
Module 15 Monitoring Ponds & Lakes

Introduction

This session will be held at a selected pond, lake, or reservoir site with local organizers and sponsors. Participants will participate in a two-hour, hands-on session that focuses on the key concepts presented the previous three days. In diverse groups of three to five individuals you will repeat self-selected aspects of the *Streamwalk* activity, share your skills, and learn new skills in this pond, lake, or reservoir monitoring exercise (biological pp. 257-275). In this session groups are asked to use water monitoring equipment and/or testing kits in order to apply what they learned in the *Streamwalk* activity to a different type of water body. This is an excellent time to try other types of water monitoring equipment, tests, or protocols that have not yet been practiced.

Please remember the safety considerations already presented and return all equipment in a clean and orderly condition. Groups are encouraged to compare and contrast what they learned in the stream vs. the lake, pond, or reservoir. Each group should complete selected physical, indicator, and biological monitoring activities and are encouraged to satisfy their curiosity by asking questions and testing ideas about the site that they are assigned.

In this module participants will: *Complete a pond, lake, or reservoir monitoring activity and compare and contrast their findings with the Streamwalk component of the short-course.*



Second Session — Lake, Pond, or Reservoir Segment

Having completed the *Streamwalk*, short-course participants can make a practical application of what they have learned about physical habitat assessment, the 9 water indicators, and/or bio-monitoring activity to a different type of water body.

Sampling and collecting data from lakes, ponds, or reservoirs is different from streams, but many of the monitoring skills learned in *Streamwalk* can be used. For the purpose of this module we will call the lake, pond, or reservoir being studied a water body. These types of water bodies have inlets and outlets, they store water for the purposes of watershed protection, to reduce flooding, for domestic use, for animal agriculture use, for irrigation, and for wildlife protection and/or production. In thinking about monitoring skills that have been learned, short-course participants are asked to synthesis this information and apply it to a new circumstance.

The following questions can stimulate reflection and discussion with task group members:

- What is similar and what is different about this physical habitat surrounding this water body to the stream we looked at?
- Where should sampling take place on this type of waterbody? Should random transects be made and how do we go about monitoring?
- Which of the 9 indicators (temperature, dissolved oxygen [DO], pH, BOD, fecal coliform, phosphates, nitrates, turbidity, and total solids) is most important for this waterbody.
- At what depth should this waterbody be measured? How about the sediments?

-
- What human impacts (wave action from water craft, leaking drain fields, sediment accumulation from harvesting trees or crops, etc.) must be considered in monitoring this waterbody?
 - What types of insects would you expect to find in this waterbody as compared to a stream...what can they tell us about water quality that is different from streams?

The activities surrounding waterbodies and this one short-course measurement provides only limited information — only a guess can be made about what is happening the rest of the time. Regular sampling and collecting of data will provide information that can help document changes in these water bodies. The most obvious changes in water quality are:

- changes in clarity of the water,
- changes in the abundance of algae,
- growth of aquatic plants, and
- reduced levels of dissolved oxygen in all or parts of the waterbody.

As a volunteer monitor you can collect information according to established protocols that will help address waterbody issues.

Take a look at the PondWatch data sheets presented on pages 168-170. Does this fit the waterbody that you are monitoring? For the purposes of this short-course participants are monitoring from the edge of a waterbody or from a dock or bridge. If an actual monitoring effort were planned other materials would be required. For example:

- Water craft (boat, canoe, raft, etc.)
- Personal flotation devices for each person on board.
- First aid kit
- Other equipment that may be required by state and local watercraft laws.

If time permits have each task group do a SECCHI depth measurement of the waterbody using the information on pages 179-183. Note: Do not wear sunglasses because they will give biased results.

Ponds, lakes, or reservoirs selected for demonstration monitoring were chosen because of their accessibility and convenience to your training site. Because waterbodies vary, use caution in directly applying all things you learn at this site to other waterbodies in your own area. Circumstances surrounding each waterbody are unique and should be approached as such.

When you are monitoring take in the entire picture of your site. Some groups so focus on the **doing** part of this activity that the **being** part of the shared learning experience gets lost in the shuffle. When we are relating pond, lake, or reservoir water quality to our environment each monitor will have an individual perspective. Collectively the group's perspective will more likely come closer to the actual circumstances that surround the waterbody being studied.

This activity can be concluded with a discussion of local lake, pond, or reservoir monitoring programs in your area. These may be conducted by schools, public interest groups, or private or public agencies. Short-course participants are encouraged to continue their training by exploring these opportunities.



Discussion Points

- ❖ What new vocabulary terms were introduced in the waterbody session when compared to the *Streamwalk* session?
- ❖ Which indicators of water quality were used in your study of this waterbody? What did you find out and where did you sample?
- ❖ What is the purpose of this waterbody and what evidence did you find to support or refute this information?
- ❖ Did your task group pick up garbage or waste when you did the physical assessment of the waterbody? Why or why not?



Major Points to Remember

- ❖ Be safe in your monitoring effort.
- ❖ Do the physical habitat assessment first, then do the surface water indicator testing that seems appropriate, and complete the waterbody study with a biomonitoring activity.
- ❖ Clean up your messes and return all equipment and resources. Remember to “Leave no trace!”



Journal and Evaluation

When you get home pull out your journal and review the notes you took. Think about what you have learned and how you will apply it. On the back of the last page make out a time line or calendar to reach your goals. This will take the issues you have studied to action for yourself, your family, and your community. If you have not already done so, use the journal to complete your post-test and return it to short-course organizers.



▶ *Links and References*

Anger, L. and S. Wildberger (1994) The Pondwater Tour: The hands-on test kit and mini-curriculum for exploring lakes, streams, and ponds, Code 5418, LaMotte Company, Chestertown, MD.

Citizen Lake Watch Program Guide (1988) Oregon Department of Environmental Quality, Salem, OR.

Mitchell, M. and W. Stapp (2000) Field Manual for Water Quality Monitoring: An Environmental Education Program for Schools, 12th Edition, Kendall/Hunt Publishing Co. Debuque, Iowa.

Project WET Curriculum and Activity Guide (1995) Western Regional Environmental Education Council, 4014 Chatham Lane, Houston, TX 77027.

Volunteer Stream Monitoring: A Methods Manual, United States Environmental Protection Agency, EPA 841-B-97-003, November 1997, Office of Water, 4503F, Washington D.C. <http://www.epa.gov/owow/monitoring/volunteer/stream/>

Volunteer Lake Monitoring, United States Environmental Protection Agency, EPA440-4-91-002, December 1991, Office of Water, 4503F, Washington D.C. <http://www.epa.gov/OWOW/monitoring/volunteer/lake/index.html>



▶ *Short-course Presenters*

The second portion of the field day is designed to amplify the “discovery learning” experience of short-course participants. Short-course developers found it helpful to check out the site before the start of the short-course. Such places as the outlet of the stream being studied into a lake, a fishing reservoir near a hunting and fishing club, a pond at an arboretum, and beaver ponds upstream from a stream study site were selected in the pilot. Collecting water samples on-site ahead of time, noting vegetation types, and understanding present use (livestock, recreation, watershed protection, etc.) also helped in facilitating the actual field day. The teaching site should have easy access for the type of learners in your group, preferably a rest area nearby and have all safety issues identified and hazards noted or flagged before tasks groups continue their studies.

This portion of the short-course should be profoundly informal and all participants urged to explore the waterbodies based upon what they have already learned. In most cases, demonstrations of equipment and tests for ponds, lakes, or reservoirs can be accommodated in response to questions from participants. Organizers should have a selection of testing equipment that task groups can use. In addition they must be willing and able to demonstrate how to use it.

During the pilots, ponds were walked around and physical assessments were made. Participants noted the similarities and differences between ponds and streams. Lakes were monitored at docks, on shorelines, and from bridges. During the short-course pilot, water trunks from the WSU Howard Hughes Loan program were opened and groups or

individuals conducted tests on questions that they were interested in addressing. Similarly bio-monitoring can take place based on observations and questions that emerge in each task group.

When groups have completed the physical waterbody assessment, they then can request equipment to measure surface water indicators or bio-monitor the site. When their curiosity is satisfied, send them home with a thanks and a smile! Most task groups complete the waterbody monitoring activity in just under two hours.