

Appendix A

Resources

This Appendix describes surface water monitoring resources, programs and water education available through various organizations and websites. It is divided into three categories: government; nonprofit and local; and educational resources. Some resources may fit into more than one category, given the various programs offered. The list is not intended to be comprehensive.

Government resources

Vermont Water Quality Division

www.vtwaterquality.org

The goal of the Water Quality Division is to maintain and enhance the quality and quantity of Vermont's lakes, rivers and wetlands to support healthy ecosystems and appropriate public uses. The Division is made up of seven Sections: Bio-monitoring and Aquatic Studies, Hydrology, Lakes and Ponds, Planning, River Management, Stormwater and Wetlands. The Division offers funding for programs through grants and partnerships, as well as technical assistance and informational publications.

Vermont Lay Monitoring Program (LMP)

www.vtwaterquality.org/lakes/htmlp_imp.htm

The Vermont Lay Monitoring Program is a cooperative effort between the Vermont Department of Environmental Conservation's Water Quality Division and lake users (volunteers). The LMP was established in 1979 and continues today with the same goals of accumulating reliable baseline data on water quality for each lake and educating lake residents about lake protection and biology. Volunteers sample a lake weekly during the summer for water clarity (Secchi depth), chlorophyll-a concentration and total phosphorus. Long-term data generated by the LMP is used to describe and identify changes in lake water quality, make decisions regarding the use and protection of lakes, and develop solutions to problem water quality conditions.

United States Geological Survey (USGS)

<http://water.usgs.gov>

The USGS investigates the occurrence, quantity, quality, distribution and movement of surface and underground waters and disseminates the data to the public, state and local governments, public and private utilities and other federal agencies involved with managing water resources.

The USGS has collected various types of water resources data that generally fit into the broad categories of surface water and groundwater. Water quality data are available for both on a website that provides current and historical data (**<http://waterdata.usgs.gov/nwis>**). Data can be retrieved by category and by geographic area. For Vermont data, go to **<http://water.usgs.gov>** and select "Vermont" from the pull-down menu of states.

U.S. EPA Office of Wetlands, Oceans and Watersheds (OWOW)

www.epa.gov/owow

The Office of Wetlands, Oceans and Watersheds is responsible for carrying out EPA's mission of protecting human health and the environment as it relates to water resources. With a new five-year strategic plan initiated in 2004, some of the future goals of the OWOW are to reduce pollution in waters so that fish consumption will be safer; to restore polluted waters to allow swimming again; to restore polluted watersheds; and restore, protect and increase the number of wetlands.

OWOW provides numerous methodology manuals, databases and mapping programs, trainings, funding through grants, and support to volunteer monitors.

U.S. EPA National Directory of Volunteer Monitoring Programs

www.epa.gov/owow/monitoring/dir.html

This directory lists volunteer organizations around the country engaged in monitoring rivers, lakes, estuaries, beaches, wetlands, and groundwater, as well as surrounding lands. It is intended to serve as a living document that will grow and change with the continued flourishing of the volunteer monitoring movement nationwide.

U.S. EPA Watershed Assessment, Tracking, and Environmental Results (WATERS) Database

www.epa.gov/waters

WATERS is an integrated information system for the nation's surface waters that unites water quality information that was previously available only from several independent and unconnected databases. The water quality information accessible from this database addresses public concerns such as:

- ◆ How healthy is my watershed?
- ◆ Can I drink the water?
- ◆ Can I eat the fish?
- ◆ Is it safe to swim in the water?

WATERS includes a query tool and a GIS mapping component.

Natural Resources Conservation Service (NRCS)

www.vt.nrcs.usda.gov

The NRCS is a division of the U.S. Department of Agriculture that provides technical assistance to help private landowners with conserving their soil, water, and other natural resources. The NRCS mission is to provide leadership in a partnership effort to help people conserve, maintain, and improve our natural resources and environment.

United States Department of Agriculture (USDA), Cooperative State Research, Education and Extension Service (CSREES)

www.usawaterquality.org/newengland

CSREES is an agency within the U.S. Depart-

ment of Agriculture that was created by Congress in 1994 through the Department Reorganization Act. CSREES advances knowledge for agriculture, the environment, human health and well-being, and communities by supporting research, education and extension programs. CSREES doesn't perform actual research, education, and extension but rather helps fund it at the state and local level and provides program leadership in these areas.

Nonprofit and local resources

River Network

www.rivernetwork.org

River Network's mission is to help people understand, protect and restore rivers and their watersheds. River Network was founded in 1988 to provide support to the hundreds of grassroots organizations across the country that were working to conserve their local rivers. In 1999, the River Watch Network, formed in Vermont in 1987 to protect rivers through community involvement, merged with River Network. River Network programs help activists turn concern into information and action. River Network offers training and numerous resources for volunteer monitoring programs. They have a Vermont office located in Montpelier.

Lake Champlain Committee (LCC)

www.lakechamplaincommittee.org

The LCC was founded in 1963 and is dedicated to protecting the natural resources and beauty of Lake Champlain and its surrounding watershed. Through advocacy, education and scientific research, the LCC takes action towards a clean and accessible lake, sustainable land use and an ecosystem approach to lake management. Historic accomplishments include preventing Lake Champlain from being used as an international commercial shipping route, stenciling storm drains to reduce illegal dumping into Lake Champlain's tributaries and initiating international efforts to accelerate the schedule for lakewide phosphorus reductions.

Watershed and Lake Associations of Vermont

www.vtwaterquality.org/lakes/docs/lp_watershedprograms.pdf

Throughout Vermont, there are a number of citizen-led efforts toward watershed restoration, protection, and stewardship. Over the past several years, these groups have engaged in a wide

variety of activities, from river corridor assessments and restoration to land conservation and water quality monitoring. A directory of Vermont's watershed and lake associations is offered by the Water Quality Division. There is also a Federation of Vermont Lakes and Ponds, a statewide, volunteer-run group that helps organizations and agencies build a communications network in support of lake protection, restoration, and stewardship programs.

Save Our Streams (SOS)

www.iwla.org

SOS is a national watershed education and outreach program developed by the Izaak Walton League of America (IWLA) more than 30 years ago. Individuals and groups adopt a stream and agree to become its guardian for at least one year. Stream adopters check water quality, look for signs of trouble and take action to help resolve the problems. SOS can be used in the classroom or in youth and civic organizations. The IWLA put together an SOS kit that contains survey forms; macroinvertebrate identification cards; and lessons on water monitoring, watershed dynamics and land use planning. The SOS manual comes with PC-compatible software for managing water monitoring data.

North American Lake Management Society (NALMS)

www.nalms.org

NALMS' mission is "to forge partnerships among citizens, scientists, and professionals to foster the management and protection of lakes and reservoirs for today and tomorrow." They accomplish this mission by supporting the development, communication and use of excellent science and cutting-edge management as well as through citizen education and advocacy.

Society for Ecological Restoration International (SER)

www.ser.org

SER is a nonprofit organization of scientists, planners, administrators, ecological consultants, landscape architects, teachers, engineers, natural area managers, volunteers and others. Its mission is to "promote ecological restoration as a means of sustaining the diversity of life on Earth and re-establishing an ecologically healthy relationship between nature and culture."

Water Environment Federation (WEF)

www.wef.org

WEF was created more than 75 years ago to continually assess and study the quality of our global water environment by commissioning studies about the sources and causes of pollution, examining each new water treatment procedure and educating the general public and water quality professionals on new techniques and solutions. Water quality focus areas for WEF include: watershed management, wastewater, industrial wastewater and biosolids.

Vermont Association of Conservation Districts (VACD)

www.vacd.org

The VACD is a nonprofit organization whose mission is to help Vermont's 14 Conservation Districts carry out natural resource-oriented programs at the local level. Several of these organizations operate volunteer monitoring programs.

Vermont River Conservancy (VRC)

www.vermontriverconservancy.org

The VRC works with partners all over the state to protect and improve water quality and to protect the wildlife habitat, natural areas, and water lands (forests, wetlands, shores and beaches, parks, and farms) that Vermont communities enjoy. VRC does this by working creatively with landowners, towns and cities, state and federal agencies and businesses to bring money to the table to purchase water-related lands for conservation.

Vermont Institute of Natural Science (VINS)

www.vinsweb.org

VINS was established in 1972 protect Vermont's natural heritage through education and research designed to promote the active care of the environment. Today, VINS has four Vermont locations (Manchester, Quechee, Montpelier and Woodstock) and offers natural science programs, teacher workshops, and K-12 educational resources statewide. Some of their most notable programs include Environmental Learning for the Future (ELF) for elementary students and Environmental Citizenship (EC) for secondary students. EC offers a range of watershed education programs and will soon publish a river monitoring guide and a streambank restoration guide for schools, supported by a watershed education website.

New England Regional Monitoring Collaborative (NERMC)

www.umass.edu/tei/mwwp/nermc

NERMC coordinates the delivery of training and related services to volunteer watershed monitoring groups in New England. This collaborative improves the ability to be proactive in developing sampling and action strategies, prevent redundancies of effort, increase the level of expertise of volunteers and improve program quality and effectiveness. In addition, NERMC strives to increase the use of low cost and user-friendly watershed monitoring tools by making training and related services more accessible.

Education resources

Project WET (Water Education for Teachers)

www.vtwaterquality.org/lakes/htmlp_projectwet.htm

Project WET is an international, interdisciplinary water science and education program for formal and non-formal educators of K-12 students. Educators can obtain the basic K-12 activity guide focused upon all aspects of water, or other guides focused upon water quality, wetlands, water conservation and cultural attitudes about water. Project WET is designed to teach children reading, writing, math and other subjects by exploring water and water-related environmental issues.

Healthy Water, Healthy People

www.healthywater.org

Healthy Water, Healthy People was developed by Project WET as a specific educational guide for water quality monitoring. The program is designed to facilitate and promote awareness, knowledge, stewardship and understanding of water quality topics and issues and to make evident the interdependence between science education and the public. The program includes publications, testing kits, training and professional development, networking and support services for anyone interested in learning and teaching about contemporary water quality education topics.

Lake Champlain Basin Program (LCBP)

www.lcbp.org

The LCBP is a coordinated effort between federal (U.S. and Canada) and state (New York and Vermont) government agencies, as well as pri-

vate organizations and individuals to restore and protect Lake Champlain and its surrounding watershed for future generations. Their efforts are guided by the plan *Opportunities for Action: an Evolving Plan for the Lake Champlain Basin*, which identifies areas of concern and outlines priorities for action. The LCBP is involved in many activities including monitoring, outreach and education designed to improve water quality and reduce pollution in the Lake Champlain Basin.

UVM Watershed Alliance

www.uvm.edu/~watershd

The primary objective of the UVM Watershed Alliance is to increase awareness and knowledge of watershed issues in Vermont youth. The Watershed Alliance provides curriculum materials, equipment, and Watershed Educators to schools and youth groups participating in their program, as well as support and guidance for teachers in designing programs in which children learn about watersheds and related water issues.

Vermont Monitoring Cooperative (VMC)

<http://vmc.snr.uvm.edu>

VMC was initiated in 1990 as a state, university, and federal partnership. It is a collaborative organization in which scientists collect and pool information and data for the purpose of improving our understanding, protection, and management of Vermont's forested ecosystems. Participating cooperators from government, academic and private sectors conduct research projects on a variety of topics including forest health, air quality and meteorology, wildlife, aquatic systems and others. VMC helps make the data and results from these projects available to other scientists, educators, resource managers and the general public.

Global Rivers Environmental Education Network (GREEN)

www.green.org

GREEN is a program of Earth Force, which engages young people as active citizens who improve the environment and their communities now and in the future. GREEN provides tools for teachers to build exciting, hands-on science programs around watershed assessment and improvement projects. Resources include the innovative Protecting Our Watersheds curriculum, testing kits and online data entry and assessment tools.