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GRANT AMT: \$2,670,000

INVESTIGATOR: McFarland, M. L.; Jennings, G. D.; Gardner, C.

PERFORMING INSTITUTION:

SOIL & CROP SCIENCES

TEXAS A&M A&M AGRILIFE EXTENSION SERVICE

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SOUTHERN REGION WATER RESOURCE PROJECT

NON-TECHNICAL SUMMARY: Water quality and water quantity are interrelated, high-priority issues throughout the Southern Region. Although unique regional characteristics and local edaphic and climatological factors are important, basic common causes of water quality impairment and water resource depletion exist throughout the region and across the country. These common drivers and the related multi-state programming needs serve as the basis and impetus for this project. The primary goal of the project is to promote regional coordination to effectively and more efficiently allocate and target research, education and extension resources for identification, management, and resolution of water quality and quantity problems. The **Southern Region Water Resource Project (SRWRP)** expands and strengthens an existing collaborative process through which new and existing technologies and management systems can be developed, shared and implemented 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.

OBJECTIVES: The **Southern Region Water Resource Project** will expand and strengthen an existing collaborative process through which new and existing technologies and management systems can be developed, shared and implemented throughout the region and nation. Most importantly, it will provide a means for channeling and leveraging technical and financial resources to more effectively address

critical water quality and interrelated water quantity issues. Primary objectives of this project are, Objective 1: Support ongoing efforts of the regional coordinating committee to conduct program planning and communication, define and prioritize research and educational needs, identify expertise of contributing institutions, and facilitate resource sharing and technology transfer among institutions and with other federal and state agencies, organizations and stakeholders. Objective 2: Develop and deliver high impact multi-state and regional programs that apply the best available science in water resource management through facilitation of seven Regional Program Teams established to integrate research, education, and extension, share information and resources, minimize duplication of effort, strengthen and initiate new partnerships, and leverage multiple funding sources to address critical water resource issues. Objective 3: Maintain and expand the watershed-based 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. Objective 4: Support the CSREES National Integrated Water Program by linking with and supporting other CSREES programs and initiatives, providing leadership for the organization and management of the CSREES National Water Program Conference, coordinating the development of resources for national program marketing, and by actively participating on the Committee for Shared Leadership for Water Quality.

APPROACH: Methods for Objective 1: The **Southern Region Water** Quality Planning Committee composed of designated Water Quality Coordinators from 1862 and 1890 land grant institutions serves as the Regional Coordinating Committee and provides centralized coordination and networking both internally and with other regional water resources management programs. The Committee also promotes technology development and exchange, and foster collaborative, multi-state and multi-disciplinary efforts to more effectively and efficiently address common issues and concerns. This Committee has both the authority and the capability to carry out this objective due to its longstanding activity as the **Southern Region Water** Quality Planning Committee and its endorsement by Deans, Directors, and Administrators. Methods for Objective 2: The central focus of the project is facilitation and support of Regional Program Teams to identify and prioritize issues, develop science-based resources, and conduct multi-state and regional activities to address critical needs. The leadership for each Program Team includes at least one Institution Coordinator to ensure continuity with overall program objectives, personnel from all other participating institutions, as well as personnel representing key external partners. 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 multi-state and regional programs. Initial program teams include Nutrient Management, Animal Waste Management, Irrigation Water Management, Drinking Water and Rural Urban Interface Education, Water Policy and Economics, Watershed Assessment and Modeling, and Watershed Education and Restoration. Methods for Objective 3: Maintain and work to enhance the interactive, web-based information and reporting system at TAMU to manage information and resources identified and developed by states and Program Teams, including applicable

research data and reports, publications, education and training resources, and websites. Methods for Objective 4: The Southern Region provides support to the CSREES National Integrated Water Program by assuming responsibility for key tasks that provide benefit and enhance overall national program success, and by continuing to participate actively on the Committee for Shared Leadership for Water Quality (CSL-WQ). Primary tasks will include leading planning and management of the annual CSREES National Integrated Water Program Conference, leading development of the annual impact report for the National Water Program, and participation on the CSL-WQ.

PROGRESS:

OUTPUTS: The Southern Region Project utilizes 7 Regional Program Teams to target critical issues related to water resources: (1) Nutrient Management, (2) Animal Waste Management, (3) Irrigation Water Management, (4) Drinking Water and Rural/Urban Interface Education, (5) Water Policy and Economics, (6) Watershed Assessment and Modeling, and (7) Watershed Education and Restoration. These Regional Program Areas encompass the eight national water resource themes, and represent key areas of need for agricultural and rural communities in the South. Program teams are composed of extension and research/teaching personnel from 1862 and 1890 institutions in states targeting that issue with integrated efforts in extension, research, and education. Multi-state training programs were conducted to address a variety of important water resource issues including: Erosion and Sediment Control - 16 events reaching 880 professionals; Stream Restoration - 7 events reaching 640 professionals; Stormwater Control - 12 events for 725 professionals; Youth Water Education (hands-on learning) - 28 events for 3200 K-12 youth. Resources developed through collaborative efforts also were delivered within individual states with significant increases in producer knowledge and intentions to adopt. For example, in Tennessee before a Large Animal Mortality Management training participants rated themselves, on a 1-5 scale, for key topic areas: 1.88, 1.80, and 2.00; after training participants rated themselves 3.80, 4.63, and 4.08, respectively. The SR 4-H₂O youth water curriculum was completed (<http://www.ca.uky.edu/enri/4H2O.htm>) and piloted in 6 counties in Georgia. In addition, a Water Conservation Tools survey of Water Utility Managers was conducted in Oklahoma, Arkansas, Florida, and Tennessee and a Water Conservation Attitudes and Behaviors survey of Water Consumers was conducted in Oklahoma, Arkansas, Florida, Tennessee and Texas and the results published in the Journal of Extension. Continued collaboration with 1890 institutions has further expanded their programs: Tennessee State University initiated a down well camera program (created in Georgia) which was used to evaluate 7 wells for owners and train students in groundwater protection. NCA&T collaborated with NCSU to develop a low impact development program which includes the use of rainwater harvesting and rain gardens. A total of 9 Multi-State Special Project grants were initiated through a regional competitive grants process and included projects addressing pharmaceuticals as emerging contaminants, livestock nutrient management planning, slow release nitrogen fertilizers, watershed academies, youth water education curriculum development, and water resource training for underserved communities. The Southern Region provided leadership for the organization and management of the National Water Program Conference in Washington, D.C., coordinated development of the National Water Program Impact

Report, and conducted planning for a regional training event to be held in Athens, Georgia (Sept. 2011). PARTICIPANTS: Key Personnel Dr. Jimmy A. Bonner, Mississippi State University serves as a member of the SRWQPC and, as and participates in all planning efforts and meetings associated with the project. Dr. Mike Daniels, University of Arkansas serves as a member of the SRWQPC and, as and participates in all planning efforts and meetings associated with the project. Dr. Cassel Gardner, Florida A&M University serves as a member of the SRWQPC; is the 1890 Institution representative to the Committee for Shared Leadership for Water Quality (CSL-WQ); and participates in all planning meetings associated with the project. Dr. Eve Brantley, Auburn University serves as a member of the SRWQPC; Program Leader for Drinking Water and Human Health, and participates in all planning efforts and meetings associated with the project. Dr. Calvin Sawyer, Clemson University serves as a member of the SRWQPC; and participates in all planning efforts and meetings associated with the project. Dr. Greg Jennings, North Carolina State University serves as a member of the SRWQPC, as Regional Coordinator for Region IV, and as a member of the CSL-WQ; serves as a PD for the Regional Project, as Program Leader for Watershed Education and Restoration. Dr. Jennings participates in all planning efforts and meetings associated with the project. Dr. Brian LeBlanc, Louisiana State University serves as a member of the SRWQPC and participates in all planning efforts and meetings associated with the project. Dr. Mark L. McFarland, Texas A&M University serves as a member of the SRWQPC, as Regional Coordinator for Region VI, and as a member of the CSL-WQ; and serves as PD for the Regional Project, as Program Leader for Nutrient Management. Dr. McFarland participates in all planning efforts and meetings associated with the project. Dr. Tom Obreza, University of Florida serves as a member of the SRWQPC and co-leader for Irrigation Water Management and participates in all planning efforts and meetings associated with the project. Dr. L. Mark Risse, University of Georgia serves as a member of the SRWQPC; serves as a Program Leader for Animal Waste Management participates in all planning efforts and meetings associated with the project. Mr. Craig Runyan, New Mexico State University, serves as a member of the SRWQPC and as Program Co-Leader for Irrigation Water Management, and participates in all planning efforts and meetings associated with the project. Dr. Shawn Hawkins, University of Tennessee serves as a member of the SRWQPC and participates in all planning efforts and meetings associated with the project. Dr. Michael D. Smolen, Oklahoma State University serves as a member of the SRWQPC, and, as PD for the regional project, as Co-Leader for Water Policy and Economics, and participates in all planning efforts and meetings associated with the project. Dr. Raghavan Srinivasan, Texas A&M University administers all activities associated with the regional water quality database and participates in planning efforts and meetings associated with the project. TARGET AUDIENCES: The target audience of this regional coordination project includes all watershed stakeholders in the southern region of the U.S. including students K-graduate/professional school; residents, homeowners, landowners and managers; city and county agencies; local, state and federal natural resource and regulatory agencies; and citizen groups including non-governmental organizations. PROJECT MODIFICATIONS: Nothing significant to report during this reporting period.

IMPACT: 2010/09 TO 2011/08

Impacts of the regional program are functionally demonstrated at state and local levels. Case examples include the following: In Tennessee, over 400 stream miles were delisted in 2010, including 13.57 miles in the Pond Creek watershed where UT Extension has focused water quality education and BMP installation efforts. The LSU AgCenter worked in concert with state and local governments to implement regionally developed programs in livestock management, urban water quality management (Yard and Neighbors Pollution Reduction Program), and 4-H watershed education, as well as others; as a result, in part, in 2010-11 the Bogue Falaya, Tangipahoa, and Tchefuncte Rivers were de-listed. In Arkansas, training facilitated development of 738 nutrient management plans for 46,923 acres in the nutrient impaired Illinois River Watershed reducing the average litter application rate by 2.4 tons/acre which translates into a reduction of 6.6 million pounds of phosphorus per year within the watershed. In Texas, 27 Texas Watershed Steward workshops were delivered to a total of 1340 individuals representing over 2,950 contact hours. Pre/post testing verified that participant knowledge regarding watersheds, water pollution, water quality regulation, and watershed management increased by nearly 32%. Average post-test scores are 90% and over 80% of participants reported the intent to adopt one or more Best Management Practices to help improve and protect their watershed. In addition, 13 educational events conducted across the state targeting nitrogen management in corn, cotton, and grain sorghum reached 935 agricultural producers and provided over 1120 contact hours. In Mississippi, educational programs conducted in concert with a Waste Pesticide Disposal Program resulted in collection of 55,909 pounds of agricultural pesticides in 15 counties. On a regional basis, the Nutrient Management Team completed a 6-state, two-year study of slow release nitrogen fertilizer products and nitrogen fertilizer stabilizers. A slide set and regional report were developed summarizing project findings which demonstrated little or no benefit from any of the non-traditional products tested.

PUBLICATIONS (not previously reported): 2010/09 TO 2011/08

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