

2009-2010 Special Projects

Boellstorff: A Southern Region Well Owner Network to Safeguard Private Well and Aquifer Integrity

Management and protection of private, domestic drinking water sources are under the control of the landowner, and therefore, depend primarily on education rather than regulation. Socio-geographic changes are placing increased pressure on water resources, and population expansion in areas where municipal and industrial demands already are great, and in arid regions where water is always scarce, are intensifying concerns. To avoid diminished groundwater quality, it is critical to provide information to well owners regarding the consequences of linkages between contaminated surface and near-surface water and groundwater. Impacts include both on-site health consequences for private well owners and their families, and adverse off-site impacts to underlying aquifers. Contaminant conveyance may be established by inadequate wellhead protection, aging and failure of well construction materials, improper well construction techniques, abandoned wells, improperly sited and functioning on-site wastewater treatment systems, and changes in land use. The aim of the proposed Southern Region Well Owner Network (SRWON) program is to improve private well management to safeguard drinking water supplies and aquifer integrity. The SRWON will improve rural and rural-urban interface environmental management by providing outreach information necessary for private well owners to protect the health of their families and groundwater resources vital to meeting increasing water needs in the South.

Jennings: Agent Training in Watershed Education and Restoration

This project will support three components with the overall goal of increasing Southern Region Extension Agent competence in watershed education and restoration:

- Component 1 is a 3-day “hands-on” Agent Training Workshop on “Effective Education in Developing Watersheds” for 35 Extension Agents working in high-growth watersheds in the Southern Region.
- Component 2 is a Webinar for Extension Agents and other watershed professionals on “Vegetation Applications for Ecosystem Restoration.”
- Component 3 is support for 20 Agents to participate in the “Southeast Stream Restoration Conference” to be held in Charlotte in November, 2010.

All of the proposed Agent Training components will build capacity within the Southern Region Extension network for Agents with primary responsibilities in Agriculture, Natural Resources, Horticulture, 4-H, and Community Resource Development. The strengthened network will ultimately lead to better local watershed education and restoration programs and better water quality and ecosystem health.

Sharpley: Impact of Biofuel Production on Water Quality in the Southern Region: A Workshop Dialogue Focusing on Research and Extension Needs

Increased fluctuations in energy prices and the proposal of former President George W. Bush in his 2006 State of the Union Address that biofuels replace 75% of imported oil by 2025, has fueled tremendous interest and activity in biofuel production, which has focused to a large extent on grain-based ethanol. Cellulosic fuel-stocks from perennials, such as switchgrass and woody materials, have the potential to produce bioenergy either through producing ethanol or other liquid fuels or through direct combustion to co-generate heat and electricity.

These uses of cellulosic renewable energy could provide multiple ecosystem services that include energy, carbon sequestration, and improved water quality. Several Freshwater Initiatives are being developed by Federal and NGO’s to address broader issues facing water quality in the Southern Region that will impact

biofuel production. These Initiatives encourage redesign of the agricultural landscape by using buffers and/or wetlands wherever intensive row crops are grown and to make perennial-based cellulosic ethanol economically viable so perennials can be grown on both productive and marginal lands.

While several recent conferences and white papers have addressed national and regional issues related to grain and cellulosic feedstock production and conversion to biofuel, none have addressed issues specific to the Southern Region (i.e., AL, AR, FL, GA, KY, LA, MS, NC, NM, OK, SC, TN, TX). This proposal outlines a Workshop to fill this important research, extension, and education gap for the Southern Region.

Saraswat: Watershed Assessment and Modeling (WAM)

The Regional Watershed Assessment and Modeling (WAM) Team conducted a region-wide survey during early 2009 to assess interest, knowledge, and needs of extension agents from both 1890 and 1862 Land Grant Institutions regarding GPS/GIS technology. The purpose was to direct the course for promoting the use of spatial technologies for watershed protection and restoration purposes. The survey was an outcome of the strategic process that was started during a meeting at the 2007 Southern Regional Water Quality Conference in Fayetteville, Arkansas. The WAM Team intends to use the survey results to focus on ways to expand the use of technology-mediated watershed assessment tools among various target audiences (cooperative extension personnel and other watershed assessment groups) through the development of a watershed assessment training initiative referred to as **W**atershed **A**ssessment **T**ools for **E**xtension and **R**esearch (WATER). The team feels that by providing this type of training for county extension agents, municipal water managers, water quality volunteers, and other relevant stakeholders, more professionals will gain a better understanding of regional watershed issues and more effective local watershed protection and restoration efforts can be implemented. The goal is to also enhance the Southern Regional Water Program (SRWP) website (<http://srwqis.tamu.edu>) by adding information related to water quality and quantity for individual watersheds and by providing more detail on specific water quality impairments.

These measures will help educate watershed stakeholders and other water resource professionals and volunteers in using watershed assessment tools. This will lead to a true understanding of the dynamics of watersheds; better conservation and land use decisions, and ultimately allow them to extend the knowledge to their constituents and communities.

Osborne: Southern Region 4-H₂O Ambassador Program

The Southern Region 4-H₂O Ambassador Program Team is currently developing four curriculum units, each of which focuses on a specific question related to water quality and watersheds. Each unit (stated below) will include hands-on, investigative activities (e.g., chemical, biological, and physical analysis of local water bodies, watershed mapping, and community-based research).

The units will be piloted in KY, TN, and GA in Fall 2009 and Spring 2010. Revisions will be made and units completed by Summer 2010. Train-the-trainer webinar sessions will be offered in Fall 2010 and Spring 2011. In addition to webinar sessions, training sessions will be offered at regional and national conferences.

Wilson: Assessing and Improving Nutrient Management Plan Implementation across the Southern Region

This multi-year project is designed to improve nutrient management plan implementation by livestock farmers throughout the southern region and thereby protect and improve water quality. The proposed work will establish a multi-state, collaborative framework to identify needed Extension education efforts

to accomplish this goal. These overarching objectives and methods are directly relevant to the primary goals of the Southern Region Water Program.

Despite the regulatory emphasis nutrient management planning and the largely cost free management plan development process, the Animal Waste Management Team has concluded that the larger Extension community broadly recognizes that livestock producers do not readily adopt or often successfully implement nutrient management plans. Thus, the more specific objectives of this project are to identify obstacles to nutrient management plan adoption and implementation and better governmental policy and incentives to improve animal waste/nutrient management on livestock farms. This objective strengthens the link between the southern land grant university system and federal/state/local agencies that are stakeholders in the nutrient management process on livestock.

Adams: Evaluating Public Support for Water Conservation Tools Appropriate for Local Conditions

This project supports the development of water conservation programs in several Southern states. We address the following specifically-identified needs and goals outlined in the Southern Regional Water Resources Program (SRWRP) work plan approved by USDA-CSREES:

- We focus directly on providing baseline information on alternative water use efficiency and conservation policy tools that can be used to address water supply shortages.
- We expect the project to improve the understanding of potential public acceptance and support for alternative water policy tools by professionals in the land grant system, policymakers, and other stakeholders.
- The PIs and collaborators have expertise in economics, policy analysis, law and other fields represented within the land grant system. We draw from this expertise to create deliverables that should improve the recognition of this expertise by stakeholders, particularly relating to water policy decision-making and drought management.

Osmond: Slow-Release Fertilizers

Nitrogen impacts important water resources, such as Tampa Bay, the Neuse Estuary and the Gulf of Mexico, causing hypoxia and fish kills. Nitrogen leaching and runoff losses due to crop production are a major source of nitrogen to streams, rivers and estuaries in the southeast. Typically, nitrogen use efficiency of cereal crops is around 50% (grain + stover). Slow release nitrogen fertilizers have potential to improve nitrogen use efficiency corn and other field crops, and thus release nitrogen losses to water resources. With this in mind, we are proposing regional slow-release fertilizer tests.

Risse: Southeastern US Water Resources Initiative

The purpose of this project is to support the development of a strategic framework for a Water Resources Initiative in the Southeastern U.S. A broad spectrum of academic, federal, and state entities have expressed interest in collaborating in the development of this initiative to provide a foundation for regional water resources assessment and management. While the initial effort is to utilize resources at the University of Georgia (including the Athens, Tifton, and Griffin campuses), the expectation is that this would expand to partner with other academic institutions within Georgia (e.g., Georgia Tech, Georgia State, Emory, etc.), as well as other academic institutions within the Southeastern U.S. (other public and private universities in the region). Although focused primarily on building a consortium of institutes of higher education, it is also intended to provide a forum for bringing together the relevant federal, regional, state, and local governmental and nongovernmental organizations, as well as related professional organizations. To get such an initiative underway, UGA is proposing to host the first regional conference in 2010. A series of meetings leading up to this regional meeting, focused on the role of science in

solving interstate water disputes is also being proposed. The purpose of this grant is to insure that the Southern Region Water Quality program is an active participant in this process.