Story by Courtney Swyden

# THE WAVE OF THE FUTURE

*Plans use local involvement to enhance water quality*

Comprehensive watershed protection plans, outlining ways to preserve or restore watersheds, are becoming a popular approach for protecting Texas surface waters.

The Texas Water Resources Institute (TWRI), Texas Agricultural Experiment Station and Texas Cooperative Extension are taking an active role in providing assessment, educational outreach, management and training to assist in the development of watershed protection plans across the state.

A watershed is a particular land area from which water drains into a common body of water. A watershed protection plan outlines ways to preserve a watershed or restore an impaired one. These plans are becoming more prevalent as populations grow and water quality concerns from point and nonpoint pollution sources increase.

According to the U.S. Environmental Protection Agency (EPA), using a watershed approach to restore impaired water bodies is beneficial because it addresses the problems in a holistic manner and stakeholders in the watershed are actively involved in selecting the management strategies implemented to solve the problems.

The EPA has established nine key elements that must be addressed in order to have a successful plan (see page 5).

"A successful watershed protection plan will use scientifically-based methods to identify sources of water quality impairments and develop estimates of the load reductions required to meet water quality standards," said TWRI Project Manager Clint Wolfe. A good plan should evaluate the costs and benefits of addressing these sources, develop effective management measures, identify potential funding sources to correct problems, and outline ways to track progress and water quality improvements once the plan is implemented, he said.

Linda Brookins of the Texas Commission on Environmental Quality (TCEQ) said watershed protection plans embody the "watershed approach" to restoring and protecting water quality. "They assess all the factors affecting a body of water, which are bounded by its watershed and develop a strategy for reducing the loading of pollutants to the degree required to meet water quality goals, including state water quality standards," she said.

The Texas State Soil and Water Conservation Board (TSSWCB) and TCEQ are heavily involved in watershed protection plans in Texas. TSSWCB focuses on agricultural and silvicultural sources of nonpoint source pollution, and TCEQ focuses on all other sources, but both agencies are involved in the plans.

"Our two agencies work closely with local stakeholders to develop watershed protection plans and later assist in implementation of these plans," Brookins, special assistant in the Office of Compliance and Enforcement, said.

Aaron Wendt, the TSSWCB's state watershed coordinator, said, "Watershed protection plans are really an avenue for local stakeholders to get involved and to get together to make decisions about their watershed."

With its capabilities of water quality modeling, economic analysis, education and outreach, monitoring and data collection, and plan development and training, Texas A&M Agriculture—through TWRI, the Experiment Station and Extension—is providing leadership in watershed management and developing protection plans, Wolfe said. These capabilities allow the groups to assist in all aspects of watershed protection planning from individual elements to total plan development.

TWRI is currently involved in watershed management projects in the Arroyo Colorado, five reservoirs in North Central Texas, Lake Granbury, Buck Creek and the Pecos River. It is working with agencies and local stakeholders to assess current issues in these watersheds and implement watershed protection plans. Most of these projects are in collaborative efforts with the Experiment Station, Extension,

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Lake Granbury, a critical water supply in North Central Texas, has recently experienced golden algae blooms and bacterial contamination. The Brazos River Authority is working with the Texas Commission on Environmental Quality, local entities and federal and state agencies to implement an integrated watershed protection plan.

TSSWCB, TCEQ, soil and water conservation districts, and local river authorities.

Wolfe, TWRI manager for the North Central Texas Water Quality Project, said, "A successful watershed protection plan for the project will be one that works to reduce sediment and nutrient loadings in the five water supply reservoirs managed by the Tarrant Regional Water District while accommodating a growing population and maintaining water quality."

TWRI, working with Texas A&M University Spatial Sciences Laboratory and engineering consulting firms, is using EPA-supported water quality models to estimate sediment and nutrient loading in the five reservoirs. The water quality models also predict the impacts of agricultural management and land uses on water quality. With federal funds from the USDA–Natural Resources Conservation Service (USDA–NRCS), TWRI and Extension are developing a water quality education program to help landowners, homeowners, businesses and municipalities reduce nonpoint source pollution.

After the Brazos River Authority detected high levels of bacteria in some areas of Lake Granbury, a critical water supply for 250,000 North Central Texas residents, the river authority solicited funds from TCEQ and EPA to work with local groups to develop a watershed protection plan for the lake. To assist in the effort, TWRI and Extension are developing a water quality education program to help local stakeholders and businesses reduce bacterial contamination from nonpoint sources of pollution. This effort is supported by federal funds from USDA-NRCS.

Water samples from Buck Creek in the Texas Panhandle, collected and analyzed by the Experiment Station through the Bacterial Monitoring for the Buck Creek Watershed Project, have confirmed elevated *Escherichia coli* bacteria levels. The next step is a watershed protection plan in cooperation with the TSSWCB, local soil and water conservation districts and other stakeholders, according to Kevin Wagner, TWRI manager for the project.

TWRI, the Experiment Station and Extension have also teamed with the TSSWCB and local conservation districts to assess the Pecos River Basin. The Pecos River, a tributary of the Rio Grande, and Lake Amistad have experienced increased salinity and dwindled flows because of irrigation demands, droughts, dams, invasive species and oil and gas production. The team is researching and monitoring water quality and quantity, educating rural and urban stakeholders and developing a watershed protection plan describing current and future management measures to protect the river's water quality.

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Five of the major reservoirs in the Trinity River Basin managed by Tarrant Regional Water District (TRWD) have problems of sediment and nutrient loading. TWRI and Texas A&M Agriculture are collaborating with TRWD to study water quality protection and improvement.

## What is a Watershed Protection Plan?

A watershed protection plan is a voluntary effort developed by local stakeholders that is formed from science-based information to protect unimpaired surface waters and to restore impaired surface waters. The following elements, established by the U.S. Environmental Protection Agency, are included in a Watershed Protection Plan:

- Identification of causes that need to be controlled to achieve load reductions
- Estimate of load reductions expected for management measures
- Description of management measures needed to achieve load reductions
- Estimate of technical and financial assistance needed to implement the plan
- Information/education component to enhance public understanding
- Implementation schedule for management measures
- Description of measurable milestones to determine implementation of management measures
- Set of criteria to determine whether load reductions are being achieved
- Water quality monitoring component to evaluate the plan effectiveness

Using funds from a TCEQ grant, TWRI is developing a course to train watershed coordinators and others interested in developing watershed protection plans. The Texas Watershed Planning Short Course is a collaborative effort between the EPA, TCEQ, TSSWCB, Extension and Texas River Systems Institute at Texas State University. The course will support the development of watershed protection plans and promote sustainable, proactive approaches to managing water quality throughout Texas.

"A well-coordinated watershed training approach is needed to provide the framework for focusing public- and private-sector efforts to address the highest-priority water quality impairments," Wolfe said.

The watershed planning course, a week-long event, will provide information on stakeholder coordination and in-depth analysis of EPA's nine plan elements and guidelines. The course will also include information about data collection and analysis; the tools available for plan development, education and outreach related to water quality; and the use of case study examples.

"Case studies will allow the participants to see how others are developing their plans as well as provide ongoing watershed planning efforts with valuable input from participants and national experts on the methods being used," Wagner said.

Other efforts in watershed protection planning within The Texas A&M University System include:

- Little Wichita River—Texas Institute for Applied Environmental Research
- Plum Creek—Texas Cooperative Extension
- Arroyo Colorado—Texas Sea Grant
- Dickinson Bayou—Texas Sea Grant
- Armand Bayou—Texas Sea Grant and Trust for Public Land

Collaborative partnerships, agency cooperation and technical support are all important in assessing water quality conditions to develop a successful watershed protection plan, Wolfe said. Stakeholder participation is key, so that in the end, they have a plan that can be implemented and has local support.

For more information on current projects, visit the Texas Water Resources Institute Web site at http://twri.tamu.edu.