

IOWA'S WATER

Ambient Monitoring Program

Year 4 Accomplishments

Volunteer Monitoring

Citizens of Iowa continue to actively monitor Iowa's water resources, not only as participants in the IOWATER program, but by participating in a variety of new initiatives. One of the new efforts focused intensive water sampling on a specific area or watershed during a short period of time in order to compare water quality at many locations. These types of efforts represent a snapshot of water quality in time and help local officials and citizens to determine where targeting of future actions to improve water quality could best be implemented. Typically, snapshot sampling efforts are coordinated at the local level by interested volunteers (or local professionals) and in partnership with the water monitoring program, which provides technical support, training, laboratory analysis, and data management services. During the past year, hundreds of volunteers participated in 4 watershed, 10 county, and 2 statewide snapshot events, collecting water-quality information from more than 900 sites throughout Iowa.



IOWATER welcomes monitoring efforts from volunteers of all ages.

Another new program for citizens interested in the stewardship of Iowa's waters was Project AWARE (A Watershed Awareness and River Expedition). For one week in June, Project AWARE canoed the Maquoketa River from Backbone State Park to the Mississippi River on a river clean-up and water testing mission. More than 100 people participated in this first annual event sponsored by IOWATER and the Iowa Department of Natural Resources Keepers of the Land program. Despite the nearly constant rain, participants were gratified to see the growing mountain of tires, barrels, cans, bicycles, and trash pulled from the river.



Project AWARE participants removed garbage and tested water quality along the Maquoketa River.

Bacteria Monitoring

Bacteria monitoring at Iowa's state-owned beaches continues to garner public attention. During the fourth

year, beaches were sampled weekly from April through October for bacteria. This year, Iowa's water quality standard for recreational waters was changed from a fecal coliform bacterial indicator to *E. coli*, and a one-time sample maximum was added to the existing 30-day geometric mean standard. This change reflected guidance from the Environmental Protection Agency to the states on how to apply recreational standards. Beaches exceeding the one-time *E. coli* standard of 235 CFU/100 ml were resampled and those exceeding the geometric mean of 126 CFU/100 ml were posted with "Swimming Not Recommended" signs. Seven beaches with chronically high bacteria levels continue to be the focus of follow-up intensive watershed investigations to identify sources of bacteria.

While monitoring for fecal coliform and *E. coli* bacteria can identify where elevated bacteria levels occur, it does not identify the source(s) of those bacteria. To understand and control fecal contamination of Iowa's waters and to assess potential human health risks, it is necessary to identify the contamination source(s). As part of a pilot project in the Upper Iowa Watershed, DNA ribotyping, a bacteria source-tracking tool, was used to distinguish between various bacteria sources. *E. coli* bacteria were isolated from fecal samples collected from cattle, raccoon, deer, human, swine, and geese. These known isolates were used to create a database of DNA "fingerprints" that could be compared with *E. coli* of unknown origin surviving in the Upper Iowa River. By comparing these environmentally isolated bacteria to those included in the database, researchers were able to determine the types of animals that were contributing *E. coli* to the water throughout the year.

Biological Monitoring

This year represented the second of a five-year assessment on the biological health of Iowa's stream resources. The



Drilling of bedrock wells at Westfield Elementary School, Linn County.

random selection of 225 streams statewide will provide an objective measure of both biological integrity in flowing streams and habitat quality along stream banks. Data from this monitoring project will assess the number of stream miles that have impaired biological communities, the proportion of streams that are not meeting their designated aquatic stream uses, and proportion of streams that contain fish whose tissue exceed contaminant levels for human consumption.



Excess nutrients in Iowa's waters can lead to algal blooms during summer months.

Groundwater Monitoring

Monitoring of Iowa's groundwater resources continued with the annual sampling of 90 municipal wells located throughout the state. This year, sixty additional municipal wells were randomly selected from the Silurian-Devonian Aquifer system in order to gain a greater knowledge of the natural quality of this resource and highlight potential threats to this valuable drinking water source. Also as part of the groundwater program, a new well nest was completed at Westfield Elementary School in northern Linn County. Three wells were completed, at different depths, into the Silurian-

Devonian Aquifer to isolate specific groundwater layers for sampling and to better understand the quality of water from these units. These wells are located in an area where the Silurian-Devonian bedrock is near the surface and on the fringe of the rapidly developing Cedar Rapids metropolitan area.

While there is an existing monitoring system to track the quality of water in large municipal wells, limited information is available on drinking water quality in small rural Iowa communities served exclusively by private wells. The Iowa Community Private Well Study was a cooperative project of state, federal, and local agencies and included a one-time sampling of 103 randomly selected private wells in a total of 50 incorporated Iowa communities without municipal



IOWATER volunteers participate in snapshot samplings across Iowa.



water systems or rural water connections. The study examined the occurrence of a variety of parameters, the frequency water samples exceeded established health limits, and included a well construction and contaminant site survey.

Nutrient Study

Data from the ambient water monitoring program are being used in the development of Iowa's nutrient strategy. Nitrogen and phosphorus data from Iowa lakes and rivers have been used to assess the current status and historical trends in Iowa lakes and rivers relative to nutrients, and the impact of nutrients on these aquatic systems. Additionally, nutrient data collected from surface water throughout the state have been used in the development of a nutrient budget.

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Water Monitoring Program Web Site – wqm.igsb.uiowa.edu



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