

# Water Quality Monitoring (Overview)

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This section provides only a *brief* overview of these topics in order to help the reader choose among the options. Several organizations offer extensive training and resource materials for the various types of monitoring. (See Resources, pages 20-21.)

Regular water quality monitoring informs citizens and agencies about the essential health of a waterbody, allowing for the best possible management and policy. By monitoring local water bodies, youth can serve as “watch dogs” for local units of government

and provide useful information on the health of the water bodies. Monitoring is popular, especially with high school biology and chemistry classes. Still, no one monitors 80,000 of Minnesota’s 92,000 river miles. Very few wetlands are monitored anywhere. The need is high.

## ACTION STEPS

### 1. Choose a Site

Are you interested in monitoring a nearby stream, pond, or wetland? First determine your goals in monitoring, how much money you have, what equipment, how much time you are willing to devote to your project, and what resource organizations are available in your area to help you reach your goals.

Typical goals of monitoring programs include:

- Build awareness,
- Establish a baseline of data, and
- Investigate a suspected problem or impact of a land use on a water body.

A site must be safely and legally accessible.

### 2. Types of Monitoring

There are several activities you can choose for your monitoring program, depending on your goals, your resources, and the time you can devote to the project. Every monitoring—from simple to complex—should include field reconnaissance (see pages 25-32), mapping, examination of aerial photographs or surveys to put results in context. Local agencies can say which tests they already do, and what additional tests interest them.

**Physical indicators** - Elements that describe the physical characteristics of a water body are: water flow or levels, channel conditions, riparian vegetation (what grows next to the water), soil types, and land use. This type of monitoring requires about one day’s training and little equipment.

**Biological indicators** - Bottom-dwelling insects (benthic macroinvertebrates) indicate water quality by their type, variety, and numbers. Certain species cannot tolerate poor conditions. Others thrive there. Collect samples with dip or kick nets, or place structures that insects will colonize. Samples can be sorted and identified using keys on site, or returned to the lab for more intensive analysis. Generally test at least twice a year on the same date, and at the same site and time. This type of monitoring requires at least two days’ of training, covering methods and analysis; equipment is less than \$1,000. Monitoring itself takes one half to one day, depending on the analysis performed.



**Chemical indicators** - The U.S. Clean Water Act and the Minnesota Pollution Control Agency suggest temperature, conductivity, turbidity, dissolved oxygen, nitrogen, phosphorus, and fecal coliform as indicators of whether water meets expectations for human contact and use. Samples should be collected monthly in open water season, and can be sampled easily using kits, or using analysis equipment in a lab. This type of monitoring requires at least two days' training, and up to \$6,000 in equipment (if lab analysis methods are used). Analysis will take about one day to complete.

### 3. Reporting and Quality Control

Minnesota Pollution Control Agency will accept data from students in River Watch program; others are interested in surveys and reports of observations. 7th grade students from Aitkin contribute data that is used by the state in its biennial water quality reports to Congress.

Reliable monitoring requires a substantial commitment. Participants must use forms, training, methods that are documented and can be replicated by others under similar circumstances. Monitoring programs should have a quality assurance program that demonstrates that results are accurate, comparable, and complete.

## WATER QUALITY MONITORING RESOURCES

- Rivers Council of Minnesota is a new statewide network of monitoring groups. Call to connect with technical assistance. Currently developing manuals and more. (Thanks to the Council for help with this section.) Rivers Council of Minnesota, 213 Summit Ave. E., Box 1107, Walker, MN 56484 (218) 547-3675 v. 547-3421 fax email: riversmn@eot.com
- Local Conservation Districts aid monitoring networks in some counties. (See inside back cover.) The Hennepin Conservation District offers a "Go to Key with Pictures for Macroinvertebrate Identification in Minnesota Streams." Contact Hennepin Conservation District, 10801 Wayzata Blvd., Ste. 240, Minnetonka, MN 55305 (612) 544-8572 v. 544-9437 fax email: hed@skypoint.com
- Save Our Streams offers publications, equipment, and training, specializing in biological monitoring and wetlands. Izaak Walton League of America, SOS, 707 Conservation Lane, Gaithersburg, MD 20878-2983 (800) BUG-IWLA email: sos@iwla.org Web: www.iwla.org
- Global Rivers Environmental Education Network offers publications, equipment, and extensive training. The Field Manual for Water Quality Monitoring is outstanding. Chapters on chemical and biological monitoring, data management, case studies, etc. ISBN 0-7872-3730-2. Call for catalogue. GREEN, 206 South Fifth Ave., Suite 150, Ann Arbor, MI 48104 (313) 761-8142 v. 761-4951 fax email: green@green.org Web: www.igc.apc.org/green
- The Terrene Institute catalogue is filled with the best-of-the-field publications, models, posters, etc. Especially recommended for biological monitoring: McCafferty's Aquatic Entomology, published by Jones & Bartlett, ISBN 0-86720-017-0 Terrene Institute, 4 Herbert St., Alexandria, VA 22305 (703) 548-5473 v. 661-1501 fax email: terrene@gnn.com Web: www.terrene.org

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## LAKE MONITORING RESOURCES

- Citizen Lake-Monitoring Program volunteers collect water transparency data throughout the summer using Secchi disks. Contact Jennifer Klang, Monitoring and Assessment Section, Water Quality Division, Minnesota Pollution Control Agency, 520 Lafayette Rd. North, St. Paul, MN 55155-4194 (612) 282-2618 or (800) 657-3864
- Many lakes have a lake property owners association. These organizations can be invaluable resources and allies in water quality protection projects. Contact one of the local offices of the organizations inside the back cover. Or contact your city for local names and phone numbers.

