



State Innovation Grant Program

Massachusetts: Improving Water Quality through Watershed-based Solutions

The EPA State Innovation Grant Program was established in 2002 to help strengthen EPA's innovation partnerships with States and Tribes and is a direct result of the Agency's innovation strategy, *Innovating for Better Environmental Results: A Strategy to Guide the Next Generation of Innovation at EPA* (<http://www.epa.gov/innovation/strategy>). To support the *Innovation Strategy*, the 2002 grant program focused its efforts on projects that related to one of four priority issues: reducing greenhouse gases, reducing smog, improving water quality, and reducing the cost of drinking water or wastewater infrastructure. In addition, EPA sought projects that test incentives that motivate "beyond-compliance" environmental performance, or move whole sectors toward improved environmental performance. This series of fact sheets features the State projects selected for funding under the Grant Program.

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Background

Evaluations conducted by Massachusetts Department of Environmental Protection (MA DEP) and the Organization for the Assabet River (OAR) in 1998 and 1999 indicated that nutrients were negatively impacting water quality conditions in the Assabet River. Excessive nutrient concentrations contribute to algal blooms that hurt the river in two ways. First, they cloud the water and block sunlight, causing underwater grasses to die. Because these grasses provide food and shelter for aquatic creatures, spawning and nursery habitat is destroyed and waterfowl have less to eat. Second, when the algae die and decompose, oxygen is used up. Dissolved oxygen in the water is essential to most organisms living in the water, such as fish and crabs. This process is called eutrophication.

Human activities can cause or greatly accelerate eutrophication by increasing the rate at which nutrients and organic substances enter aquatic ecosystems from their surrounding watersheds. Agricultural runoff, urban runoff, sediment, leaking septic systems, sewage discharges, eroded streambanks, and similar sources can increase the flow of nutrients and organic substances into aquatic systems. These substances can overstimulate the growth of algae, creating conditions that interfere with the recreational use of lakes

and estuaries, as well as the health and diversity of indigenous fish, plant, and animal populations.

Because discharges from publicly owned treatment works (POTWs) in 1999 accounted for approximately 60-80% of the river flow during the summer months, MA DEP and the SuAsCo Watershed Team began a detailed analysis to document actual water quality conditions, evaluate what actions are needed to meet water quality standards, and to identify and assess both current and future wastewater and water supply needs in the affected communities. The studies showed that controlling only point sources such as sewage treatment plant effluent would not reduce nutrient loading enough to achieve water quality standards. MA DEP, a consortium of communities along the river, OAR, and a watershed team are exploring alternatives to meet water quality standards such as: dam removal, sediment control, groundwater recharge, and other nonpoint source controls as a complement to point source reductions.

Assabet River Watershed— Project Description

The parties began by conducting a detailed water quality sampling, including developing, calibrating, and validating a comprehensive water quality model, and evaluating different options for reducing phosphorous loadings. The model shows that while reducing phosphorous discharges from POTWs is critical, the contribution from sediment is also important. The project team jointly identified additional research and modeling activities to fully understand and evaluate the sediment issue. These additional activities include, but are not limited to: evaluating the chemical and physical characteristics of the sediment behind each dam, evaluating sediment transport and potential impacts to habitat, identifying the technical and legal issues associated with potential dam removal, and making additional model runs based on new data, once collected.

Innovation in Permitting: Based on the analysis of nutrient sources, the Assabet project seeks to create an innovative permitting process. This process would allow municipalities whose POTWs discharge to the river to adopt a strategy that enables them to choose


the nutrient reduction strategies likely to be the most effective at improving water quality. Potential activities include: reduction of nonpoint sources, removal of dams, removal and/or treatment of sediments, and potentially groundwater recharge of wastewater and/or storm water to impacted tributaries. Permit writing will likely begin in 2004.

Collaboration in the Assabet River Project:

Collaboration has been a key innovative component to the Assabet project. As the first project of its kind in Massachusetts, six Assabet River communities formed a watershed consortium. The Suasco Watershed Team which is comprised of environmental groups, municipal government, local business and industry, and Federal and State agencies came together to identify, prioritize, and address watershed issues. Once prioritized, a coordinated approach has been used to try to build a consensus on actions to be taken and to obtain the funds to achieve them. As a result, public input is included in all project components, which increases the effort's chance for success. The consortium approach helped leverage resources and document water and wastewater needs. It also obtained funding to evaluate future needs and to determine costs associated with various treatment and management alternatives. To date, this innovative approach has obtained and spent approximately \$650,000 in State-only funding for monitoring, modeling, and assessment activities and an additional \$3.5 million was awarded from the State Revolving Fund (SRF) for watershed and community evaluations.

Benefits of Assabet River Project

It is expected that these holistic watershed approaches will achieve water quality goals in a more cost-effective manner with full participation and buy-in from stakeholders. In addition, this approach will be transferable to other basins and other States—not in its specifics (e.g., the combination of dam removal, point source control, and sediment control), but in its structure, principles, and decision-making processes. It will provide a real-life example of a watershed approach to permitting that achieves real and measurable environmental results through innovative approaches.



This project offers a real-world application of watershed permitting that includes point, nonpoint, and innovative structural changes in one package that is enforceable and results-driven. The holistic approach not only helps achieve water quality goals, but also creates opportunities to address other watershed issues, such as diminished flow in the headwaters, and building a partnership of river advocates, dischargers, and local, State, and Federal levels of government.