



a primer to site-level monitoring activities for volunteer coordinators

Water Quality

Water quality can critically impact wetland plant and animal communities. Even water quality changes invisible to the naked eye can result in far-reaching and irreversible impacts. Many water quality parameters influence wetland health. Those commonly monitored in lakes and streams include dissolved oxygen, temperature, water clarity and phosphorous. When any of these parameters falls outside of healthy ranges, they stress and undermine ecosystem health. So what are the healthy ranges for water quality parameters in a wetland? The short answer is – it depends.

Each wetland ecosystem is adapted to a unique water quality profile, created by a wetland's

hydrological features. While most aquatic ecosystems languish when pH levels rise above 8.2 or fall below 6.5, for example, cranberry plants, tamarack trees, orchids and other species adapted to living in bogs can thrive in pH levels as low as 4.5.

Because there is so much diversity in wetland water conditions, wetland water quality is both fascinatingly dynamic and extraordinarily difficult to measure and interpret, even for professional natural resource managers. Consequently, we do not recommend site-level volunteer groups monitor wetland waters. Below we will explain a little about why and offer an alternative.

..... About Water Quality Monitoring in Wetlands

Water quality monitoring in streams and lakes has become a well-established volunteer activity. But research has determined little about how water quality measurements can be collected and interpreted to provide meaningful data about wetlands. Consequently, we recommend volunteer groups conduct water quality monitoring only as a means of measuring the quality of water in streams or lakes associated with their wetland.

In the remainder of this section, we will explain some of the reasons why we do not encourage volunteers to monitor wetland water quality and introduce a couple of statewide programs you may want to join if you have a lake or stream in your wetland area.

First, because there is such a great deal of variation from one wetland to another, determining what measurements indicate healthy water quality conditions in any particular wetland is extremely

challenging. Water conditions in wetlands are about as diverse as personalities in people. Additionally, the most common wetlands in Wisconsin have saturated soils, but very little or no standing water.

Finally, wetland water quality conditions can be highly variable over short periods of time. Seasonal transitions, droughts, floods and time of day can change wetland water conditions rapidly. Dissolved oxygen levels, for example, tend to peak during the day when plants are photosynthesizing and plummet at night when photosynthesis has ended but respiration, decomposition and other oxygen-consuming activities continue. However, there may be a practical application for water quality monitoring in your wetland area if it includes a stream or lake.

If you would like to engage volunteers in monitoring water quality in a stream or lake in your wetland area, we recommend you join the Water



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Action Volunteers program (WAV) or Citizens Lake Monitoring Network (CLMN). Both were developed to facilitate volunteer water quality monitoring, with WAV focusing on monitoring in streams and CLMN on water quality monitoring in lakes. WAV facilitates water temperature, dissolved oxygen, flow and transparency monitoring. There are opportunities for more advanced monitoring once a group has had experience with basic WAV monitoring. The program also hosts a database where volunteer-collected data can be archived and used to support water quality-related educational initiatives and help establish baseline data. The data has also sometimes been used in Wisconsin Department of Natural Resources “state of the basin” reports. Similarly, CLMN facilitates volunteer monitoring of lakes for water clarity, phosphorus, chlorophyll, water temperature and dissolved oxygen. The information collected through CLMN is used in water quality reports sent to Congress every two years. And lake water clarity data collected through CLMN is also submitted to the Great American Secchi Dip-In, to contribute to data on lake water clarity nationwide.

The *Monitoring Your Wetland* series includes 9 sections:

- Introduction to Wetland Monitoring
- Birds
- Small Mammals
- Dragonflies & Damselflies (*Odonata*)
- Frogs and Toads (*Anurans*)
- Butterflies (*Lepidoptera*)
- Invasive Plants
- ▶ **Water Quality**
- Macroinvertebrates

Available online in pdf format at: wetlandmonitoring.uwex.edu

INFORMATIONAL RESOURCES

Water Action Volunteers

WAV is a statewide program for Wisconsin citizens who want to learn about and improve the quality of Wisconsin’s streams and rivers. The program is coordinated through a partnership between the Wisconsin Department of Natural Resources and the University of Wisconsin-Cooperative Extension. <http://watermonitoring.uwex.edu/wav>

Citizen Lake Monitoring Network

CLMN is a statewide program for citizens who want to learn about and improve Wisconsin’s lakes. The program is coordinated through a partnership between the Wisconsin Department of Natural Resources, University of Wisconsin-Extension Lakes and the Wisconsin Association of Lakes. <http://www.uwsp.edu/cnr/uwexlakes/CLMN>

Wisconsin Citizen-Based Water Monitoring Network

This network offers multiple opportunities for and levels of water quality monitoring in Wisconsin. The network’s Web site includes links to many monitoring programs in the state. <http://watermonitoring.uwex.edu>

March 2011

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Project funded through a DNR Citizen-Based Monitoring Partnership Program Grant with support from University of Wisconsin-Extension.

University of Wisconsin, U.S. Department of Agriculture and Wisconsin counties cooperating. An EEO/AA employer, University of Wisconsin Extension provides equal opportunities in employment and programming, including Title IX and American with Disabilities (ADA) requirements.

