifer becomes so low that it cannot support the land above it. Imagine burying a balloon in the ground, and then slowly removing the air inside—eventually, the dirt above the balloon will fall.

Wetlands

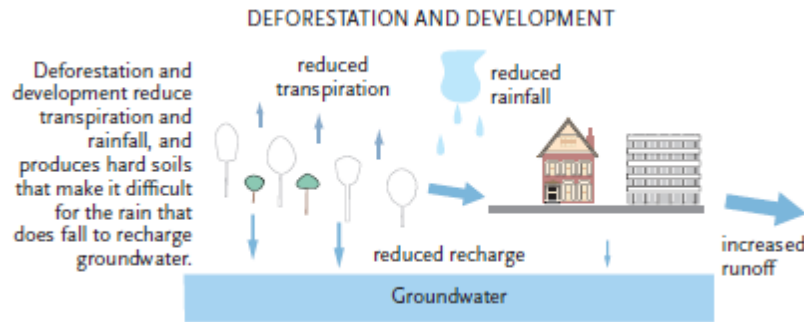
Wetlands, such as wooded swamps, marshes, and bogs, slow the flow of incoming water and temporarily store this water before releasing it downstream. This slowing and storage of water helps protect downstream areas from flooding. Additionally, slow movement of water through wetland vegetation helps to settle sediments and remove certain pollutants, thereby improving water quality. Wetlands also provide vital habitat for fish and wildlife.



When wetlands are filled or channelized these natural functions are lost. The consequences of this loss have been felt around the world. For example, the severe effects of the 2004 Indian Ocean tsunami and Hurricane Katrina would have been tempered had the natural wetlands in the Mississippi Delta been in place.

Uplands

Uplands are the drier, well-drained areas of the watershed. Most streams and lakes receive most of their water from the upland portions of their watersheds. Upland sites with sandy, coarse-textured soil readily allow precipitation to pass through them and serve as important groundwater



recharge areas. Uplands with fine-textured, less permeable soil may not provide significant groundwater recharge. Precipitation falling on these areas seeps into the shallow soil layers or moves slowly along the soil surface before collecting in small streams and wetlands. When uplands are developed by people, this natural absorption

and filtering process is bypassed. Precipitation falling on paved surfaces quickly washes downstream, picking up and carrying sediment and other pollutants, eroding streambanks and increasing flooding. Many communities now protect upland areas to preserve the quality of their water source.

The aquatic ecosystem

The watershed network makes it possible for pollutants to reach a waterbody located many miles from the pollution source. Groundwater recharge areas also transport pollution, although subsurface water moves much more slowly than surface water.

The materials that reach a river or lake through the watershed affect the chemical and physical environment in which a complex association of plants, animals and microorganisms exist. These interrelated organisms and their environment are referred to as the aquatic ecosystem. The watershed is part of this ecosystem. Changes in the watershed will affect other parts of the ecosystem downstream.

How people affect the aquatic ecosystem

We all live in a watershed. Our day-to-day choices can intentionally or inadvertently affect aquatic ecosystems, even when activities take place far from the shoreline. These changes include many common activities such as the construction of homes, roads, and shopping centers, and the cultivation of crops, lawns, and livestock. These activities can change the pattern of water flow in a watershed, increase the amount of water that reaches a waterbody, and allow it to get there faster without the opportunity for removal of pollutants by slow filtration through the soil. Inputs of nutrients, sediment, and toxic substances from human sources can seriously impair streams, ponds, and groundwater resources, impacting both wildlife and our water supply.