

IOWA'S WATER

Ambient Monitoring Program

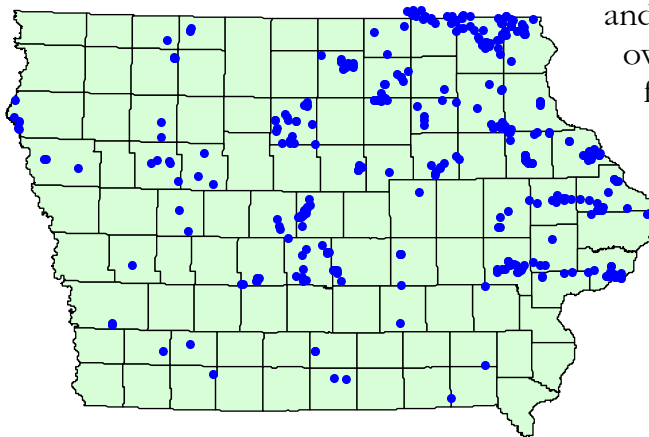
IOWATER Makes a Splash

As we enter the new millennium, water quality continues to be one of Iowa's top environmental concerns. The IOWATER volunteer water monitoring program was established in 1998 to help address this issue. As part of Iowa's ambient monitoring program, IOWATER provides an opportunity for citizens to take an active role in monitoring and protecting the quality of Iowa's waters.

While the State of Iowa has increased funding for professional water monitoring, most of Iowa's 72,000 miles of streams remain untested. More information is needed concerning many of Iowa's water resources. What is the condition of our streams, rivers and lakes? Is our water quality improving, staying the same or declining? With the help of trained citizen volunteers, useful information on the quality of Iowa's water can be acquired.

Volunteer monitoring in Iowa is not new. Many conservation and education groups have been monitoring for years. What is new is the statewide framework, providing valuable data and standardized testing procedures within the IOWATER program. This citizen-based program is directed by

the needs of local communities and individuals, allowing them to design their own monitoring plans. These plans will vary, from a fifth-grade class testing water once a year, to a conservation club testing several sites monthly, to a concerned farmer monitoring a stream adjoining his field.

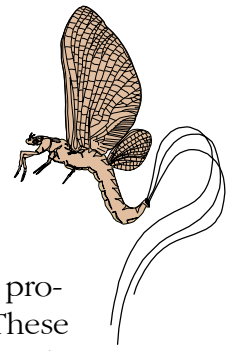


● IOWATER Monitoring Sites

Figure 1. Location of current IOWATER monitoring sites.



IOWATER Workshops



Level 1 Workshops. IOWATER's main focus is to provide training workshops scattered across the state. These workshops have a variety of sessions, in classrooms and in the stream, containing agenda items such as "Water Quality in Iowa," "Stream Assessment Techniques," and "Credibility and Communications." Monitoring techniques include:

1) Biological. "Benthic macroinvertebrates" (bottom-dwelling aquatic insects, snails, etc.) are used as indicators of stream health. Volunteers also assess plant and algae growth. **2) Chemical.** Although the chemical quality of streams fluctuates with season, time of day, weather and land use, this monitoring gives a "snapshot in time" of a stream's quality. Field kits are used to measure nitrate-N and nitrite-N, phosphate, pH and dissolved oxygen.

3) Physical. Stream measurements include water temperature, width, depth, velocity and water clarity. **4) Stream Habitat.** Assessing stream habitat is important in tracking

changes through time. Volunteers observe and record conditions of the streambed, stream banks, canopy cover, adjacent land use and the riparian (water's edge) ecosystem.

Monitoring strategies are discussed, but ultimately volunteers decide where to monitor, how often to monitor and what techniques to utilize based on the questions they are trying to answer. Upon completion of their first 10-hour workshop, participants are certified as Level 1 citizen monitors. A total of 524 volunteers were trained at eighteen Level 1 workshops in 2000. Thirteen Level 1 workshops will be held in 2001.



Level 2 Workshops. New in 2001 will be Level 2 training, for those trained at Level 1 with the interest and commitment to continue their training and efforts. This 8-hour workshop will have classroom sessions that provide specific help on designing a monitoring program and methods for interpreting the data collected. Stream sessions will include the monitoring of ammonia, chloride and *E. coli* bacteria (a type of fecal bacteria present in the intestinal tract of warm-blooded animals). Participants will be certified as Level 2 citizen monitors upon completion of Level 2 training and at least one Level 2 module.

Level 2 Modules. In addition to Level 2 training, three advanced, 4-hour training modules will be offered: **1) Benthic Macroinvertebrate Indexing.** Monitors will be trained to identify a wider variety of organisms, as well as count the number of organisms present. With this information, indices, or "metrics" can be calculated to better assess the condition of the stream. **2) Standing Waters.** This module will provide training to monitor lakes, ponds and wetlands. Many of



the tests used in Level 1 stream monitoring will be adapted for standing waters and some important components, such as aquatic plants and algae, will be added. **3) Soil Monitoring.** Soil quality monitoring will include information on infiltration rates, nitrate, stability of soil to wetting and crop residue assessment.

Level 3 Training. IOWATER will be expanded in 2002 to include Level 3 training. Methods and additional tests will be very site-specific, but have not yet been defined.

IOWATER Data: The Building of Credibility

The IOWATER Web site (www.iowater.net) has become an active resource for volunteers, environmental professionals and the people of Iowa. This site has workshop schedules, the IOWATER database, resources for volunteer monitors, links to volunteer monitoring programs in other states and the *Iowa Citizen Monitor*, the newsletter of IOWATER.

IOWATER's online database was developed for volunteers to register monitored sites, submit data they collect and access data being collected by others in Iowa. Only trained volunteers can submit data, however anyone can access the data. Water-quality data can be retrieved by site, county or watershed. Figure 1 (Page 1) shows the location of sites currently monitored.

Early comparison of the volunteer data to that being collected professionally shows a good match in overall trends.

There are similar ranges in concentrations for dissolved oxygen, pH, nitrate and temperature. These early results show that with the exception of current phosphate data, we can have confidence in the testing methods being used by citizen monitors. The phosphate test method will be changed for 2001. Testing methods used by the IOWATER program and the data collected by volunteer monitors will continue to be evaluated and changes to testing procedures will be made where necessary.

Benthic macroinvertebrates are used as indicators of stream health by water monitors. Pictured, from top: mayfly, water strider, riffle beetle, snail (not pouch), water penny beetle and predaceous diving beetle.

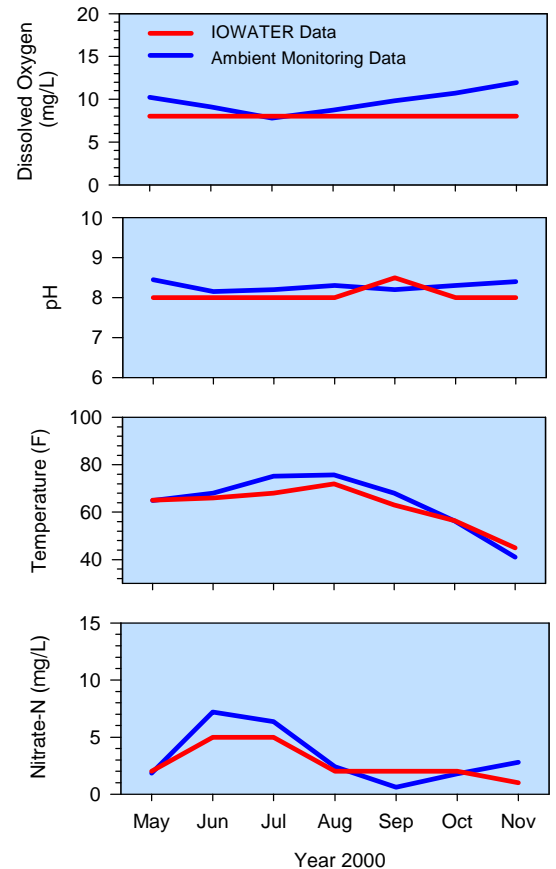


Figure 2. Comparison of citizen monitoring data to professional ambient monitoring data. Preliminary findings indicate a good match in overall trends, with similar testing results for dissolved oxygen, pH, temperature and nitrate concentrations. These graphs show average monthly concentrations.



IOWATER by the Numbers

- 524 – Citizens trained at IOWATER workshops in 2000
- 88 – Counties with IOWATER trained volunteers
- 370 – IOWATER sites registered
- 53 – Counties with IOWATER monitoring sites registered
- 1,026 – Data assessments submitted to IOWATER database
- 10,455 – Volunteer hours logged
- 125,289 – Fiscal dollar value of volunteer hours
(Excludes student volunteer hours)

Note: Above numbers calculated through 12/31/2000.

The Future of Citizen Monitoring

IOWATER will continue to educate the public about water quality and watersheds, in addition to assisting citizens in taking responsibility to monitor and protect their own waters. Plans for this next year include:

- Development of Level 3 procedures and workshops.
- Expanding ties to formal education programs in secondary schools, community colleges and universities across Iowa.
- Creating a Mini-Grants Program to assist citizens in their monitoring efforts.
- Incorporation of IOWATER in existing watershed efforts across Iowa.
- Developing urban stream monitoring programs. The city of Ames already plans to use IOWATER monitors on urban streams starting in spring of 2001.

IOWATER is a vital component of Iowa's new statewide water monitoring program. Citizens who participate in the monitoring process benefit the environment by becoming actively involved in local water quality issues and by assisting in restoration of Iowa's waters. IOWATER is here to stay, making "waves of difference" across Iowa!

IOWATER is an expanding statewide partnership including volunteer monitors, Area Education Agencies, Community Colleges of Iowa, Iowa Association of Naturalists, Iowa Conservation Education Council, Iowa Department of Agriculture and Land Stewardship, Iowa Department of Natural Resources, Iowa Environmental Council, Iowa Farm Bureau, Iowa Resource and Conservation Development, Iowa State University Extension, Iowa Student Environmental Coalition, Izaak Walton League, Natural Resources Conservation Service, Trees Forever and the University of Iowa Hygienic Laboratory.

Funding

Water monitoring activities of the Iowa Department of Natural Resources are funded by Iowa Infrastructure and State General Fund appropriations, as well as grants provided by the U.S. Environmental Protection Agency from Sections 106 and 319 of the Clean Water Act.



*Prepared by
Iowa Department of Natural Resources, Geological Survey Bureau
109 Troubridge Hall, Iowa City, IA 52242*

Photos by Clay Smith

*For more information, contact the IOWATER program:
Wallace Office Building, 502 East 9th St., Des Moines, IA 50319
(515)281-3252 (515)281-8895 (fax) www.iowater.net*