Section 2:

Monitoring purpose, data uses and goals

This Section will show you how to:

- **Sort out the reasons you are monitoring.**
- **Think through who your primary data users may be.**

A successful monitoring effort requires up-front consideration of the why, who, what, when, where and how of monitoring – especially *why* you want to monitor, *what* you hope to accomplish and *who* you want to use the data. Often people involved in monitoring jump right into the "how" (i.e., the methods) before developing a clear monitoring plan that includes purpose, desired use of the data, etc. This Section covers the questions of why you want to monitor and who you want to use the data. *Section 4: Design Your Monitoring Program* covers how to combine all of these questions into a comprehensive monitoring plan.

Why are you monitoring?

You may have an idea of why you want to monitor. Perhaps you want to discover:

- What lives in the wetland near you.
- Whether the water in your stream or lake meets designated uses (such as fishing, swimming, drinking, aesthetics).
- Whether water quality is improving or diminishing.
- If swimming in the lake is a health risk.
- The impact land and water use activities are having on ecological conditions and human uses.
- If the various strategies in protecting and restoring ecological integrity and human uses have been effective.

Know what questions you want to answer

Taking time to think through the reasons you want to monitor will help you:

- Focus your project and collect the most useful information efficiently
- Select appropriate protocols and parameters
- Evaluate later if you have met your objectives and answered your questions
- Design a monitoring program that is credible to the primary data users

The first step is to make your monitoring project part of the bigger scientific picture by formulating your plans into a purpose. Your purpose may fall into one or more of the following categories:

- To promote community *education and awareness*
- To provide *water body characterization and assessment* (i.e., condition monitoring)
- To support *problem investigation* including regulatory investigation
- To evaluate the *effectiveness* of management decisions

For example, if you want to find out what lives in a wetland near you, your "purpose" could be "to promote awareness." Or if you want to find out if swimming in the lake is a health risk, your purpose may be "to provide data that can be used to characterize and assess" the lake in question.

Decide what questions you want to answer and what your purpose is. Clearly document them so you can revisit them later to see if you accomplished what you set out to do.

Square Lake gets remedial help

Monitoring efforts at Square Lake provide an example of the different monitoring purposes, and how monitoring purpose may change over time. While the Square Lake example includes all the purposes, your project does not need to cover them all. You can start with a single purpose in mind, and, like the example, the purpose may change.

Square Lake, in northeastern Washington County, is one of the clearest lakes in the state. Volunteers began collecting Secchi transparency readings on Square Lake through the MPCA's Citizen Lake Monitoring Program (CLMP) in the early 1970s. To broaden the lake's water quality database, the Metropolitan Council started routinely monitoring the lake in 1980, adding phosphorus, nitrogen, chlorophyll and plankton parameters to Secchi transparency readings. Since 1993, in-lake water quality data have been collected through the Metropolitan Council's Citizen-Assisted Monitoring Program (CAMP). In the mid-1990s, the lake association, in an effort to get some baseline loading data, began periodically collecting water quality samples from the lake's tributaries. Data collected through all the programs were used for baseline *water body characterization and assessmen*t.

Then trend analysis on the lake's historical (1970-2000) Secchi transparency database revealed a statistically significant decline in water clarity. Evaluating the lake's water quality database and listening to lake-user concerns that the lake was being degraded for recreational use led to increased *awareness* and the formation of a committee*. The committee submitted a proposal for a Clean Water Partnership (CWP) to conduct a more intensive in-lake and watershed-based study to *diagnose and investigate* potential problems, help set goals for desired in-lake conditions and protect the lake's exceptional water quality.

The results of this 1998 study have lead to remedial projects such as gully erosion control, road wetland rehabilitation, homeowner education, storm water runoff regulations, septic system surveys, and continued monitoring and evaluation. Volunteers continue to work with the Washington County SWCD, MPCA, MDNR and Met Council to further diagnose problems and assess the *effectiveness* of the implementation plan. Besides Secchi transparency and water samples, volunteers are currently collecting zooplankton samples to evaluate potential trends in the lake's *Daphnia* populations, as well as better understand the lake's predator-prey relationship between trout that are stocked in the lake and *Daphnia* numbers.

** Partnering in this volunteer-aided project were: Square Lake Association, Marine on St. Croix Watershed District, Washington Soil and Conservation District, May Township, Minnesota Pollution Control Agency, Metropolitan Council, Minnesota Department of Natural Resources, Science Museum's St. Croix Watershed Research Station, Wilder Nature Center, and Minnesota Chapter of Trout Unlimited.*

Who will use the data?

Whatever monitoring project you select, you will be generating some kind of data. That data can range from counting stream organisms to measuring chemical concentrations.

To make sure data will be usable for its intended purpose, identify in advance how you will use the data you collect.

Potential data users include:

- Monitoring program participants
- Students and teachers
- Watershed residents
- Local decision makers (e.g. cities and counties)
- Landowners and shoreline residents
- Environmental and business organizations
- Soil and Water Conservation Districts
- Watershed Management Organizations
- District, Regional, State and Federal Agencies
- Volunteer programs and organizations
- Nonprofit organizations

Programs have varying data requirements

Data quality and rigor that will ensure credibility varies with the use and the user. You may set up a volunteer monitoring program designed primarily to educate participants regarding the value of local surface waters. If your primary purpose is education and constituency-building, you may adopt simple, easy-to-use assessment methods and may not need to develop stringent quality assurance protocols. You might find that an interest in and understanding of monitoring and the resources being monitored increases over time.

Your program may attempt to identify actions you can take to protect or prevent damage to water resources. Or to help build scientific study skills by getting involved in data collection and analysis.

Any of these programs can assist in building bridges among various governmental agencies, businesses and organizations and create a constituency to protect local waters that promotes personal and community stewardship and cooperation.

Data for decision-making

If you want the data to be used for research, decision-making or regulatory programs, your data will have to meet data quality objectives set by those who will ultimately use the data.

Citizen phosphorus monitoring leads to change in local ordinance

Citizen water quality data on Pelican Lake, collected as part of the Pope County Coalition of Lakes Associations (COLA) water monitoring program, showed steady increases in phosphorus and decreases in water clarity over a four-year period.

The water quality was more degraded than most of the lakes in the region. Volunteer data was presented to the County Board to show the cause and effect between water quality and agricultural development in the watershed. The citizens requested mandatory inspections and upgrades on all feedlots in the Trappers Run watershed. The Board passed a resolution requiring inspections of the existing feedlots within two years and used the data to apply, and receive, federal 319 grant funding for upgrades along the creek such as buffer strips, dikes, and more to prevent further nutrient contributions from erosion and runoff.

Source: Minnesota Lakes Association

Learn what it takes to be credible

We strongly encourage you to contact primary data users and decision makers to determine what information they need. A good way to approach them is to ask them to review your monitoring plan (*Section 4* will show you how to build your monitoring plan). You may also decide to develop a Quality Assurance Project Plan (QAPP). A QAPP is a written document that outlines the procedures a monitoring project will use to ensure that the samples participants collect and analyze, the data they store and manage, and the reports they write are of high enough quality to meet the desired data uses. A QAPP is required for all U.S. Environmental Protection Agency (USEPA) funded monitoring programs and provides a tool for engaging the data users and defining credible protocols at the beginning of the project. *Section 3: Data quality*, provides additional information on developing a QAPP.

Some monitor for individual purposes

A farmer near Austin, MN is using a transparency tube just like the one these students are using to track the effectiveness of best management practices (BMPs) he is implementing on his land. Committed to land and environmental stewardship, this farmer is completing a series of wetland restorations and other BMPs to minimize erosion and flooding, and thereby improve water quality on (and coming from) his land. He uses transparency-tube measurements to track stream water clarity before and after the BMP installations and to help him decide where to place additional BMPs.

(Source: MPCA)

Directories for local decision makers and organizations

Some on-line directories include:

Board of Water and Soil Resources (BWSR): ***http://www.bwsr.state.mn.us/directories/index.html***
This site contains contact information for Watershed Districts, Watershed Management Organizations, County Local Water Planners, Wetland Conservation Act LGUs, and Soil and Water Conservation Districts

Minnesota Association of Watershed Districts (MAWD): ***http://www.mnwatershed.org*** This site contains contact information for Watershed Districts.

Minnesota Association of Conservation Districts: ***http://www.maswcd.org/SWCDs_On_The_Web/swcds_on_the_web.htm***.
This site contains links to Soil and Water Conservation Districts across the state.

A list of organizations involved in volunteer monitoring is also attached in *Appendix A*.