



## Exploring Your Watershed



Originating as a tiny outlet stream for a northern Minnesota lake, the Mississippi River progresses into a river system that drains all or parts of 31 states before reaching the Gulf of Mexico.

**N**o matter where you live, your daily actions are inseparably linked to water. Water used for drinking, household needs, agriculture, recreation, and industrial uses that support our livelihoods is dependent upon healthy local, regional, and national water supplies. As a result, our actions have a significant impact on the quantity and quality of these water sources. By exploring the local and regional *watershed* in which we live, we can begin to increase our awareness local watershed issues and make a valuable contribution to water quality protection.

### What is a Watershed?

A watershed is the *entire area of land* that drains into a specific river or river system. Water drains from the highest elevations within the watershed to the lowest, contributing to a particular stream, river, or lake. Sometimes called a *drainage basin*, a river's regional watershed includes the many smaller local watersheds of the creeks, feeder streams, lakes, and wetlands that drain into it.

### How Do Land-use Practices Affect Water Quality in The Watershed?

Your nearest stream carries water from your land and the entire surrounding landscape—including roads, parking lots, buildings, construction sites, shopping areas, dumps, and green spaces—eventually into major rivers, lakes, or groundwater. When rainwater and melted snow drain off the land they carry sediments, pollutants, and other dissolved materials into the water sources in your watershed.

### What kinds of pollutants flow from non-point sources?

- Excess fertilizers, herbicides, and insecticides from agricultural lands and residential areas
- Oil, grease, and toxic chemicals from urban runoff and energy production
- Sediments from improperly managed construction sites, crop and forest lands, and eroding stream banks
- Salt from roads and irrigation practices
- Acid drainage from abandoned mines
- Bacteria and nutrients from livestock, pet wastes, and faulty septic systems
- Chemicals including nitrogen and acids from atmospheric deposition of industrial smokestacks, combustion of fossil fuels such as coal and oil, automobile exhaust, and agriculture

### Sources of Water Quality Information

If you want to know where your wastewater or gutters drain, you can call your city's Water Department or Sanitation Bureau. Your local filtration plant is another good source of water quality information.

Because water is always moving, what happens in one area can have a significant positive or negative impact on water quality in other parts of the watershed. For instance, wetlands help to filter and clean surface water of sediments, nutrients, and toxins via a diversity of biological and physical processes. If wetlands are lost or degraded, the watershed's ability to produce clean water can be substantially reduced. Likewise, if streams are disturbed or overwhelmed by increased runoff from roads, logging, or developed areas, their banks can become unstable sources of sediments, thereby impairing water quality.

## What are the Primary Threats to Water Quality?

Contrary to popular belief, industrial outlet waste pipes are not the leading cause of water pollution. It's the combined impact of many unregulated sources of pollution, or *non-point source pollution* that contributes most to water quality degradation.

The most significant sources of non-point source pollution vary greatly depending on the land uses in a given watershed. Sources including agricultural and urban runoff, parking lots and roads, and storm drains contribute heavily to watershed contamination.

## Why is Watershed Protection so Important?

All living things, *including people*, are inextricably linked to the watershed in which they live. Watershed protection contributes to suitable drinking water, irrigation supplies, stormwater management, recreational opportunities, wildlife habitats, and the healthy functioning of river systems. In less developed nations, water quality protection remains the cornerstone of public health. By becoming more aware of your connections to your watershed, and doing your part to reduce harmful impacts, you can make a meaningful contribution to water quality protection.

## Getting Started

### Step 1: Identify Your Watershed.

To define your watershed, identify the nearest major river to where you live. If you live in a coastal area or the Great Lakes region, the nearest major water body may be a bay, or one of the Great Lakes. This is your *regional* watershed. For example, Audubon International's headquarters lies closest to the Hudson River. Thus, we are located in the *Hudson River watershed*.

However, it is helpful to be even more specific in identifying your watershed. What stream or creek is nearest to your property? It is into this stream that water from your land and other properties around you drains. This nearest stream is your *local* watershed. Again, using our office as an example, the Onesquethaw Creek flows through our property. Thus, we are also in the *Onesquethaw Creek watershed*.

### Watersheds on the Web

- [www.ctic.purdue.edu/KYW/](http://www.ctic.purdue.edu/KYW/)
- [www.epa.gov/surf3/](http://www.epa.gov/surf3/)

## WATER QUALITY TESTING

Baseline water quality data for representative water bodies and water sources that may be affected by land management practices can be obtained by testing:

- Physical characteristics- tests for dissolved oxygen, pH, temperature, and specific conductivity.
- Nutrients- tests for nitrogen (nitrate and ammonia), and total phosphorus.
- Macroinvertebrates- surveys for aquatic organisms, particularly where water enters and exits the property to determine water quality in streams.
- Baseline tests should be conducted 4 times a year for at least one year.
- Re-test water sources should problems occur, or one time per year.

If you have a feeder stream or creek on your property, it's easy to identify where water from your land drains. If not, take a look for streams near your property; a good clue may be as close as the nearest bridge. Consult a map for the names of local streams.

### Step 2: Explore Your Watershed.

Using a map of your local area, trace your local watershed stream to its source and then follow it to its final destination—the major river or other water body into which it drains. Note smaller feeder streams that enter it along the way.

Next, take a walk or drive to explore land uses within your watershed. You may want to start at the source and follow a route that intersects the waterway as it flows downstream. Stop at various points to check out water quality and note land uses and potential pollution sources along the way. Are there areas dominated by agriculture, industry, new developments, or urban centers? Are there forested or wetland parcels that provide natural filtration and wildlife habitat? If possible, observe the water quality of the final drainage place. How does water quality change as it flows through the watershed?

**(MAP GRAPHIC)** You can learn a lot about your local watershed by making a map of it. Your map can be based on an actual topographical map or you can make a schematic map starting at the water source and flowing to the stream's endpoint. Even a simple schematic map like the one pictured here can help you to see how land uses in a watershed may impact water quality. This is an especially good project for teachers or parents to do with kids.

### Step 3: Evaluate Your Impact and Take Steps to Reduce Potential or Actual Pollution.

What you do on your property can affect water quality both on and off-site. As you begin to plan effective water management strategies, try to answer the following questions: How does water enter your property: rain/snow melt, wetland, springs? What is the lowest point or points where water settles? Does it pick up any contaminants because of your land use practices? Where does water go when it leaves the property? Does water quality improve, decline or stay the same as it moves off your land?

If you do have a stream or pond on site, you can test its water quality to see whether land uses or management practices are having an impact (*see side bar*). You can also evaluate potential impacts based on visually inspecting and evaluating various sources of pollutants. Use the enclosed chart as a guide for some of the leading ways to avoid contaminating your local watershed.

By familiarizing yourself with your local watershed and taking steps to protect water quality, you will nurture your connection to this most vital resource. More important, you will come to appreciate how critical your efforts to maintain good water quality really are.



Visit our online information center for fact sheets on a variety of environmental topics:

[www.auduboninternational.org/e-source](http://www.auduboninternational.org/e-source)

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Pollution Source	The Problem	What You Can Do
Your Car	Oil, gas, and other fluid leaks are all sources of watershed pollution. Auto exhaust contributes to atmospheric deposition of toxics into waterways.	Regularly check you car for leaks and repair problems promptly. Make a commitment to reduce the amount of driving you do; combine trips, carpool, walk, etc.
Chemical Storage, Use, and Disposal	Products such as gasoline, motor oil, pesticides, and fertilizers <i>must be</i> properly stored, used, and disposed of to prevent pollution. Error and carelessness often cause water quality contamination.	Be sure storage containers and storage areas are leak proof. Always store liquid chemicals <i>below</i> dry products and on metal or plastic shelves. In case of a spill, the liquid products won't contaminate the dry materials. If you choose to apply chemicals to your property, select <i>slow release</i> or <i>natural organic</i> products. These are less likely to wash into waterways. Always read and follow label directions. Dispose of chemicals and containers via hazardous waste collection, recycling, or proper disposal.
Trash Disposal	How often do you see garbage on the side of the road and in waterways? Garbage damages the beauty, health, and safety of water sources and diminishes recreational and aesthetic value. Dumping trash into waterways is against the law.	NEVER litter. Properly secure garbage cans and recycling materials for curbside pick up. Consult your local town or waste-hauler for proper hazardous waste disposal.
Parking Areas	Runoff from parking areas has a direct negative impact on water quality.	Inspect parking areas and parking lots for signs of automotive leaks. Allowing water to filter through grassy or forested areas before reaching storm drains or water sources helps to filter pollutants from parking areas.
Auto, Mower, and Small Equipment Maintenance	Spilled motor oil, gasoline, and lubricants can quickly contaminate wells and streams and damage aquatic organisms.	Use a funnel to add new oil or gasoline. Replace the lid and carefully store containers of petroleum products to avoid accidental spills. Change motor oil or fill gas away from water bodies. Dispose of used petroleum products properly. Most gas stations or oil-lube businesses will take your used oil.
Septic Systems	Failing septic systems slowly leach organic wastes. These can cause excessive algae growth. Pathogens, such as bacteria and viruses may also enter the water and cause disease.	Have your septic system cleaned every three to five years. Do not pour household chemicals down the toilet or drain—they can destroy beneficial bacteria in the septic tank. Also, keep heavy vehicles away from the system—they can crush drainage tiles. If your leach field or septic tank is old or worn out, repair or replace it.
Cleaning Products	Phosphates, chlorine, and other toxic chemicals may harm local water supplies.	Avoid buying toxic household products. Read labels and purchase phosphate-free and least toxic products that are safe for septic systems. Avoid chlorine bleach. Don't dump hazardous chemicals down the drain.
Erosion	Plowed fields, overgrazed pastures, construction, gullies, and logging can cause stream bank erosion. When soil washes into waterways, it clouds the water and degrades aquatic habitats.	Stabilize stream banks and lake shorelines. Re-establish vegetation as soon as possible whenever soil is exposed. Regrade and seed gullies to stabilize soils. Fence livestock and prevent animals from trampling in waterways. Address loss of agricultural soils due to erosion.