



Applying knowledge to improve water quality

National Water Program

A Partnership of USDA CSREES
& Land Grant Colleges and Universities

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Enhancing Phosphorus Reduction Strategies in the Kalamazoo River Basin

GREAT LAKES
REGION



National Themes:

Watershed Management, Nutrient and Pesticide Management

Project Description

The Kalamazoo River has a legacy of serious industrial and nutrient pollution, and although pollution reduction efforts have greatly improved the river, serious water impairments and threats still exist. One major problem is nutrient enrichment of Lake Allegan, an impoundment located 21 river miles upstream from Lake Michigan. Previous studies identified phosphorus as the primary cause of lake eutrophication, leading to nuisance algal blooms, low dissolved oxygen levels, poor water clarity and an unbalanced fishery heavily dominated by carp. It is estimated that about one-third of the phosphorus comes from industrial and municipal discharges, and the remaining two-thirds from runoff, poorly functioning septic systems, livestock, pets and wildlife, and improper and illicit connections of sanitary discharges to storm sewers. The impoundment is on Michigan's 303(d) list of impaired waters. A large and diverse group of citizens came together during more than 100 public meetings to prepare a total maximum daily load (TMDL) and implementation plan. The TMDL sets phosphorus reduction targets of 23 percent for point source, and up to 50 percent for all nonpoint sources. The plan outlines desired phosphorus reduction goals and strategies in each of the following areas: point sources, agriculture, greenhouse nutrient management, turf management and alternative landscapes, municipal storm water, industrial storm water, on-site sanitation systems, in-lake and in-stream processes, transportation, construction sites and land use.

Project Goals

The project's goal is to reduce phosphorus loading to the Kalamazoo River watershed through stakeholder-driven research, education and facilitation. The overarching hypothesis driving this project is that effective environmental remediation occurs when decisions by stakeholders are science-based. Specifically, project staff seeks to:

- Understand phosphorus cycling (sources, transport, and pathways) in the Kalamazoo River watershed
- Improve the capacity of volunteer stream monitoring processes.
- Increase public understanding of TMDL goals and phosphorus sources, transport and pathways within the watershed, and enhance the capacity to implement phosphorus reduction practices
- Increase the effectiveness, capacity, and sustainability of stakeholder-driven phosphorus reduction efforts
- Disseminate the Kalamazoo River watershed Extension, research and facilitation model to other states within the North Central Region

PROJECT CONTACTS

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Actions

Project research efforts monitored three locations with auto-samplers and twelve through weekly grab samples over a three-year period from 2004-2006. Volunteer stream monitoring protocols were developed from research results and a monitoring team established. Education and awareness efforts were conducted throughout the watershed to increase awareness and phosphorus reduction practices.

Outcomes/Impacts

Research insights are playing a significant role to inform potential changes in phosphorus reduction strategies. Data indicate that in-stream impoundments contribute a substantial amount of the phosphorus to Lake Allegan. The role and policy implications of total phosphorus and total dissolved phosphorus relationships was an unexpected result that is gaining a lot of interest from regulatory agencies because of implications for BMP recommendations. In addition, project research validating use of transparency tubes as a surrogate measure of total phosphorus in portions of the basin offers new opportunities for cost effective, long term volunteer monitoring efforts.

Although the project is not yet complete, initial data indicate that total phosphorus load to the Lake Allegan inlet has been reduced 30 percent, with a nonpoint load reduction of 27 percent and point source load reduction of 35 percent, compared to 1998 levels.

The Kalamazoo River Watershed Council received a \$258,000 multi-year federal section 319 grant to develop a comprehensive watershed plan and associated informational systems. Although it is difficult to quantify project contribution to the successful grant application, the combination of a track record of basin-wide successes, a strong data set and research basis no doubt increased proposal competitiveness. The strategy to improve the positive identity of the river has focused on creation of the first ever watershed-wide Michigan Heritage Water Trail. The first leg of that trail (from Comstock to Lake Michigan) is expected to be completed, dedicated and opened by summer 2007.

Both developments will go a long way towards ensuring local sustainability for phosphorus reduction and overall restoration of the Kalamazoo River Watershed.



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