

Applying knowledge to improve water quality



Southern

Regional Water Program

*A Partnership of USDA CSREES
& Land Grant Colleges and Universities*

Southern Region Water Quality Coordination Project

September 14, 2004 to June 1, 2005



Progress and Impact Report

A network of Land Grant University Extension and research personnel in the Southern region responding to water quality and conservation issues with educational assistance, technology development and technology transfer programs.



Southern Region Water Quality Coordination Project
Annual Report
Sept. 15, 2004 to present

The Southern Region Water Quality Coordination Project expands and strengthens an existing collaborative process through which new and existing technologies and management systems are developed and shared throughout the region and nation. Most importantly, it provides a means for channeling and leveraging technical and financial resources to more effectively address critical water quality and interrelated water quantity issues. The project utilizes an interdisciplinary, multi-state approach to develop and deliver watershed-based water quality and quantity research and education programs by targeting three key Focus Areas: *Agricultural Pollution Prevention*, *Rural Environmental Protection* and *Watershed Management*, which arose from strategic planning in 2003-2004. Program teams established within the Focus Areas work to implement regional activities. Regional coordination through the Southern Region Water Quality Planning Committee (SRWQPC) promotes the development and delivery of effective management systems that can be adapted for widespread application throughout the region and the nation. Primary emphasis is placed on providing leadership for water resources research, education and outreach to help people, industry and governments prevent and solve current and emerging water quality and quantity problems. Objectives and primary accomplishments of this project from September 15, 2004 to present are:

Objective 1: Support ongoing efforts of the regional coordinating committee to facilitate program planning and communication, define and prioritize research and educational needs, identify expertise of contributing institutions, facilitate resource sharing and technology transfer among institutions and with other federal and state agencies, organizations and stakeholders, and support the CSREES National Integrated Water Quality Program (NIWQP).

- Water Quality Coordinators provided leadership for multi-state and regional efforts to maximize sharing of resources and minimize duplication of effort.

The SRWQPC serves as the Regional Coordinating Committee and provides centralized coordination and networking both internally and with other regional water resources management programs, promotes technology development and exchange, and fosters collaborative, multi-state and multi-disciplinary efforts to more effectively and efficiently address common issues and concerns. The SRWQPC is composed of Water Quality Coordinators from 1862 and 1890 land grant institutions responsible for state-wide implementation of water quality research, education and extension programs.

The SRWQPC met three times during the reporting period. Regional quarterly meetings were held in Tunica, MS in October, 2004 and in Baton Rouge, LA in May, 2005. A regional meeting was also convened during the CSREES National Water Quality Conference in La Jolla, CA in February, 2005. In addition, the SRWQPC communicated frequently

through conference calls and list serv communications. SRWQPC water quality coordinators served as focus area leaders and program team chairs, and convened meetings and conference calls with program team members numerous times during the reporting period.

- The SRWQPC facilitated integration and linkages among research, education and extension programs at the county, university, state, regional and national levels.

The project utilized an interdisciplinary, multi-state approach to develop and deliver watershed-based water quality and quantity research and education programs, and targeted three key Focus Areas: *Agricultural Pollution Prevention*, *Rural Environmental Protection* and *Watershed Management*, which arose from strategic planning in 2003-2004. Regional coordination was accomplished particularly through Program Teams established within the three key Focus Areas, and promoted the development and delivery of effective management systems that were adapted for widespread application throughout the region. For examples, please refer to Objective 2 below.

- Water Quality Coordinators linked their programs to the Southern Region geo-referenced database at Texas A&M University.

Water Quality Coordinators identified and delivered research, education and extension materials such as reports on existing and on-going water resources research projects, water quality databases, university curricula, and extension educational resources and programs. For examples, please refer to Objectives 2 and 3 below.

- Implementation of work plans developed at the 1890-1862-1994 Water Quality Collaborative Conference held in July, 2004.

The Southern Region coordinated the 1890-1862-1994 Water Quality Collaborative Conference in July, 2004 in Atlanta, GA. The purpose of the Conference was to facilitate sharing of water quality resources and expertise; establish multi-institutional water quality work teams; improve collaboration and linkages among the 1890, 1994 and 1862 institutions; increase awareness of water quality work at 1890 and 1994 institutions; and strengthen linkages between USDA-CSREES, minority institutions and other agencies. Proceedings for the conference are posted to http://biosystems.okstate.edu/waterquality/events/Atlanta_2004/.

Work groups have begun implementing five action plans developed at the Conference. A sharp increase in attendance and participation at regional quarterly meetings in Tunica, MS and Baton Rouge, LA and at the National Water Quality Conference in La Jolla by water quality coordinators from 1890 institutions has occurred. Support through the Southern Region Water Quality Coordination Project has enabled collaboration with 1862s through program team projects. A Southern Region representative of the 1890 institutions was the primary author of a National Facilitation Project proposal submitted to CSREES and entitled, *Facilitation of 1890 Institutions' Water Resource Education, Extension and Research Efforts*. 1890 institutions are strongly interested in assisting and supporting development of the

CSREES-initiated database of water resource expertise at the 1890s and several have offered to host the database on servers at their campuses.

- 1890 Deans and Directors encouraged to designate a water quality coordinator at their institution.

Deans and Directors of the 1862 and 1890 land grant institutions in the 13 participating states have authority to appoint Water Quality Research, Education and Extension Coordinators (Water Quality Coordinators). Deans and Directors support the time commitments for Water Quality Coordinators to participate in quarterly meetings and other activities of the SRWQPC. However, at most of the thirteen 1890 institutions in the Southern Region, identification and designation of a water quality coordinator has not occurred, thus hampering involvement of 1890 water resource specialists in regional collaboration. 1890 and 1862 Southern Region Water Quality Coordination Project participants have initiated discussions with 1890 Deans and Directors regarding designating a water quality coordinator for their institution and it is anticipated that most 1890s in the region will designate a water quality coordinator in the next reporting year.

- Water Quality Coordinators implemented multi-partner efforts through direct coordination with Federal, state, and local water resource management agencies.

These included, but were not limited to, USDA-NRCS, USEPA, USGS, USDA-FSA, US F&WS, US COE, US DOE, university water resource institutes, state environmental agencies, local health departments, cities, growers associations, rural water associations, professional societies, and Soil & Water Conservation Districts. For specific examples, please see Objective 2 below.

- Regional Coordinators (elected for EPA Regions IV and VI) provided direct linkage between the SRWQPC and Federal programs and activities through coordination and program planning efforts with the Committee for Shared Leadership – Water Quality (CSL-WQ); participated in monthly conference calls; provided support for national citizenship efforts such as marketing, web site, and national conference; and represented the Southern Region at quarterly national coordination meetings in Washington, D.C., and other locations.

Region IV and Region VI Coordinators attended and participated in quarterly CSL meetings and served on CSL subcommittees. Information regarding CSL activities and initiatives was delivered by the Regional Coordinators to the SRWQPC. The Region VI Coordinator is leading the CSREES effort in a regional/national project partnership between CSREES and NRCS Headquarters investigating uniformity of LGU nutrient management recommendations. The Region VI Coordinator serves as the Program Chair for the annual CSREES National Water Quality Conference.

- The SRWQPC convened on a quarterly basis to conduct program planning and coordination activities, and communicated routinely via a regional list-serv and through regular teleconferences.

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- The SRWQPC engaged and supported Extension Liaisons with the Region IV and Region VI EPA offices in Atlanta and Dallas, respectively.

The SRWQPC continued support of the Liaison in Region IV and filled the Region VI Liaison position in Dallas, TX. The Liaisons provided direct linkage with EPA and other federal partners and also participated in multi-agency and multi-state collaborations to support the objectives of the Coordination Project.

- The SRWQPC planned and will conduct October, 2005 in Lexington, KY, a biennial regional water quality conference to facilitate regional program and resource sharing among institutions and other project partners, and to increase the capacity among county-based and state-level faculty for delivery of water quality research, education and outreach throughout the Southern Region.

The SRWQPC is planning and organizing its tenth, biennial, regional agent training conference. Conference sessions focus on sharing successful programs and innovative approaches to solving water quality problems in agriculture, home economics, community development, and 4-H. Pre- and post-conference workshops and technical tours offer opportunities for in-depth training on key issues while conference sessions present state-of-the-art strategies for addressing critical water resource issues facing the citizens of the Southern Region.

The overall goals of the Southern Region's Water Quality Conferences are to facilitate program and resource sharing among institutions and other project partners and to strengthen the capacity for Extension to develop and deliver water quality programs by sharing research information and successful education strategies and programs addressing current and potential water quality issues, and providing a forum for exchange of ideas and information. More than 200 County Extension Agents from across the southern region and from other regions are trained during each conference. Through regional coordination, expertise is

shared and duplication of effort in developing educational materials is avoided. The website for the upcoming conference to be held October 23-26, 2005 in Lexington, KY is www.ca.uky.edu/water. Proceedings and evaluation results for the previous conference held in Ruidoso, New Mexico in October, 2003 are posted to <http://srwqis.tamu.edu/srewq-conference.aspx>.

- The Southern Region, and specifically North Carolina State University, provided leadership in concert with the CSL-WQ for program planning and management for the annual CSREES National Integrated Water Quality Program Conference in support of the 406 Program.

The Region IV Coordinator chaired the organizing committee for the CSREES National Water Quality Conference. About 350 water quality professionals attended the conference featuring more than 240 oral and poster presentations integrating research, extension and education. Conference attendance has grown by more than 20% each year that the Region IV Coordinator has chaired the organizing committee.

This conference has become a premier event for scientists and educators interested in water resources to attend. 2005 Conference proceedings are posted to <http://www.idea.iastate.edu/waterconf/>. Planning is well underway for the 2006 conference to be held in San Antonio, TX, February 6-8.

- The Southern Region, and specifically Texas A&M University, in collaboration with the University of Idaho, provided leadership for marketing the CSREES National Integrated Water Quality Program. Marketing utilizes evaluation and impact information obtained through the national reporting database being developed at the University of Wisconsin.

A National Integrated Water Quality Program Impact Report was produced and distributed at the National Integrated Water Quality Conference February, 2005 in La Jolla, California. The Impact Report 1) provides key examples of how water quality professionals at universities and colleges, in cooperation with CSREES, are working with citizens, communities and partner agencies to address critical water quality problems across the United States, 2) describes the goals and structure of the NIWQP, and 3) provides contact information for national, regional, and state leaders. Each region's section reports their program framework and an abbreviated list of project impacts, and highlights an especially successful regional effort. Reports from the National Facilitation Projects; Integrated Research, Education and Extension Projects; and Extension Education Projects are included. A pdf version of the report is posted to <http://srwqis.tamu.edu/downloads/National.Impact.Report.3MB.pdf>.

The Southern Region updated and produced the CSREES NIWQP poster, trifold and Directory of Water Quality Coordinators. The NIWQP poster was displayed at the CSREES National Water Quality Conference in La Jolla, CA; the 1890, 1994 and 1862 Water Quality Collaborative Conference in Atlanta; the 4th National Conference on Science, Policy and the Environment: Water for a Sustainable and Secure Future, an EPA Region VI In-House Water

Quality Fair, a Volunteer Monitoring Conference and the Colorado Water Resources Conference. In addition, the poster was made available in pdf format through the 2005 National WQ Conference Proceedings link on the national website. A pdf of the NIWQP poster also is available on the national website's "About Us" page and on the Southern Region website at <http://srwqis.tamu.edu/posters.asp>. The Directory of Water Quality Coordinators was distributed at the National Water Quality Conference and through requests from program administrators and water quality coordinators. NIWQP trifold were distributed at a joint Extension-Experiment Station meeting in New Jersey and at an EPA Region VI In-House Water Quality Fair. The Southern Region has transitioned to the national reporting system at <http://www.uwex.edu/ces/regionalwaterquality/reporting.htm> by filing state and program team reports, in addition to regional reports to that database.

Objective 2: Develop and apply the best available science in water quality management through establishment and facilitation of Regional Program Teams under three Focus Areas. Focus Areas will coordinate the work of Program Teams to integrate research, education, and extension, sharing information and resources, minimizing duplication of effort, establishing partnerships, and leveraging multiple funding sources to address critical water quality issues.

The SRWQPC conducted a strategic planning process in 2003-2004 which identified priority Programs to address the most urgent water quality needs for agriculture and rural communities in the South. These Programs are grouped under three Focus Areas: *Agricultural Pollution Prevention, Rural Environmental Protection, and Watershed Management.*

Following identification of the priority programs in January, 2004, State Coordinators from 1862 and 1890 institutions identified the Programs of highest priority for their states to emphasize over the next four years. Multi-state, multi-disciplinary Program Teams were formed to develop action plans for the target Programs under the direction of Co-Team Leaders from 2 or 3 states. Co-Team Leaders include at least one State Coordinator along with other university faculty to ensure continuity with overall program objectives. Program Teams are charged with conducting regional level strategic planning with partner agencies and stakeholders to identify needs, accumulate research, education and outreach resources, and facilitate the implementation of coordinated regional and multi-state programs. Program Team accomplishments are reported under each Focus Area below.

FOCUS AREA 1: Agricultural Pollution Prevention: Agriculture is identified by EPA as the leading contributor of nonpoint source pollution in the nation. All states in the Southern Region are facing major issues related to nutrients, pesticides, sediment, pathogens, and waste originating from agricultural production activities. In addition, increasing demands on limited water supplies are further affecting the quality and availability of essential water resources. The SRWQPC identified 4 key Programs to target critical issues related to agricultural production: *Nutrient Management, Animal Waste Management, Irrigation Management, and Water Quality Education for Agricultural Producers.* Programs under this Focus Area address the following national water quality themes: animal waste management, nutrient and pesticide management, water conservation and agricultural water management, and water policy and economics.

Agricultural Pollution Prevention Focus Area

- The Nutrient Management Program Team coordinated a regional, multi-agency (NRCS, EPA, state regulatory agencies, 1890, 1862) planning conference, which produced a comprehensive summary of southern region states' nutrient management regulations, education and training resources, and P-indices.

State reports and the summary of Southern Region states' nutrient management regulations, education and training resources, and P-indices are posted at <http://srwqis.tamu.edu/program-nutrientmgmt.aspx>. The reports and summary are the result of a regional, multi-agency, nutrient management planning conference. Conference follow-up efforts include preparation of a regional comparison of P-indices journal article, regional rural/urban interface P loading assessment, survey of southern states regarding nutrient management planning changes due to P-index implementation, and regional assessment of soil test correlations/calibration needs for crop production and environmental management.

A joint information and planning meeting with industry (e.g., PPI, MC, Helena) is being linked with the Southern Plant Nutrient Conference in October, 2005. NRCS and EPA personnel are members of the Nutrient Management Program Team. The Region VI Coordinator and the nutrient management program team are leading the CSREES effort in a regional/national project partnership between CSREES and NRCS Headquarters investigating uniformity of LGU nutrient management recommendations.

- E-newsletters directed to the public and Extension agents have been developed by the nutrient management and animal waste program teams.

The e-newsletters will provide updates regarding research results and conclusions, and outreach products developed for these program areas. The current nutrient management e-newsletter is posted to <http://srwqis.tamu.edu/downloads/NMNewsletterApril2005.pdf> and the current animal waste management e-newsletter is posted to http://srwqis.tamu.edu/downloads/SAMWMO_2005-04.pdf.

- The nutrient management, animal waste management, irrigation water management, and water quality education for agricultural producers program teams are organizing regional capacity-building workshops and platform sessions to be delivered to Extension agents at the regional biennial conference to be held October 23-26, 2005 in Lexington, KY.

Information related to the upcoming regional conference is available at www.ca.uky.edu/water.

The Animal Waste Management program team will deliver a workshop entitled, "Management of Lagoons and Liquid Waste Storage Structures" at the Regional Water Quality Conference. Materials from this workshop will be posted to the program team website as regional outputs. A second workshop on Environmental Management Systems

also will be provided. In addition, three Animal Waste Management platform sessions titles will be offered at the Conference:

- 1) Alternative uses/off Farm Transport of Livestock and Poultry Wastes.
- 2) Implementation and Compliance with the EPA CAFO rules.
- 3) Mortality Management on Livestock and Poultry Farms.

- The Water Quality Education for Agricultural Producers Program Team is developing a regional curriculum template patterned after the *Master Farmer Program* introduced in Louisiana.

States must establish TMDLs for all waterbodies in the state according to the priority order and schedule of the 303(d) list. Voluntary implementation of economically achievable and effective BMPs represents a workable means of reducing agriculture's contribution and demonstrate that voluntary programs can address the concern for protecting our waters. The Master Farmer program is an effort to demonstrate that agricultural producers can voluntarily reduce the impact that agricultural production has on the environment while remaining economically viable through the adoption of research-based conservation practices. These environmental concerns, along with the need for agricultural producers to be more proficient in conservation to remain economically viable, have led to the development of a regional Master Farmer Program based on the successes of the Louisiana *Master Farmer Program*.

The Louisiana *Master Farmer Program* is implemented by the LSU AgCenter and partners with the Louisiana Farm Bureau Federation, NRCS, Louisiana Department of Environmental Quality, Louisiana Department of Natural Resources, National Oceanic and Atmospheric Administration, Louisiana Cattlemen's Association, and the Louisiana Department of Agriculture and Forestry. Regional, collaborative materials development and implementation are underway in LA, MS, AR, GA and TX. State coordinators have been hired in nearly every participating state. The Water Quality Education for Agricultural Producers Program Team met in Baton Rouge, May 2, 2005 to coordinate regional collaborative efforts. Louisiana is developing the template and a get-it-started manual. Mississippi is responsible for developing a preliminary interest level survey. Arkansas is developing a record-keeping and post-evaluation tool.

FOCUS AREA 2: Rural Environmental Protection: Rural communities throughout the South are facing many critical environmental issues related to drinking water supplies, waste management, and the challenges of land-use changes associated with urbanization. Drinking water issues range from domestic well safety and protection to source water protection for small water systems. Waste management issues range from on-site septic system maintenance to biosolids land application to solid waste collection and disposal. The encroachment of urban areas into agricultural/forested watersheds is intensifying land use planning and management concerns in many areas of the South. The SRWQPC identified 4 key Programs targeted to address concerns of rural communities: *Drinking Water and Human Health, On-site Wastewater Management, Community Wastewater and Solid Waste Management, and Rural/Urban Interface Landowner Education*. Programs under this Focus Area address the following national water quality themes: drinking water and human health and pollution prevention.

Rural Environmental Protection Focus Area

- Maintained and expanded the Drinking Water and Human Health FAQ Database at http://www.aces.edu/waterquality/faq/faq_03.htm, which provides answers to 1,996 questions on water-related topics.

Under the leadership of Auburn University, the Drinking Water and Human Health Program Team has maintained and continued to expand a [Drinking Water and Human Health Frequently Asked Questions \(FAQs\) database](#). There are 1,996 questions and answers arranged into 12 subtopics. Using this FAQ database, citizens and Extension county agents can learn how to deal with both health and nuisance issues in drinking water. This website and a web-based glossary of water-related terms also compiled by the Auburn University State Water Program have logged hundreds of thousands of hits and are by far the largest of their type available on the web.

- Producing a regional down-well camera video targeting private well assessment for groundwater protection.

A majority of rural residents in the Southern Region have their drinking water supplied by private water wells. It is critical these wells function properly and are free of pollutants. A down well camera was used to evaluate the condition of private drinking water wells and gain an understanding of groundwater impacts. The down well camera captures footage that allows a specialist to check a well's casing, depth of casing, presence of seepage at joints, and depth to water level that might lead to contamination. Images obtained with the camera identify problems and provide individuals with information necessary to encourage them to repair their well and remove the presence of any potential surface pollutants. The data and images collected from the camera allow Extension to better target the needs of private drinking water wells and develop educational programs.

In a year, the down well camera database has grown and trends are already apparent. For example, the relationship between old steel-cased wells and corrosive water had not been documented. The camera has been able to showcase that wells older than 40 years often have "pin holes" in the steel casing where corrosive water is located in an aquifer. This information and other trends are part of new Extension publications. The applied research obtained from the camera helps alert well owners with steel case wells to have them checked. Footage developed from wells videotaped in GA and KY (link through <http://srwqis.tamu.edu/program-drinkingwater.aspx>) is being used as the foundation of a regional DVD. Wells from across the southern region will be included in the regional DVD.

- The On-site Wastewater Management Program Team and the Drinking Water and Human Health Program Team are organizing regional capacity-building workshops to be offered to Extension agents at the regional biennial conference to be held October 23-26, 2005 in Lexington, KY.

Workshop titles will become available soon via the conference website at www.ca.uky.edu/water. Materials from the On-site Wastewater Management workshop will developed into a 5-6 page regional publication to be posted to the program team website.

FOCUS AREA 3: Watershed Management: Many watersheds in the South are threatened by changes in watershed hydrology and land use, resulting in impaired water quality and loss of habitat. Impacts include unsafe water supplies, degraded fisheries, eroding streambanks, reservoir siltation, impaired habitat, and loss of floodplain functions. Causes of watershed impairment include changing land uses, stream channelization, increasing sediment loads, poor land management, and loss of riparian vegetation. State and federal resource management agencies are now promoting a watershed approach to managing water quality. This involves assessing causes and sources of impairment, developing watershed management plans, encouraging local actions to protect and restore water quality, monitoring changes, and educating citizens to become watershed stewards. The SRWQPC identified 4 key Programs to address these issues: *Watershed Assessment*, *Nonpoint Education Network for Rural Community Decision-makers*, *Watershed Restoration*, and *the Watershed Education Network*. Programs under this Focus Area address the following national water quality themes: environmental restoration, pollution assessment and prevention, and watershed management.

Watershed Management Focus Area

- **Regional Watershed Academies for Water Resource Professionals were held in three locations in Alabama and North Carolina. Two more Academies are scheduled for 2005-2006.**

Watershed Academy participants learn how to apply water quality and watershed management principles to understand and solve complex water resource problems. Participants learn watershed basics, strategies of watershed planning and outreach, and watershed management solutions. Instructors use case studies, field trips, and group assignments to teach about water quality assessment and watershed management approaches, including conservation, protection, and restoration. Skills gained at the workshop improve students' ability to identify problems and solutions for their local watersheds.

The Watershed Academy is designed for Extension professionals, local government officials, local watershed coordinators, project managers, consultants, and agency representatives. Participants gain a thorough scientific understanding of watershed processes, assessment, and techniques for protecting and conserving water resources. Links to scheduled academies are provided through News and Upcoming Events at <http://www.aces.edu/waterquality/>. The regional watershed restoration webpage is <http://www.aces.edu/waterquality/sestreams.htm>.

- **Regional Watershed 4-H Camps held in TN; two more scheduled for 2005.**

The SRWQPC identified a need for focused, hands-on water quality education for younger 4-Hers. The objectives of the program were to: (1) Create a multi-state program in which youth learn the importance and value of water resources, (2) Enhance partnerships and collaboration between states and various agencies and organizations, (3) Develop and share a

camp manual, and (4) Promote the camp in other states and regions. A three-day, two night pilot resident camp was conducted at Land Between The Lakes, TN. 5th and 6th graders from Kentucky and Tennessee engaged in various activities related to key water concepts. Pre-and post tests and activity reports were used in evaluation. Partnerships included EPA Region IV's Watershed Education Network; Kentucky Water Resource Research Institute; U.S. Forest Service; University of Kentucky Cooperative Extension Service and Tracy Farmer Center for the Environment; and University of Tennessee Extension.

The project served as a means of educating youth about key water concepts, demonstrated a successful program that can be shared with other states and regions and also meshed numerous agencies and organizations in neighboring states. Changes in students' scores in regards to an attitudinal evaluation form given before and after the three-day program were significant at 0.10 value.

- Multi-state training workshop for Extension and Sea Grant professionals: *Examining Extension's Role in Local Citizen Watershed Action Groups*.

Clemson University in partnership with North Carolina State University, University of Georgia and Auburn University hosted a multi-state training workshop entitled, *Examining Extension's Role in Local Citizen Watershed Action Groups*, which had the following objectives: 1) Build capacity among Extension agents and specialists to organize new groups or mobilize existing watershed action groups to address issues of mutual concern, and 2) Broaden the use of watershed action groups by demonstrating the effectiveness of volunteers in addressing critical water quality issues. Participants included Cooperative Extension Agents and Specialists, Sea Grant Extension Personnel, and Watershed Partners.

- A Regional Master Watershed Steward Program, coordinated by Texas A&M and the University of Georgia, is being implemented.

Ultimately, successful management of a watershed and protection of its water resources depends upon engagement of the communities, businesses and individual citizens residing within that watershed. To achieve that engagement, watershed stakeholders must have a clear understanding of the forces which can adversely impact water resources and access to the knowledge and tools which can be employed to prevent and/or resolve them. The purpose of the Regional Master Watershed Steward Program is 1) to develop and deliver an educational curriculum which functions to increase local understanding of the forces which can adversely impact water resources and access to the knowledge and tools which can be employed to prevent and/or resolve them, and 2) facilitate establishment and support of local watershed action groups through the development of citizen Master Watershed Stewards. Increased understanding and promotion of appropriate BMPs and other restoration activities will be accomplished through education outreach and technology transfer via the Master Watershed Steward Program. Multi-disciplinary and multi-agency teams are being assembled to support watershed education resource materials development.

Master Watershed Steward Partners include state natural resource agencies, the Land Grant Universities, Cooperative Extension Services, Water Resource Institutes, Sea Grant Programs and EPA. Watershed Steward Coordinators at Texas A&M University and the University of Georgia are working jointly to develop curricula, evaluation tools, and websites, and to further leverage 406 funding. To date, the Southern Region Water Quality Coordination Project award has leveraged \$358,000 in funding from other sources.

- The Watershed Education Network, Nonpoint Education Network for Rural Community Decision Makers, Community Wastewater and Solid Waste Management, and Rural/Urban Interface Landowner Education Program Teams are organizing regional capacity-building workshops to be offered to Extension agents at the regional biennial conference to be held October 23-26, 2005 in Lexington, KY.

Workshop titles will become available soon via the conference website at www.ca.uky.edu/water.

- North Carolina State and Auburn Universities led Stream Restoration Workshops for agents and water professionals. Two additional stream restoration workshops are scheduled for 2005-2006.

Two regional Stream Restoration Workshops covering design principles for stream restoration using natural channel design were held. Participants gained an understanding of steps needed to complete a natural channel design. Principles and techniques discussed included the four priority levels of restoring incised streams, reference reach stream analyses, and techniques for finding and analyzing reference reaches. An introduction to the natural channel design process was also taught, utilizing local stream restoration projects. The workshops were split between classroom and extensive field work, including project/data summaries completed during evening work sessions. Field techniques for stream condition assessment and the Rosgen classification system were covered in detail.

Objective 3: Maintain and expand the watershed-based, geo-referenced, central database management system to serve as the repository for regional water quality information and resources, provide direct linkages to other regional and national database systems, and conduct coordinated needs and impact assessments regarding regional issues and programs.

To facilitate the accumulation, organization and delivery of resources and information, a web-based interface has been developed at Texas A&M University (<http://srwqis.tamu.edu>). This interface provides a direct link to other pertinent GIS/geo-referenced information systems across the region, links and communicates with water quality programs at the watershed and regional levels, and promotes regional and national awareness and coordination in the development and delivery of water resource management programs. Specific emphasis is placed on creating and expanding linkages within and among land grant university research, education and extension

programs and external partners throughout the region. The primary action items achieved and outputs provided under this objective are:

- Maintained and enhanced the Southern Region Water Quality Information System (<http://srwqis.tamu.edu/>) to manage information and resources identified and developed by states and Program Teams.

The Southern Region Water Quality Information Database was refreshed with an updated look and format, and new pages were added to accommodate the Project's new focus area and program team structure. Program team pages (e.g., the Nutrient Management Program Team page at <http://srwqis.tamu.edu/program-nutrientmgmt.aspx>) feature teams' objectives, plans for accomplishments, products, upcoming events and working documents such as meeting or conference call minutes. Program team members may be contacted through a regional email system at <http://srwqis.tamu.edu/focusareas.aspx>. This system is available for public use by anyone registering with the system and also is used for communication within the Southern Region. A calendar of events also has been provided.

The Southern Region Water Quality Information Database also includes a highly-effective Search University Publications feature at <http://srwqissearch.tamu.edu/search.aspx>, which provides a state-of-the-art search engine that examines thousands of science-based, water resource management publications in 65 databases maintained at universities throughout the Southern Region. All returns are highly relevant and provide objective water resource management information. This tool saves the SRWQPC many dollars and staff hours which would have been spent in assembling a region-wide publications library and is used by specialists and county agents to quickly direct clientele to a variety of publications developed across the region addressing their concerns. This powerful tool, produced through collaboration of the Southern Region Water Quality Planning Committee, is a regional product which promotes the Coordination Project's goals of enhancing regional information sharing and resource exchange, increasing regional collaboration, facilitating delivery of land grant university resources and reducing duplication of effort.

- Maintained and enhanced the interactive, web-based GIS tools and data layers available through the Southern Region Water Quality Information Database.

The Southern Region Water Quality Information Database offers unique GIS mapping and analytic capabilities. Two levels of access to data layers are provided. HTML-access users are able to select from a menu of data layers providing information such as watersheds, impaired water bodies, soil type, land use, hydrology, roads, and population centers. Users can print maps that show the data of interest for their areas. This information is useful to CEAs and watershed action groups teaching stakeholders how land use patterns may affect 303(d) designation for local water bodies. Full-access users are able to download, supplement and manipulate the data layers provided.

The Southern Region is expanding its use of the GIS tools and data layers available through the Southern Region Water Quality Information Database as it implements regional Master Farmer and Master Watershed Steward initiatives. Supplemental data layers such as aerial

photos, parcels, drainage patterns, subwatersheds, wetlands and elevation for the watershed of interest will be made available through the Database. In addition, detailed analyses indicating potential risk areas will be illustrated through the ArcIMS viewer on the website. These data layers and analyses are extremely helpful in explaining and illustrating watershed hydrology principles at the local level. Maps generated by the website also will be helpful in the process of Watershed Protection Plan development. In addition, the website allows data such as GPS locations, monitoring information, and impervious surface area to be uploaded for detailed analysis with ArcIMS tools.