

## Appendix A:

# Resources

This Appendix describes water monitoring resources and programs available through various websites. The list is not intended to be comprehensive.

Resources are broken down into four categories: volunteer monitoring programs, other monitoring programs, water education resources and professional organizations. Some resources could fit into multiple categories, given the various programs offered.

## Volunteer monitoring programs

These organizations provide monitoring through the use of volunteers.

### Cannon River Watershed Partnership (CRWP)

<http://www.crowp.net>

CRWP was founded in 1990 to protect the surface and groundwater resources and natural systems of the Cannon River Watershed, a 1,460-square-mile area covering parts of six counties in southeast Minnesota. CRWP is involved in outreach, monitoring and on-the-ground conservation projects. The CRWP began its citizen stream-monitoring program in 2000 and had 22 volunteer monitors involved. Modeled after the MPCA program, the organization recruited a network of citizen volunteers to perform basic water quality testing throughout the watershed. This network will provide long-term water quality data for many parts of the watershed that were previously untested. Water quality and stream flow at several sites on the Straight River will be used in a Total Maximum Daily Load (TMDL) project for the Straight River in an effort to reduce bacteria pollution levels in the Straight and the Cannon Rivers.

### COLA Lake Monitoring Program

MPCA, Detroit Lakes Regional Office, 218-846-0747

The COLA Lake Monitoring Program was initiated in 1993 by the Becker County Coalition of Lake Associations. It is a citizen volunteer lake monitoring program that was drafted and developed by the MPCA – Detroit Lakes Regional

Office. The program was developed to collect reliable total phosphorus and chlorophyll-*a* data in conjunction with the MPCA - Citizen Lake-Monitoring Program Secchi data, to better understand the trophic condition of regional lakes. The cooperative program links county resource officials, coalitions of lake associations (COLAs), lake associations and the MPCA for lake water quality assessment goals. Citizen volunteers are trained to collect, preserve, and ship samples to a certified contract laboratory. Eight counties have implemented the program with over 250 lakes involved. Cooperators gain an improved understanding of the participating lakes and of general limnological principles. Resource managers have current information for management decisions and have built strong relationships with the COLAs and lake associations. Lake residents have developed an understanding about the phosphorus - chlorophyll - Secchi relationship and pass this information to others on the lake and within the watershed. Lake stewardship concepts and programs have an increased level of importance when residents understand the fertility level of their lake and how their shoreland activities affect lake nutrient levels. The user-friendly program has successfully generated credible data in each of the counties where implemented. The data are used for 303(d) water quality assessment purposes.

### Metropolitan Council

<http://www.metrocouncil.org>

The Metropolitan Council is the regional planning agency serving the Twin Cities seven-county metropolitan area (TCMA). It provides essential services to the region, such as collects and treats wastewater, engages communities and the public in planning for future growth and provides forecasts of the region's population and household growth.

Noteworthy resources available:

#### ■ Lake Monitoring and CAMP

The Metropolitan Council has conducted water quality monitoring of the TCMA lakes since 1980. Both Metropolitan Council Environmental Services (MCES)

staff and citizen volunteers have been obtaining the monitoring data. The MCES Citizen-Assisted Monitoring Program (CAMP) has been very successful at involving citizens in lake monitoring efforts and greatly expanding the number of lakes with water quality data. Biweekly, each volunteer collects a surface water sample for laboratory analysis of total phosphorus (TP), total Kjeldahl nitrogen and chlorophyll-*a*, obtains a Secchi transparency measurement and provides some user perception information about the lake's physical and recreational condition.

Special lake monitoring is conducted on individual lakes to help answer specific questions.

#### ■ **Stream Monitoring.**

In 1973, MCES began monitoring the water quality of the Mississippi, Minnesota and St. Croix Rivers in the TCMA. These rivers are regularly monitored for a wide variety of water quality variables that help document long-term changes in water quality. This program led to the creation of the Stream Monitoring Program, which began in 1988. Twenty-six automated stream monitoring stations are now located around the TCMA and six stations in the Mankato area. These stations monitor portions of the Minnesota, St. Croix and Mississippi River Basins. Some of these stations are cooperatively operated between the MCES and local governments. The diverse range of variables analyzed allows for characterization of the streams that are being monitored and are leading to the development of target pollutant loads.

#### ■ **Wastewater Treatment Plant (WWTP) Monitoring.**

MCES monitors the quality of treated wastewater that is discharged from its eight wastewater treatment plants into the TCMA rivers. Groundwater monitoring is also conducted at several WWTPs.

### **Minnesota Department of Natural Resources (MDNR)**

<http://www.dnr.state.mn.us>

The MDNR's mission is to work with citizens to protect and manage the state's natural resources, to provide outdoor recreation opportunities and to provide for commercial uses of natural resources in a way that creates a sustainable quality of life.

Noteworthy resources available:

#### ■ **Lake Hydrology Program.**

Collects and provides data on lake levels and other characteristics that are needed to effectively carry out the DNR Water's statutory responsibilities and management programs. Includes the development and maintenance of the *Lake Level Minnesota* monitoring network and the Lakes-DB computer database. In the Lake Level Minnesota program, volunteers and cooperative organizations collect and report lake levels throughout the state. Each spring, DNR Waters employees travel throughout the state and reset the survey lake gages. These gages are used to measure the change in water levels throughout the open water season. A map of the locations is provided.

#### ■ **Project Wet.**

<http://www.dnr.state.mn.us/projectwet/index.html>

Project Wet (Water Education for Teachers) 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. It is designed to teach children reading, writing, math and other subjects by exploring water and water-related environmental issues. There is a WET curriculum guide.

#### ■ **Water on the Web.**

<http://wow.nrri.umn.edu/wow/>

Water on the Web's primary goal is to train students to understand and solve real-world environmental problems. WOW offers unique opportunities for high school and first-year college students to learn basic science through hands-on science activities (in the lab and in the field) and by working with state-of-the-art technologies accessible through a free web site. It is a collaboration of MDNR, the Natural Resources Research Institute, Minnesota Sea Grant, University of Minnesota Duluth, Lake Superior College and Apprise Technologies Inc.

#### ■ **Exotic Species Monitoring.**

<http://www.dnr.state.mn.us/volunteering/index.html>

There are a number of volunteer monitoring opportunities available for review on this website.

■ **State Climatology Office (SCO).**

<http://climate.umn.edu>

This office manages, analyzes and disseminates climate information to ensure a contiguous and continuous supply of high-quality climate data. It maintains a number of data sets and develops products from those data sets, such as: weekly maps of snow depth or precipitation, current and long-term summaries of floods, temperature and precipitation and other products resulting from high spatial resolution daily precipitation data sets and special data sets. The Office works with Soil and Water Conservation Districts, the National Weather Service, the Metropolitan Mosquito Control District, DNR Forestry, Watershed Districts and others to recruit volunteers, distribute monitoring equipment and forms, and assure that the data are delivered to the State Climatology Office. The office receives data from more than 1400 volunteer participation monitors each year.

**Minnesota Lakes Association (MLA)**

<http://www.mnlakes.org>

[lakes@mnlakes.org](mailto:lakes@mnlakes.org)

MLA is a nonprofit organization that promotes citizen stewardship of Minnesota's waters and influences public policy for water resource protection. MLA participates in water quality and lake-oriented studies and meetings, represents lakeshore property owners on government committees, prepares training and reference materials on lake management issues, publishes a bi-monthly newsletter and e-mail bulletin and assists lake associations and coalitions of lake associations around the state. MLA also represents the voice of lakeshore property owners across the state at the state legislature.

The MLA website contains a bibliography of more than 600 lake management resources, including the Sustainable Lakes Workbook for lake management planning. MLA is working in collaboration with the Rivers Council of Minnesota to design and implement a statewide citizen monitoring network to enhance volunteer education and training and provide resources for volunteer monitoring. It also publishes and promotes a Lake Ecology curriculum for 5th and 6th graders that is being widely used throughout Minnesota.

**Minnesota Pollution Control Agency (MPCA)**

<http://www.pca.state.mn.us>

The MPCA was created to protect Minnesota's environment through monitoring environmental quality and enforcing environmental regulations.

Noteworthy resources available:

■ **The Lake Water Quality Assessment Program.**

<http://www.pca.state.mn.us/water/lakequality.html>

This program assesses 2,235 lakes in Minnesota. The assessment was first required by the Federal Water Quality Act of 1987. The MPCA chooses to update the assessment each year. Lake quality assessment information is useful to anyone involved in lake management in Minnesota – from lakeshore owners to lake associations. It provides lake and water quality criteria.

■ **Citizen Lake-Monitoring Program (CLMP).**

Participants take weekly transparency measurement readings on lakes and record their perceptions of the physical appearance and recreational suitability of that lake during the summer months. The MPCA enters the participants' data into a database called STORET, the United State Environmental Protection Agency's (USEPA) national water quality data bank. CLMP data help teach citizen volunteers about water quality interactions in lakes and provides important information for assessing trends in the quality of Minnesota lakes.

■ **Citizen Stream-Monitoring Program (CSMP).**

The CSMP, which began in 1998, was designed to give Minnesotans the opportunity to become involved in a stream-monitoring program that provides data management and interpretation. The CSMP uses a collaborative approach to stream monitoring by partnering with citizen volunteers who live on or near a stream and who are interested in water quality. Sites are monitored weekly from April to September and an annual report is completed that summarizes data collected by volunteers statewide and is sent to volunteers and other interested parties.

■ **Environmental Data Access.**

<http://www.pca.state.mn.us/data/eda/index.html>

The goal of the Environmental Data Access project is to create an interactive, web-based system for retrieving environmental data and assessments. The system will be compatible with Geographic Information Systems

(GIS) so that monitoring data can be displayed geographically. A first iteration of the web-based system, focused on surface water monitoring data, is accessible on the MPCA's web site as of June 30, 2003. Future versions will include all environmental data, not just surface water.

#### ■ **Lake Assessment Program (LAP).**

A LAP is a cooperative study of a lake, involving MPCA staff and local citizens, such as a lake association or municipality. The MDNR and Soil and Water Conservation Districts also cooperate on many of the studies. LAP studies characterize a lake's condition and provide some basic information regarding the interaction of the lake and its watershed. A detailed individual report is written for each LAP project. These reports provide valuable information for the local group, the MPCA and others interested in protecting or improving the quality of the lake.

#### ■ **Regional and Trend Analysis.**

The MPCA began a monitoring effort in 1985 to better understand regional patterns in lake conditions. The monitoring was based upon an ecoregion framework developed by the EPA. Most of the work was carried out between 1985 and 1989. More recently, MPCA's monitoring has emphasized trend assessment. Typically, MPCA samples 30 to 50 lakes per year on three or four occasions during the summer months for the purpose of adding to its regional database or for trend assessment. Combining several years of data from CLMP with chemical and biological data provides a good basis for assessing trends. Individual case studies that attempt to explain observed trends in water quality are included as part of this database.

#### ■ **Clean Water Partnership Program and Clean Lakes Program.**

These programs provide matching grants to local units of government to protect and improve lakes, streams and groundwater that are affected by non-point source pollution. The monitoring conducted under the Clean Lakes and Clean Water Partnership projects provides a detailed characterization of in-lake water quality and information to develop a detailed nutrient and water budget for the lake. It also includes a comprehensive assessment of conditions in the lake's watershed.

#### ■ **Biological Monitoring Program.**

<http://www.pca.state.mn.us/water/biomonitoring>

The biological monitoring program is responsible for the biological assessment of streams, rivers and wetlands throughout Minnesota. Primary goals are to develop tools for assessment in the form of indexes of biotic integrity (IBIs), and then to apply those tools through condition monitoring, problem investigation monitoring and effectiveness monitoring.

### **Outdoor Corps**

<http://www.outdoor-corps.org>

The Outdoors Corps program trains students to meet environmental stewardship needs in the community. It trains them in the operation and management of a small business, with services, such as: water quality monitoring, aquatic plant identification and mapping, forest management services, living snow fence design and installation, wildlife surveys and management services and natural history interpretation services. In 2002, the Outdoor Corps provided water quality monitoring services for 10 lake associations. Monitoring services include monitoring for total phosphorus, chlorophyll-*a*, Secchi disk measurements, temperature, dissolved oxygen profiling, exotic species monitoring, algae community analyses and aquatic plant surveys. The Outdoor Corps is made possible through support by the University of Minnesota Extension Service and the Initiative Foundation.

### **Rivers Council of Minnesota (RCM)**

<http://www.riversmn.org>

RCM is a statewide nonprofit organization that works to help Minnesotans improve, protect and enjoy the state's 92,000 miles of rivers. RCM is committed to building a strong network of River Sentinels – people and organizations that monitor river health and take action to improve and protect the rivers. The three main program areas include: Resources for Rivers (developing tools and resources to support and empower River Sentinels to successfully understand, improve and protect Minnesota rivers); River Voices (building awareness of Minnesota rivers and river conservation through newsletters, website, and presentations); and River Sentinels Network (building and forging strong ties for taking action to improve and protect rivers). RCM works with both citizen groups and local governments to build successful, locally led programs.

## River Network

<http://www.riverwatch.org>

The River Network's mission is to help people understand, protect and restore rivers and their watersheds. The original concept of the River Network was to provide support to the hundreds of grassroots organizations (river guardians) across the country that are working to conserve their local rivers. In 1998, River Watch Network and River Network merged. River Watch provides river activists with tools to measure the health of their river and River Network's programs help activists turn concern and information into action.

Through River Watch, participants learn such things as whether their streams are clean and healthy and how to identify watershed problems and their sources. Through River Protection and Restoration Tools, River Watch helps people learn about techniques, programs and laws to protect and restore their rivers and watersheds. The River Source Information Center has an extensive reference library.

## River Watch programs

There are a number of River Watch programs around the state; some programs are not associated with the River Network program or the Izaak Walton League. Here are a few programs:

### St. Louis River Watch

<http://www.fdl.cc.mn.us/ei/rw/>

This program is a river monitoring program for high school students in northeastern Minnesota. The 10-year-old program currently includes 25 schools. It has started to develop a formal QA/QC plan, but for the most part the group's primary goal is youth education and stewardship.

### Red River Basin Monitoring Project

[wrg@gvtel.net](mailto:wrg@gvtel.net)

<http://www.ndsu.nodak.edu/tricollege/watershed/>

With the support of a Minnesota Board of Water and Soil Resources Challenge Grant, the project began in 1995 with four schools on the Sand Hill River. The program has grown to involve more than 30 schools monitoring more than 100 sites on waterways throughout northwest Minnesota. Monitoring sites are selected in consultation with local watershed district and soil and water conservation district managers to represent different reaches of rivers and tributaries. Schools conduct monthly monitoring of from three to seven sites – generally from April or May through October or November, inclusive of summer months.

## Mississippi Headwaters Board (MHB) River Watch

<http://www.mhbriverwatch.dst.mn.us>

The MHB was formed as an alternative to designation of the river into the National Wild and Scenic River system and works to protect and preserve the first 400 miles of the Mississippi River in Minnesota. It is a joint powers board of the counties of Clearwater, Beltrami, Cass, Itasca, Aitkin, Crow Wing and Morrison and works in conjunction with the Chippewa National Forest and Leech Lake Indian Reservation. It promotes water quality monitoring, education and stewardship activities. The River Watch program was started in 1989 and assesses the health of the Mississippi headwaters through nine indicators of chemical and physical tests.

### Sauk River Watershed District

<http://www.mnwatershed.org/sauk.htm>

The Sauk River Watershed District monitors 17 sites throughout the watershed district, from Osakis on the west to Cold Spring on the east and from Little Birch Lake on the north end to Eden Valley on the south side.

### Save Our Streams (SOS)

<http://www.izaakwaltonleague.org>

SOS is a national watershed education and outreach program developed by the Izaak Walton League (IWL) 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. It can be used in the classroom or in youth and civic organizations. The IWL put together an SOS kit that contains survey forms, macroinvertebrate identification cards and a teacher's manual on integrating SOS into the classroom and includes lessons on water monitoring, watershed dynamics and land use planning. The manual comes with IBM-compatible software for managing water monitoring data.

### Soil and water conservation districts (SWCDs)

<http://www.bwsr.state.mn.us> (Board of Soil and Water Resources)

<http://www.maswcd.org> (Minnesota Association of Soil and Watershed Districts)

Soil and water conservation districts are local units of government that help to manage and direct natural resource programs. They are based upon county lines; 91 soil and water conservation districts exist in the state. A board of five supervisors who are elected in the general state election governs each district. The districts work primarily on a



one-on-one basis with landowners and work closely with key partners, such as the Natural Resources Conservation Service and the University of Minnesota Extension Service. The soil and water conservation districts were authorized under Minnesota Statutes Chapter 103C. The Minnesota Association of Soil and Water Conservation Districts provides information on conservation issues, lobbying, policy development, coordination of training for district personnel, convention coordination and conservation education materials.

Each individual SWCD office is involved with monitoring in a variety of ways.

### **Volunteer Stream Monitoring Partnership (VSMP)**

<http://www.vsmpp.org>

VSMP works to support, strengthen and coordinate volunteer stream monitoring throughout the metropolitan area. VSMP offers programs monitoring chemistry, benthic macroinvertebrates, bacteria and physical habitat to assess the health of streams. VSMP has several resources to help volunteers get involved in monitoring at the appropriate level for their project goals, commitment and experience. Monitoring programs can be customized for educational purposes or to meet quality assurance/ quality control checks for data verification. VSMP works with local partners to support and promote volunteer monitoring by providing training; standardized protocols; quality assurance and quality control measures; data management, storage, and analysis; and a network of partners to assist in all types of monitoring.

### **Watershed districts**

<http://www.mnwatershed.org> (Minnesota Association of Watershed Districts)

<http://www.bwsr.state.mn.us> (Minnesota Board of Water and Soil Resources)

Watershed districts are local units of governments whose boundaries follow the natural watershed. A Board of Managers that is appointed by the applicable county board of commissioners governs Minnesota's 45 watershed districts. They receive their authority from Minnesota Statutes Chapter 103D. They are authorized to monitor surface waters, wetlands and groundwater; manage drainage systems; establish, record and maintain hydrological data; regulate, conserve and control the use of surface water within the district and other water resource activities. Watershed districts collect data on many lakes and streams within their boundaries. This data is generally available for use by

monitoring programs and is frequently shared with other agencies. Watershed districts use data from volunteer monitors to evaluate the need for further monitoring of certain areas. The website identifies watershed district locations. Watershed districts work in partnership with state, local and regional water planning and management activities. The Minnesota Association of Watershed Districts provides administrative, lobbying, convention coordination and district support services.

Many watershed districts have water monitoring programs.

## **Other monitoring programs**

Staff and other professionals conduct monitoring in these programs.

### **Center for Watershed Protection**

<http://www.cwp.org>

The Center for Watershed Protection provides local governments, activists and watershed organizations around a county in which it is located with technical tools for protecting streams, lakes and rivers. It has developed and disseminated a multi-disciplinary strategy to watershed protection that encompasses watershed planning, watershed restoration, storm water management, watershed research, better site design, education and outreach and watershed training.

Noteworthy resources available:

- **Urban/rural watershed in St. Mary's County in Maryland.**

Illustrated the use of a field stream assessment and current and future impervious cover as watershed planning tools.

- **Chesapeake Bay Region.**

Provides technical training to three watershed groups that focus upon protection and restoration skills, rapid stream assessment, delineating subwatersheds, GIS training, storm water retrofitting and watershed education.

- **Rapid Stream Assessment Technique (RSAT).**

RSAT allows for a simple, rapid reconnaissance-level assessment of stream quality conditions. The RSAT synthesizes USEPA, Izaak Walton League's Save Our Streams, USDA and CWP stream survey techniques.

## Land Stewardship Project (LSP)

<http://www.landstewardshipproject.org>

The LSP was founded in 1982 to foster an ethic of stewardship for farmland, to promote sustainable agriculture and to develop sustainable communities. LSP developed The Monitoring Toolbox with the Minnesota Institute for Sustainable Agriculture, along with its companion video, *Close to the Ground*. The project is known nationally for its unique integration of soil testing, water analysis, quality of life analysis and gauging of finances to create a well-rounded system for measuring the success of a farm. LSP also provides information on aquatic invertebrates, how to select a protocol and how to construct an invertebrate (invert) key.

## Minnesota Department of Agriculture (MDA)

<http://www.mda.state.mn.us>

The MDA is Minnesota's designated state lead agency for the enforcement of federal and state pesticide laws. As part of these responsibilities, the MDA monitors the state's surface and underground waters for the presence of pesticides and pesticide break-down products. Ground water monitoring at the MDA began in 1985 and surface water monitoring started in 1990. Annually in March, the results of pesticide water quality monitoring are published on the MDA web page. The state's pesticide water resources pesticide management plan is the responsibility of the MDA and includes the development, promotion and implementation of best management practices (BMPs) for the protection of the state's water resources. The MDA also collects information on the use of pesticides in the state.

## Water Resources Education

### Bridges

<http://www.bridges.state.mn.us>

This website provides direct access to state environmental information.

### Cairn and Associates

612-722-5806

Cairn and Associates educates the community through youth stewardship by organizing environmental service projects, storm drain stenciling, erosion prevention, etc. It designs community-based education on water quality, reduction and other issues and assists in creating community-based environmental grants programs.

Among the many resources available on the CGEE website

(see below), Cairn and Associates developed a list of "Curricula Supporting Water Quality Projects Aligned with Minnesota Graduation Standards" for primary and secondary grades. It analyzes the following resources: *Environmental Resource Guide\**, *Project WET*, *The Water Sourcebook\**, *Save Our Streams*, *Aquatic Project Wild and Full Option Science System\**. See the CGEE website (below) for more information.

## Center for Global Environmental Education (CGEE)

<http://www.cgee.hamline.edu>

CGEE provides training and educational resources for K-12 teachers and creates community education initiatives that motivate citizens for environmental leadership. CGEE, WaterShed Partners and Cairn & Associates collaborated on the website.

Noteworthy resources available:

### ■ The WaterShed Partners.

<http://cgee.hamline.edu/watershed/Exhibit/TheShed.htm>

A coalition of more than 40 public, private and non-profit organizations in the Twin Cities Metropolitan Area (TCMA) that collaborate on educational outreach. The WaterShed Partners created the WaterShed Exhibit. Its interactive exhibits provide learning opportunities about metropolitan watersheds and the impacts of individual actions. The *WaterShed* is available on loan for events.

### ■ WaterShed Action.

Many service-learning projects are outlined.

### ■ Water Quality Curricula.

Water quality curricula are identified for teachers. A list of curricula is included, such as: "Give Water a Hand," "Water on the Web," etc. There are specific resources identified for monitoring.

### ■ Pollution Prevention Project Guide.

Provides details of several pollution prevention projects including water quality monitoring. An overview of water quality monitoring topics is included such as: choosing a site, types of monitoring, reporting and quality control and lake monitoring resources. A Resource Directory is included.

### ■ Rivers of Life.

An interactive video program that provides projects and resources to help K-12 teachers and students learn about their watershed.

### ■ Waters to the Sea.

These media-rich explorations reveal how humans have changed the rivers of the Upper Mississippi watershed. Three virtual river journeys, led by historic guides, take viewers from prehistoric times up to the present through prairie, deciduous forest and coniferous forest ecoregions. Videos, QuickTime VR movies and engaging multimedia activities examine a variety of land-use themes in each watershed. Visits to a virtual water quality lab correlate land uses with water quality.

## Counties

<http://www.mncounties.org> (Association of Minnesota Counties)

<http://www.state.mn.us> (Minnesota North Star)

Many counties in the state have strong water resources programs. Some of them, such as Dakota County's Environmental Education program, are coordinated programs. Dakota County has specific information regarding wetland monitoring. See the websites for lists of counties and links to other sites. County water planners are good resources for water monitoring information.

Some counties have chosen to coordinate the management of water resources with other counties through programs and financing and have formed "joint powers boards," such as the Mississippi Headwaters Board (see Volunteer Monitoring Programs).

## Dakota County Environmental Education Program

<http://www.extension.umn.edu/county/dakota>

The Dakota County Environmental Education Program is a coordinated program between the Dakota County Soil and Watershed District, Office of Planning, Department of Environmental Management and the University of Minnesota Extension Service, Dakota County. The goal of the program is to promote consistent messages countywide about water resources protection. It sponsors the River Watch program in the Vermillion River and coordinates student monitoring of local lakes, streams and rivers.

## Fortin Consulting Inc.

763-478-3606

FCI's mission is to provide project design and coordination

that will unite citizens, environmental organizations and industry in the common goal of improving rivers, lakes and wetlands. FCI works with private individuals and companies, watershed management organizations, lake associations, schools and governmental agencies to provide environmental education, project management and implementation, surface water and wetland monitoring and landscape design and planting.

## Friends of the Minnesota Valley

952-888-0706

The Friends' mission is to support conservation and management of the natural and cultural resources of the Lower Minnesota River Watershed and promote environmental awareness. The Friends created the Minnesota River Watershed Initiative to develop an integrated, long-term sustainable communities conservation effort. They are collaborating with local, state and federal agencies, businesses, educators and community groups on this effort. The Friends work closely with the Minnesota Valley National Wildlife Refuge to accomplish their goals of stewardship, biological monitoring and education. Other programs include the Heritage Registry, Corporate Partners for Conservation and the Blufftop Bookshop.

## Friends of the Mississippi River (FMR)

<http://www.fmr.org>

Through active leadership and education, FMR seeks to preserve and restore the river's fish and wildlife, its vital floodplains and scenic bluffs and its natural and cultural treasures. FMR provides support for the Volunteer Stream Monitoring Partnership and the Shoreland Buffers Pilot Program. It developed a "Landscaping for Water Quality Workshop" for urban residents and conducts storm drain stenciling. With funding from the Metropolitan Council, FMR works with landowners along the Vermillion River to improve the quality of their riverfront land through the installation of vegetative buffers that reduce erosion and runoff, filter out nutrients and improve the health of the river.

## Minnesota Audubon

<http://www.audubon.org/chapter/mn/mn/wetlands.html>

Minnesota Audubon has three programs to protect wetlands: advocating for strong wetland laws, wetland and watershed restoration and neighborhood protection of wetlands. The American Rivers Project provides water quality education such as an in-stream flow restoration toolkit.



## Minnesota Board of Water and Soil Resources (BWSR)

<http://www.bwsr.state.mn.us>

BWSR is the state's administrative agency for 91 soil and water conservation districts, 43 watershed districts, 27 metropolitan watersheds and 80 county water management organizations. In partnership with the University of Minnesota Extension, BWSR supports local governments, conservation organizations and BWSR staff in:

- Developing education strategies that assist offices, agencies and organizations in reaching water and soil resources goals
- Designing and implementing education events
- Designing and producing educational materials
- Evaluating the effectiveness of educational efforts

## Minnesota Environmental Partnership (MEP)

<http://www.mepartnership.org>

MEP is a coalition of local and statewide nonprofit organizations. A list of all the partners is included on the website. "Healthy Waters," a multi-year commitment by MEP, includes a collaborative initiative to improve public policies, as well as education and outreach efforts. In 2002, MEP organizations successfully urged the State Legislature to pass the nation's first phosphorus-free lawn fertilizer law and assisted in the passage of legislation for developing a guidance manual and training for volunteer water monitoring.

## Minnesota North Star

<http://www.state.mn.us>

Official website of the State of Minnesota. Especially helpful for "Environment" and "Government" information.

## Minnesota Office of Environmental Assistance (MOEA)

<http://www.moea.state.mn.us>

MOEA is a non-regulatory agency that works to improve the environment through partnerships, technology transfer, technical assistance, education, research and matching grants.

Noteworthy resources available:

- **Green Print for Minnesota: The State Plan for Environmental Education.**  
Offers guidance to individuals, organizations and agencies that deliver or support environmental education in Minnesota.

## ■ Education Clearinghouse.

Provides curricula, training and listing of environmental books for students, including videos and other resources. Central location provides materials free or on loan. Provides an extensive library of videos, such as: Mississippi Headwaters River Watch (how to help monitor), *1997 Environmental Education Teacher Preparation Project* (implementation of environmental education in classrooms), *50 Simple Things Kids Can Do to Save the Earth* (Part 1: Water and Resources), etc.

## ■ Source Index.

Provides an extensive listing of resources locally and around the country.

## Natural Resources Conservation Service (NRCS)

<http://www.nrcs.usda.gov> and <http://www.mn.nrcs.usda.gov>

NRCS assists private landowners with conserving their soil, water and other natural resources and provides technical assistance to local, state and federal agencies. NRCS primarily works with local partnerships to help people conserve, maintain and improve natural resources and the environment and is a program of the United States Department of Agriculture. The Environmental Quality Incentives Program (EQIP) was established in the 1996 Farm Bill and provides technical, financial and educational assistance to farmers and ranchers who face serious threats to soil, water and related natural resources.

## Seek

<http://www.seek.state.mn.us>

Website provides a directory of environmental education resources.

## Water Laws

<http://www.waterlaws.com>

This is an interactive water resources journal of water law, policy and commentary that is sponsored by the Water Resources Group of Smith Parker P.L.L.P.

## Water Resources Center (WRC)

<http://wrc.coafes.umn.edu/index.html>

WRC is a multifaceted center with active programs in research, outreach and education. It coordinates volunteer programs that provide opportunities for citizens to learn about, monitor and restore local water bodies, such as Shoreland Volunteers.

Shoreland Volunteers serves as a resource to communities by answering questions about lakes and rivers, monitoring water quality and restoring shorelines. It leads community action projects and gets involved in local land-use decision-making.

### **Wetland Health Education Program (WHEP)**

[http://www.extension.umn.edu/county/dakota/](http://www.extension.umn.edu/county/dakota/Environment/wetlands/wetld.html)

[Environment/wetlands/wetld.html](http://www.mnwhep.org)

<http://www.mnwhep.org>

WHEP uses trained, volunteer “citizen biologists” to collect macroinvertebrate and vegetation measures from selected wetlands to measure the relative health of the wetland. Using an “index of biotic integrity” (IBI) developed by the MPCA, WHEP teams follow a simplified protocol used by professionals in the field. The IBI uses counts of macroinvertebrates (bugs, crustaceans, leeches, etc.) to come up with a single score. It relies on detecting critters or plants that are sensitive to pollution (or not) or an overabundance of pollution-tolerant species. WHEP is conducted in both Dakota and Hennepin counties.

### **University of Minnesota Extension Service**

<http://www.extension.umn.edu>

The University of Minnesota Extension Service offers a broad array of water quality programming and materials dealing with issues of water quality, safe drinking water, septic systems and the rehabilitation of the Minnesota River. The Extension Water Quality Program is an outreach arm of the Water Resources Center. The White Earth Reservation Science and Math Summer Program provide a natural resources curriculum that includes water quality monitoring.

### **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 water resources data at approximately 1.5 million sites across the United States, Puerto Rico and Guam. The types of data collected are varied but generally fit into the broad categories of surface water and groundwater. Water quality data are available for both. The NWISWeb provides current and historical data (<http://waterdata.usgs.gov/nwis>). Data can be retrieved by category and by geographic area.

## **Professional Organizations**

Following are some professional organizations for individuals within the water resources field:

### **North American Lake Management Society**

<http://www.nalms.org>

NALMS has a number of programs that are designed to improve the quality and management of lakes and reservoirs, such as “science and management” that presents research and management studies, peer review, public policy updates and initiatives, emerging lake issues identification and chapter grassroots advocacy.

### **Society for Ecological Restoration International (SER)**

<http://www.ser.org>

SER is a nonprofit organization of scientists, planners, administrators, ecological consultants, first peoples, 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)**

<http://www.wef.org>

<http://www.cswea.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. The regional chapter, The Central States Water Environment Federation (CSWEA) provides a Water Environment Federation (WEF) organization for Illinois, Minnesota and Wisconsin and offers multiple opportunities for the exchange of water quality knowledge and experiences among its members and the public.