

Know your watershed!

Background Information:

A watershed refers to the area of land where all of the water that is under it (e.g. ground water and aquifers) or on it (e.g. surface water like streams and rivers) flows into the same place. A watershed is like a funnel in that it collects all the water within an area (the wide part of the funnel) and moves it towards the same place (the narrow part of the funnel). Watersheds are not defined by political boundaries as they can cross city, state, and national boundaries. Watersheds are separated by topographically higher areas (highlands). Watersheds come in many sizes from very small watersheds encompassing a few acres to very large watersheds that cover tens of thousands of square miles. Ultimately, the water gets to the ocean. In many areas, the term watershed is synonymous with the terms drainage basin and catchment basin.

Streams and lakes reflect the characteristics of the watersheds they drain. When investigating the water quality of a stream or lake it is important to consider the characteristics of the watershed it is within. A water sample taken from a river, for example, is a synthesis of everything that has happened to the water before it reaches the point where the measurement is taken. Characteristics of a watershed that should be considered include topography, vegetation, soils, and land use. It can be challenging for students to understand the water that flows past them at a single point along a stream or river is greatly impacted by the watershed upstream.

Supplies needed:

- Plastic or metal tray
- Rocks, foil or white trash bags
- Sharpie markers
- Spray bottles of water
- Colored dye
- Cotton balls or water dropper
- Pictures of watersheds
- Sticks or pencils to point

Additional Supplies:

- Print big map of Niagara River watershed with sub-watersheds labeled
- Allow kids to mark where they live on the map

Points to get across:

- Water flows downhill (gravity)
- Watersheds are areas of land where all the water flows to the same place
- Ridges of higher land can divide watersheds
- Low-lying areas can create pools
- Water quality is affected by what is upstream (headwaters)
- Pollution from land can impact the water resources in a watershed

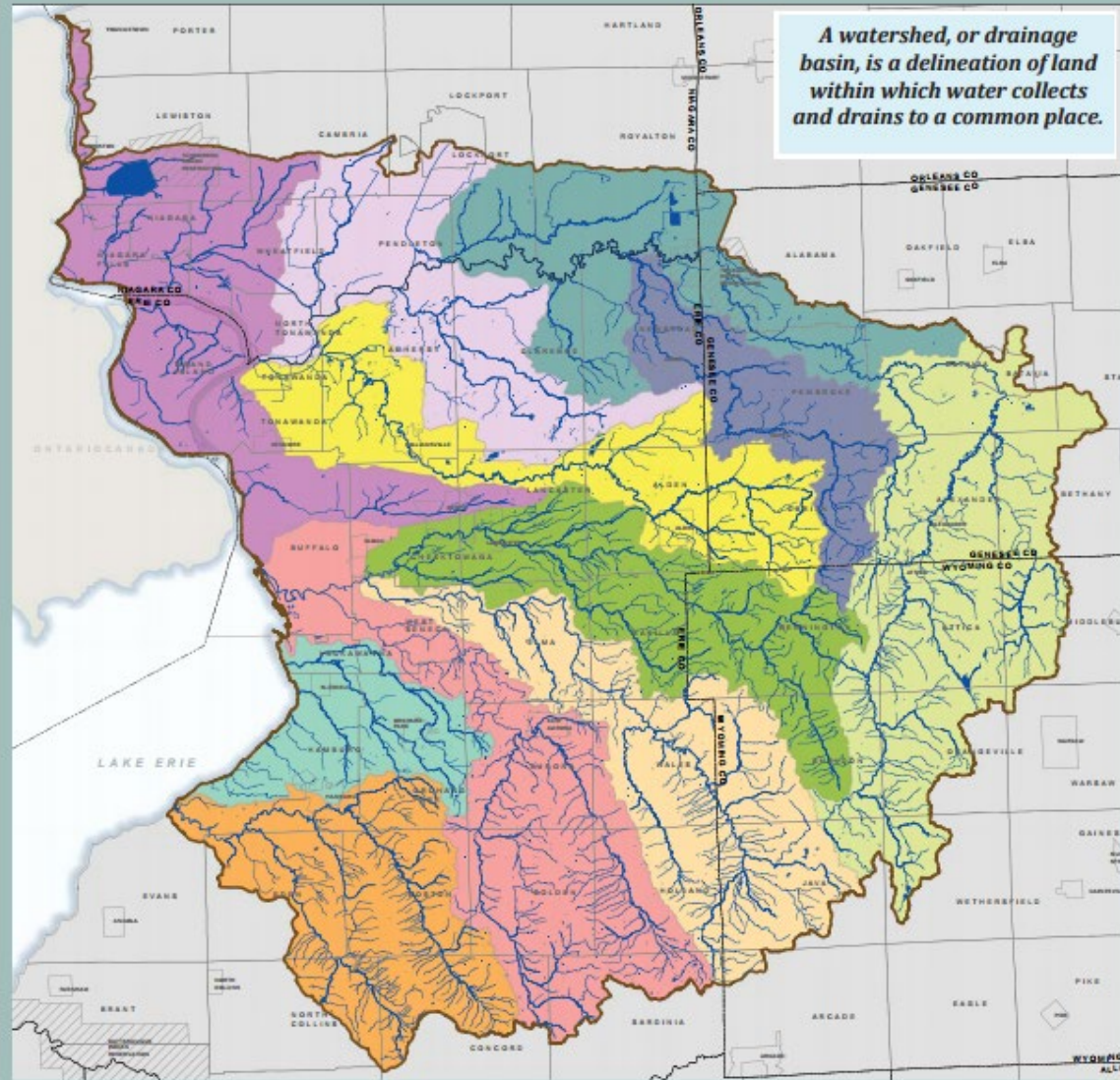
Activity Steps:

1. Make a model of the shape a land form: Arrange crumpled newspaper, rocks, or pinecones in the tray to represent the shape of the landscape. This is a model of a landscape with hills, valleys, and connections between them.
2. Add the surface of the land to your model: Place foil or a plastic bag over the rocks/newspaper. In this model, the plastic/foil represents the surface of the land.
3. Draw the waterways on your model: Think about rain falling in your model watershed. Where would the rainwater go? Where would rivers and streams form? Would there be any waterfalls? Where will the water form lakes or ponds? Draw the locations where you think rivers and lakes would form with a permanent marker.
4. Draw the boundary of a watershed on your model: Using a different color of permanent marker, draw the boundary of the largest watershed in your model. Also draw the boundary of a smaller watershed within the larger watershed. Mark a spot where you would like to live.
5. It's time for some rain! Use the spray bottle to 'rain' on the top of your highest 'mountain.' Continue raining until the water forms streams, rivers, and lakes.
6. How would pollution alter the water quality: Using a cotton ball soaked in red dye 'pollute' an area of your watershed. What areas are impacted by this source of pollution? How would wildlife be impacted?

Additional Questions to ask:

- Where did the water accumulate?
- How did the water flow over the surface of the land? Did you observe any patterns?
- What direction did the water flow? What caused the water to flow that way?
- How will humans affect the flow of water?

The Niagara River Watershed



Niagara River Watershed & Sub-watersheds:



Watershed Characteristics

Location

The Niagara River Watershed is located along the western most portion of New York State and encompasses lands that drain into the Niagara River, a channel that connects the Great Lakes of Erie and Ontario, while dividing the U.S. from Canada. Lake Erie and the two principal rivers of the watershed, Buffalo and Niagara, receive waters from over 19 smaller tributaries within the watershed.

The Niagara River Watershed is also part of the larger Great Lakes Drainage Basin (Map Inset). The Great Lakes Drainage Basin includes portions of eight U.S. states and the Canadian Province of Ontario, within which 33 million people reside.



Sub-Watersheds

In the Niagara River Watershed there are 11 sub-watersheds that outline areas of land that collect waters draining to the major tributaries of the Niagara River. (Please note sub-watersheds encompass other tributaries as part of their drainage geographies.)

- Niagara River
- Ellicott Creek
- Murder Creek
- Cayuga Creek
- Buffalo Creek
- Buffalo River
- Smokes Creek
- Eighteenmile Creek
- Lower Tonawanda Creek
- Middle Tonawanda Creek
- Upper Tonawanda Creek

These 11 sub-watersheds were utilized in the planning process to differentiate between areas of the watershed, as well as to identify priority sub-watersheds needing advanced planning (Phase II). See page 7 for Priority Sub-watersheds.

Topography

There is quite a variation in topography within the watershed, with rolling hills of the Allegheny Plateau found in the southern portion of the watershed, and a series of escarpment step-downs that create the flatter Erie and Huron Plains in the northern watershed. The Niagara Escarpment forms the watershed's most prominent feature, Niagara Falls, which separates the Niagara River into lower and upper portions. The flat low-lying areas of the northern watershed, coupled with hydric (wet) soils create vast expanses of wetlands where the historic Lake Tonawanda used to exist. It's in this area that the Murder Creek Sub-watershed hosts 7,190 acres of wetlands, and a large floodplain complex stretches from northern Amherst across three townships to the Tuscarora Reservation.

Niagara River Watershed Encompasses:

- 903,305 Acres of Land
- 3,193 Miles of Watercourses
- 11 Sub-watersheds
- 5 Counties: Erie, Niagara, Genesee, Wyoming & Orleans
- 71 Municipalities
- Cities of Buffalo, Niagara Falls, Lockport, Batavia, and Lackawanna
- 1,079,380 Residents

Weather Stats:

- WNY's climate is strongly driven by Lake Erie, with intense lake-effect snowfalls.
- Average Annual Precipitation ranges from 34.97 inches to 46.91 inches.
- From 1973 to 2010, annual average ice coverage on the Great Lakes declined by 71%².