

J. Phil Campbell, Senior, Natural Resource Conservation Center U.S. Department of Agriculture, Agricultural Research Service

The J. Phil Campbell Natural Resource Conservation Center (JPC-NRCC) is one of nearly 100 research locations in the Agricultural Research Service (ARS), the primary research agency in the U.S. Department of Agriculture. Since its creation in 1937, the 1180-acre Center has recognized the critical role agricultural

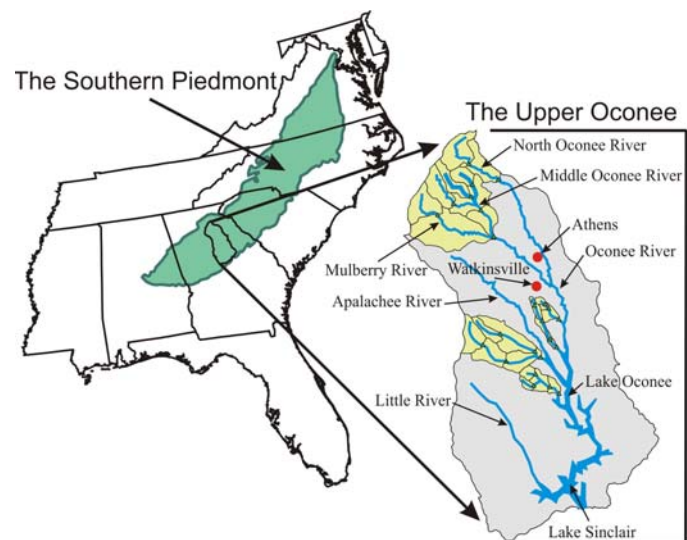


research has in solving natural resource problems of broad significance to the public. Over the past 70 years the Center's scientists have researched agricultural production systems to provide invaluable information for designing practical approaches to land management for optimum use and conservation of natural resources. Our research ranges in scope from improved understanding of biological, chemical and physical processes that limit agricultural productivity and sustainability, to interactions of ecosystems within landscapes.

The Center's mission is to develop and transfer environmentally sustainable and profitable agricultural systems to land owners and managers in order to protect the natural resource base, build accord with non-agricultural sectors, and support healthy rural economies. We carry out this goal with a dedicated and highly trained staff of 7 research scientists and 20+ technical and administrative support people. We also employ University of Georgia support personnel and students to help conduct research. Our close proximity to and historical relationship with the University of Georgia College of Agriculture and Environmental Sciences enhances and strengthens complementary programs for developing efficient, economical, and socially acceptable farming practices for Georgia, the Nation, and the World.

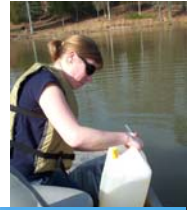
Currently, the FY 2008 federal base funding (net to the location) for the Center is \$2.8 million. The Center also has been successful in competing for grants, which bring in about \$450,000 annually to support research. These 'soft funds' from grants are critical to meeting the mission of the Center during a period of reduced base funding for agricultural research.

Research at JPC-NRCC is focused on improving soil quality and water quality and quantity in Southeastern pasture and cropping systems; developing sustainable crop and animal production systems suitable for the Southeast; and preventing pathogen transport to Southern Piedmont landscapes from poultry and other animal production systems. To ensure that our programs are relevant to high priority needs, they are based in part on recommendations from many sources; among them, the Administration, the Congress, commodity organizations, customer and stakeholder groups, collaborators and cooperators, advisory committees, and action and regulatory agencies in and outside the Department. Our research is closely coordinated in Washington, D.C. by the ARS Administrator and National Program offices to avoid duplication, and to help maximize and transfer research benefits.



Some Recent Accomplishments Include:

- Identifying that the source of most microorganisms used to indicate pathogen contamination in the Upper Oconee river watershed was associated with wildlife and not agriculture.
- Determining that farm ponds are an effective environmental management practice to clean manure-associated bacteria from water.
- Discovering that well-fertilized endophyte-infected fescue pastures have the potential to reduce carbon dioxide in the atmosphere by storing more carbon in soil.
- Using intensive data collected since 1940 to validate the critical need to protect Southern Piedmont farmlands by maintaining vegetative cover all year around.
- Identifying the best tillage practice to maximize net returns, reduce erosion, and improve soil quality for cotton producers in the Southern Piedmont.
- Identified that haying of bermudagrass is an effective management tool to reduce phosphorus contamination of surface waters (excess phosphorus causes algae growth and reduces oxygen available to fish and other aquatic life).
- Determining that aeration of grassland soils fertilized with broiler litter could capture 35% more rainfall and reduce P losses on well-drained soils.
- Working with US-EPA to discover that iron in clay soils, common in the Southeast, helps reduce nitrate contamination of ground water.
- Developing methods to accurately measure greenhouse gas emissions from confined animal feeding operations (CAFOs) and identifying management practices to mitigate these emissions.
- Determining that application of poultry litter to cropping systems does not pose a risk of contaminating surface waters with two sex hormones, estradiol and testosterone, of recent concern to the public.
- Working with other ARS units, determining that hay cutting in the afternoon provides higher quality forage that is preferred by animals and increases animal performance compared with forage cut in the morning.



Future Challenges: As important as these strides have been in providing conservation practices for crop and animal production systems, increasing urbanization of the Southeast continues to make additional research solutions vital and urgent. Research challenges and opportunities for the near and long-term future include:

- Developing improved guidelines for land application of animal manures.
- Developing guidelines for managing soil and water resources wisely due to the tremendous growth of the equine industry.
- Developing improved management practices to store carbon and mitigate global change impacts from agricultural activities.
- Developing and coordinating a national system for bacterial source tracking, based on DNA fingerprinting, of fecal bacteria in contaminated water.
- Developing organic production methods for grain to be used in the rapidly growing market for certified organic poultry production
- Developing integrated crop-livestock systems that are profitable, efficient and environmentally friendly for major physiographic regions in the Southeast.
- Continuing research to increase adoption of conservation tillage on Georgia's 3.5 million acres of row crops. This could conserve water equivalent to 110 days of the state's annual water use, or 1.4 years of greater Atlanta's annual water use.
- Researching the potential for flue gas desulfurization (FGD) gypsum from coal burning power plants to improve soil productivity, water quality and quantity, and profitability of agricultural production systems; and developing guidelines for its application. Within the next 10 years, millions of tons of this product will be generated by power plants across the Southeast and the nation.

