

CHAPTER 3

Getting Started

The Why – Goals and Objectives

So you've attended an IOWATER workshop and know how to gather, record, and report data about water quality. Now, how do you go about setting up and maintaining a water monitoring plan? Monitoring is a long-term commitment. To be successful requires forethought and planning. To do this, you need to ask yourself some searching questions. Your answers will determine your goals and objectives.

Why do you want to monitor water?

What do you plan to do with the information you gather?

Answers to these questions can help establish your overall goals. The major steps needed to accomplish your goal are your objectives. Objectives can be measured and are accomplished within a given time period. These should be carefully thought out, since they will determine the entire set up of your monitoring program.

The What – Monitoring Parameters

What do you want to monitor? Based on your goals and objectives, you now need to decide which water quality parameters you will include in your monitoring plan. The following chapters will describe the parameters the IOWATER program uses and the information each provides.

The IOWATER program chose these based on:

- The scientific value of assessments in the hands of citizen monitors
- The ease of doing tests in the field
- The low cost
- The safety of the methods

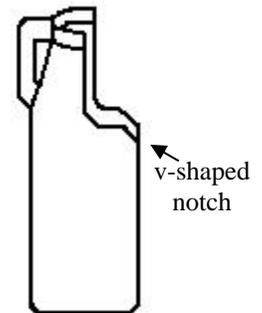
The Where – Monitoring Sites

Where are you going to monitor? Again, based on your goals and objectives, you will need to determine where you will monitor. If your goal is to preserve the health of your backyard stream, that's your monitoring site. If your goal is to compare two similar streams, find sites that are accessible and are located where you will not be trespassing. If you suspect a certain "source" is polluting your stream, you may need to set up monitoring sites upstream, at the "source," and downstream. If you need help determining where to sample, please contact an IOWATER staff member who may be able to offer suggestions.

Monitoring Site Selection Guidelines:

- Always adhere to the IOWATER Code of Ethics. Particularly, before monitoring on private land, obtain written permission and keep the landowner informed.

- Your monitoring site should be representative of your stream. In other words, do your best to locate a monitoring site that best represents the characteristics of your stream.
- If possible, establish your transect away from manmade structures such as bridges, which can provide 100% canopy cover all of the time and are not representative of the stream. If restricted to the right-of-way, however, monitoring at a bridge would be adequate.
- If monitoring at a bridge crossing, IOWATER recommends that you sample from the upstream side of the bridge. If safety issues and/or landowner considerations exist on the upstream side, err on the side of safety, respect private lands, and monitor on the downstream side of the bridge.
- Always monitor from the stream, if possible. If safety, weather, stream discharge, accessibility issues, time constraints, or other such conditions prevent you from obtaining water samples directly from the stream or lake itself, you may collect water samples using an IOWATER-approved sampling device.
 - *How to make a sample collection device.* Using a number two plastic jug (1/2 gallon milk jugs work great), cut from the opening down a few inches to the neck, then across and back up to the opening. Cut a v-shaped notch directly across from the handle. Tie a rope to the handle and your sampling device is complete.
 - To conduct the sampling with this device, please follow these steps:
 - Avoid contamination by not allowing the sampling device or rope to touch the ground.
 - Lower the sampling device down to the stream on the upstream side of the bridge. If there are safety concerns, sampling may occur on the downstream side, but it should be noted in the comments.
 - Partially fill the sampling device. If stream depth is adequate, you may need to bounce the sample device up and down a few times to allow water to enter. Be careful not to disturb the bottom sediments during this process.
 - Retrieve the sampling device, swish the water around, and empty it on the road behind you, not into the stream. Repeat this process a total of **3** times.
 - Fill the device a fourth time and begin monitoring. Refill as needed to complete all of the assessments. For directions on using the equipment, please refer to the appropriate chapters in this manual.
- Perennial streams may occasionally dry up (in exceptionally dry years), leaving little to no water or flow, and in some cases only pools of water. Likewise, intermittent streams may dry up every year yet retain enough water to maintain **perennially pooled conditions**. If your transect is dry, you can monitor the nearest pool (for chemical assessment) or all the pools in the stream reach (for biological assessment), but please note the conditions in the “Other Stream Assessments and Notes” section and take a photograph, if possible.



The When – Monitoring Frequency

When and how often are you going to monitor? Monitoring once represents a snapshot in time. To truly "know" a water body, you will need to monitor several times over the course of several years. Some things to consider:

- Time of year – Will you test all year or during a "season" (planting, fishing, summer when children are playing in the stream, etc.)?
- Frequency – Do you need to monitor weekly, monthly, quarterly, etc.?
- Time of day – You should try to monitor the same time each day, preferably mid-day, although this may vary. For example, the lowest dissolved oxygen levels occur at dawn. Therefore, if this is a concern, perhaps you need to sample early in the morning.
- Weather conditions – Rain can dramatically affect water quality. Perhaps you need this "snapshot" in time for your monitoring plan. On the other hand, rain causes increased **stream flow**, making monitoring physically dangerous. Never put yourself in danger to monitor water. Rather than monitoring immediately after a rain, monitor a day or so later, or sample from a bridge or stream bank for safety.

The Who – The Monitoring Team

Who will do what? People come to an IOWATER workshop with different ideas of their "**team.**" Some come to IOWATER as individuals or families, some as part of an established monitoring group, and some in hopes of starting a monitoring team.

Monitoring as an individual or family is fine, although there are some definite advantages to working as part of a larger group. Having more people involved increases the credibility of your data, lessens the monitoring load, is safer (IOWATER always recommends at least two people go out monitoring), and you'll have more fun!

Plan Examples

Goal: I want to monitor the creek behind my house to make sure it's safe for my children to play in it. I plan to watch the trends from my monitoring to see if my creek is getting worse, better, or staying the same. I'm also going to report my data to the IOWATER database to contribute to the health of the environment.

Objectives:

1. I plan to do a Habitat Assessment once a year in June.
2. I plan to do two Biological Assessments a year: once in May and once in August.
3. I plan to do a Physical/Chemical Assessment around the 1st of each month.
4. I'm going to watch trends in my data as I do the monitoring and graph my yearly data to compare it to the previous year's data. I'll do this sometime in October when things slow down around here a little bit.
5. I plan on entering my data into the IOWATER database right after each assessment.

Goal: I am concerned that some land use practices upstream of my favorite fishing spot on Jack Creek are hurting the fish population. I want to make sure the water quality remains high, and I plan to pay special attention to dissolved oxygen, which the fish need to survive. I plan to submit my data to the IOWATER database and report any unusually low dissolved oxygen levels to the local DNR Fisheries office and ask their advice.

Objectives:

1. I'm going to do a Habitat Assessment as soon as ice-out in the spring and again during the year if there is a major land use change upstream.
2. I'm going to do three Biological Assessments per year: one as soon as ice-out in the spring, one about mid-summer and one in the fall.
3. I plan to do a complete Chemical/Physical Assessment the same time I do the Biological Assessments. I also plan to test for dissolved oxygen about every time I go out fishing (which hopefully will be about once every two weeks).
4. I plan to submit all my data to the IOWATER database in the fall. If I have spare time during the "season," I'll be fishing!
5. I plan to graph my dissolved oxygen data with a few other parameters and see if I can see any trend in the data.

Goal: As a teacher, my goal is to educate students about the basic procedures used to gather information about water quality and compare two watersheds (the land area that drains to a water body). I plan to have the students analyze land use practices within the two watersheds and draw inferences about differences in water quality data from these analyses.

Objectives:

1. Locate two watersheds of different size, **topography**, and/or land use.
2. Locate monitoring sites along two similar streams within these watersheds.
3. Map land use in each of the two watersheds.
4. Conduct Habitat, Biological, and Chemical/Physical Assessments once in the fall and once in the spring of each year.
5. Enter data into a database and generate summary statistics and graphs of the data. This will be done the week following each monitoring session.
6. Have students input all data into the IOWATER database.
7. Work with our mass communications class to incorporate annual findings into a local news release.

Be sure to review and refine your program goals and objectives over time! A program can easily stagnate or even die if the original goals and objectives are met and new ones are not established.