

EXTREME STREAMS POSTVISIT MATERIAL

Thank you for visiting Mill Creek MetroParks. The naturalist staff suggests the following activities to expand upon material presented and to help students to understand what a watershed is and how pollutants can affect water quality in a watershed. Activities are adapted from *Environmental Education in the Schools: Creating a Program that Works!* By Judy Braus and David Wood, Peace Corps, 1993.

No matter where you live, you live within a watershed. Conditions within that watershed greatly affect the quality of rivers and streams flowing through it. After learning about watersheds, the students will have a better understanding of how water can become polluted. But before you do the activity, make sure they are familiar with some of the different types of water pollution (such as what was included in the pre-visit activity, "Fred the Fish".)

Upstream, Downstream

Ask students if they've ever seen splotches of oil in a parking lot or driveway. Then tell them that by doing this activity they'll find out what eventually happens to this oil.

Next introduce the term watershed. Explain that a **watershed** is an area of land from which rainwater and melting snow drain into a particular stream or river. Water sheds may be small areas of land that drain into small streams or huge areas of land that drain water into large rivers. Within each large watershed there are many smaller watersheds. A watershed is usually named after the stream or river drains into.

Point out that as rain and snow melt flow across land and into waterways, they wash over everything in their path: golf courses, roads, fields, lawns, woodlands, and so on.

Next pass out copies of the *Go with the Flow* activity sheet to the group. Tell the students to use the map at the top of the page to answer the questions at the bottom of the sheet. (If they are having trouble determining the boundaries of the watershed, have them look at the streams on the map to see which way they flow.

Those flowing into the Cedar River are in the Cedar River watershed.) Afterwards go over the page, using the answer sheet provided.

Local Waters

Now have students map the watershed they live in. Pass out state highway, regional, or topographic maps of your area that show a stream or river flowing through (or near) your community. (For topographic maps of your area contact the U. S. Geological Survey, Map Sales, Box 25286, Denver, CO 80225). Also pass out sheets of tracing paper, markers or colored pencils, and masking tape. Instruct the students to follow these directions:

- 1) Find your community and the nearest stream or river on the map. Then tape tracing paper over that section of the map. (Note: As discussed in the answers to the above activity, slope is the factor that separates one watershed from another.) Depending on the slope of the land in your area, the watershed, or the nearest stream or river may or may not include your community. The only way to tell is to look at slope on a contour map. For this activity, you can assume that your community is in the watershed of the nearest stream.
- 2) Use a colored pencil or marker to trace the stream or river downstream until it joins a larger river. Use the same colored pencil or marker to trace the stream upstream as far as you can and to trace all of the tributaries that dump into the river or stream all along its length.
- 3) Use a different colored pencil or marker to trace other streams and rivers in your area.

- 4) Outline the watershed you live in. (Remind them that the watershed they live in is made up of all the land that drains into the nearest stream or river. So, to outline the watershed, they should be outlining the land surrounding the nearest waterway and all its tributaries.)

Afterward discuss the following questions as a group:

- 1) What types of things do rainwater and snow melt flow over in your area? (rooftops, sidewalks, roads, agricultural land, lawns, golf courses, and so on)
- 2) What kinds of pollutants might rainwater or snow melt pick up as they flow through your area? (Rainwater and snow melt that run over streets, parking lots, fertilized yards, construction sites, and so on, often pick up toxic chemicals, silt, and other pollutants. The water then flows into storm drains that empty into rivers. Water running off agricultural land often contains high amounts of animal waste, pesticides, fertilizers, dirt, and other pollutants.)
- 3) In what other ways might your community affect water quality? (Some industries dump pollutants directly into rivers; pollutants from overflowing sewage treatment facilities may wash directly into waterways; pollutants from landfills or dumps may leak into water supplies, and so on.)
- 4) Which nearby communities might be affected if your community dumped untreated sewage into the nearest stream or river? (those downstream) Which communities could affect water quality in your community? (those upstream)
- 5) Finally, ask what happens to the oil splashes you talked about in the beginning of the activity. (The oil may wash into your local stream or river and be carried downstream.)

Related Websites

Many classrooms now have Internet access. Below are some interactive sites about macroinvertebrates, pollution, etc. That your students may enjoy:

Bridging the Watershed

www.bridgingthewatershed.org/dichot2

Virtual Pond Dip

www.naturegrid.org.uk/pondexplorer/pond3.html

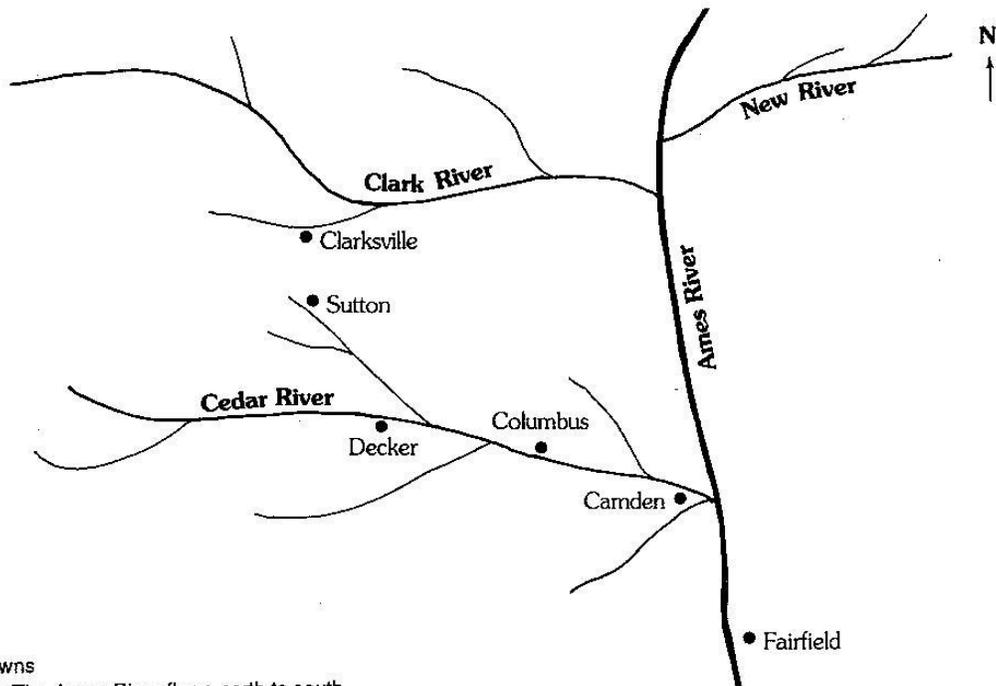
What's Wrong with this Picture?

www.epa.gov/owow/nps/kids/whatwrng.htm

Masterbug Theater

www.epa.gov/owow/nps/kids/BUGTHTR.htm

GO WITH THE FLOW



• Towns

Note: The Ames River flows north to south.

1. Find the Cedar River and all the Cedar's tributaries—the smaller streams and rivers that flow into it. Then outline the Cedar River watershed.
2. What larger watershed is the Cedar River watershed a part of? What other rivers are part of this watershed?

3. There's a chemical manufacturing plant in Decker that dumps its waste into the Cedar River. What communities might be affected by this waste? Explain your answer.

4. Which river or rivers would animal waste and other pollutants from farms near Sutton wash into? What about from farms near Clarksville? Why would you think that Sutton and Clarksville are in two different watersheds? Is it possible for Sutton and Clarksville to be in the same watershed? Explain your answer.

5. Eventually the Ames River empties into Lake Churchill. Two other large rivers also empty into Lake Churchill. What effect might these three rivers have on conditions in the lake?

Go With The Flow Answer Sheet

1. See diagram below.
2. Ames River watershed, Clark, and New
3. Columbus, Camden, and Fairfield because they are downstream from Decker
4. Cedar River, then into Ames River; Clark River, then into Ames River. Because Sutton is closest to the Cedar River and Clarksville is closest to the Clark River. They could, however, be in the same watershed, depending on the slope of the land. For example, if a mountain or hill separated Clarksville from the nearby stream, wastewater from Clarksville could flow into the Cedar River Watershed. It's more likely though that Sutton is part of the Cedar River watershed and Clarksville is part of the Clark River watershed (Note: They are both in the same larger Ames River watershed).
5. Many of the pollutants carried by the Ames and the two other rivers--pollutants that were collected from large areas of land--would end up in Lake Churchill; as pollutants accumulate in Lake Churchill, water quality could decrease significantly and aquatic plants and animals could be affected.

Explain that as rivers empty into bays, lakes, and other bodies of water, some of the waste they're carrying can accumulate in these areas. This accumulation can create big pollution problems. For example, Chesapeake Bay and the Great Lakes are suffering from the accumulation of pollutants flowing into them.

