

Gulf Atlantic Coastal Plain LTAR, Tifton, GA

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The Gulf-Atlantic Coastal Plain physiographic region was identified in 1965 as a priority location for a regional hydrology research center. The region extends from Delaware in the Northeast to the Gulf Coast of Texas and consists mainly of low-elevation flat to rolling terrain with numerous streams, abundant rainfall, high net primary productivity, a complex coastline, and many wetlands. The region is characterized by long growing seasons, a humid climate, intense pest and weed pressures, and intense convective storms that generate large runoff events during the growing season. The Gulf Atlantic LTAR (GA-LTAR) is managed by the Southeast Watershed Research Laboratory (SEWRL) at Tifton, GA. The SEWRL was established in 1965 with the 334 km² Little River Experimental Watershed ([LREW](#)) as the primary field research site. The LREW is in the headwaters of the Suwannee River Basin, a major interstate basin that begins in Georgia, empties into the Gulf of Mexico in the Big Bend region of Florida, and is considered to be generally representative of the climate, topography, soils, geology, stream networks, and agricultural production systems within the Level III Southeastern Plains ecoregion. The LREW falls within the Gulf Atlantic Coastal Plain Farm Resource Region, HUC (03), and NEON domain (D3). There are no point sources within the watershed, which is about 50% agricultural, 45% forest, and 5% other. The watershed allows opportunities to characterize how a relatively undeveloped landscape will respond to increasing urbanization, water demand, and other anthropogenic stresses.

At the core of the GA-LTAR are three ARS units partnering to enhance both productivity and resource use efficiency: 1) the Southeast Watershed Research Laboratory with projects in Water Availability and Watershed Management, and Climate Change, Soils, and Emissions; 2) the Crop Genetics and Breeding Research Unit with projects in Pasture and Forages, Biomass production for renewable energy, and Genomics, and Genetic Improvement of grasses for yield as well as biotic and abiotic stress resistance; and 3) the Crop Protection and Management Research Unit with projects in Plant Diseases, Plant Genetic Resources, Genomics, and Genetic Improvement, and Crop Protection & Quarantine. The GA-LTAR efforts are focused on developing profitable agricultural production systems that: include biofuels crops, improve environmental quality, reduce agricultural water demand, minimize the importation of animal feeds from outside the region, incorporate production on marginal lands while maintaining certification for USDA Conservation Program support, and improve our understanding of the effects that interactions between environmental change and human use of natural resources have on the provisioning of ecosystem services (e.g., food, fiber, feed and fuel production, adequate clean water, trace gas emissions reductions and carbon sequestration) from agricultural landscapes. The GA-LTAR at Tifton is also home to the USDA Southeastern Regional Biomass Research Center (SERBRC), one of five national centers whose mission is to help accelerate the establishment of commercial biomass production from farms and forests in ways that do not disrupt food, feed, and fiber markets and that enhance natural resources quality.

Principal research emphases at the GA-LTAR include:

1. *Baseflow hydrology of coastal plain watersheds that are controlled by alluvial aquifer*
2. *Riparian ecosystems as nutrient sinks in agricultural watersheds*
3. *Development of models of field and riparian zones (GLEAMS and REMM)*
4. *Effects of land use on agricultural water quality*
5. *Validation and testing of remote sensing platforms.*
6. *Validation and testing of watershed models (SWAT, AnnAGNPS).*
7. *Satellite-derived maps of conservation tillage.*
8. *Development of mitigation strategies to reduce pesticide inputs to ground- and surface water*
9. *Development of applied technology for use of animal manures*
10. *Effects of agricultural practices on water availability and use efficiency*
11. *Distribution of ecosystem services within landscapes and watersheds*
12. *Potential for and impacts from biofuels production*