Teacher Tune-up

Quick Content Refresher for Busy Professionals

What Is a Watershed?

If a storm unleashes torrents of rain in a mountain range, where will flash floods threaten lives? When a river is dammed, what places will be flooded, and what places dried out? Where fisheries and farmers compete for the same water, what geographic area sets the stage for the problem and possible solutions? How has mercury from Gold-Rush–era mining operations ended up poisoning fish in the San Francisco Bay? Why is the Great Salt Lake salty? These are the kinds of questions that can make it useful to think in terms of watersheds.

At any point of confluence (like a fork in a river) or outlet (like the mouth of a stream entering a lake or an ocean), we can say that all the land upstream comprises a drainage basin, or watershed. (Occasionally the word watershed is used to refer not to a drainage basin but to the divide—the ridgeline—that separates drainage basins.)

While waterways typically make their way to the sea, there are also terminal (or endorheic) basins. These are watersheds that don't reach the sea, because water evaporates before its level rises enough to spill into a neighboring non-terminal watershed. The largest terminal basin in North America is the Great Basin, which sprawls over much of the western US and part of Mexico. Because the minerals that dissolve in runoff cannot reach the sea, they make the Great Salt Lake salty.



Seen from a distance, the earth's topography is sometimes reminiscent of a rumpled blanket or a crumpled piece of paper.

We can make a simple model of watersheds by imagining our crumpled paper as a landscape where runoff heads downhill. (An admittedly ungeological aspect of this model is that the topography determines water flow, but has not been influenced by that flow—this is not an eroded landscape.)





Where are the watersheds? Let's approximate the ridgelines and basins:

Like real watersheds, these models can be further subdivided into sub-watersheds. For example, the Great Southern River watershed of our paper landscape branches into East Fork and West Fork watersheds:



The scope of a watershed, the extent of land one chooses to lasso with an imaginary bounding line, depends on what one is curious or concerned about. Are you wondering about fertilizer runoff in a small farm's fishing pond? Depending on the topography around the farm, the watershed of interest could conceivably be just a few acres. Are you investigating the vast dead zone where the Mississippi River empties into the Gulf of Mexico? Then starting at the Mississippi Delta, you might want to consider the entire Mississippi watershed, which includes the headwaters of the Missouri, Arkansas, Red, Ohio, and Tennessee Rivers. Whatever outlet or confluence you start from, you include everything upstream—everything up to the boundary beyond which runoff flows somewhere else.



Several major watersheds of North America