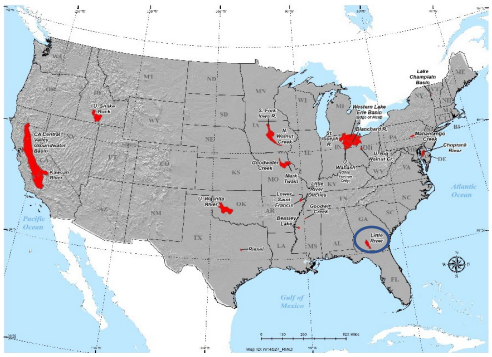
Little River Watershed

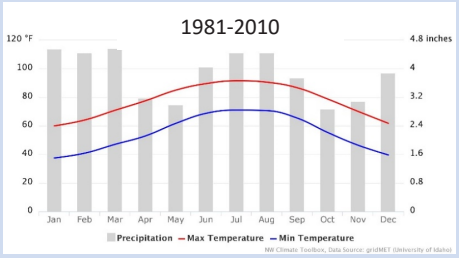


A Conservation Effects Assessment Project (CEAP) Watershed Assessment Study: A collaboration between the Agricultural Research Service and the Natural Resources Conservation Service

Location

The 129-mi^2 Little River Watershed is at the headwaters of the Suwannee River Basin in South-central Georgia and North Florida.

Temperature and Precipitation



Major land uses

Cropland: 37% Cultivated Crops (Cotton, Peanut, Corn)
Grassland: 14% Pasture and Herbaceous
Woodland: 29% Forest and Shrubs
Wetland: 14%, Predominantly Forest
Urban: 5%
Open Water: 1%

Data collection

Beginning in 1967, stream discharge has been measured every 5 minutes. Automated samplers have collected flow weighted composite water samples since 1974. Plot and field studies have been conducted since 1969. Sediment, nitrogen, phosphorus, and herbicide concentrations have been characterized at the watershed and field scales. Rain gauges have been installed since 1968, soil moisture probes since 2001, and meteorological stations since 2003.

Concerns

Riparian buffers throughout the watershed are a key component to maintaining watershed health, occupying up to 14% of the watershed area. Decreasing profit margins are leading to increased irrigation, which leads to reduced riparian acreage. In addition, increased irrigation can lead to reduced aquifer levels.

Conservation tillage is seen as important for improving soil health and reducing environmental impact. However, the use of conservation tillage has recently been threatened by an evolution of herbicide-resistant weeds. New farming systems are necessary to overcome this issue. Furthermore, most soils in the watershed have restrictive subsoils, which promote shallow lateral flow during saturated periods. Reduced percolation makes local soils more susceptible to spring erosion and increased peak flow.

Riparian buffers can be an effective tool for reducing sediment, nutrient and pesticide transport. However, high water loss can lead to high levels of nutrient loss even at low concentrations. Because of this, new systems are needed to reduce overall agrichemical losses.

Main conservation practices used

A number of conservation practices are regularly used in the watershed. Several have been studied and assessed. These practices include riparian buffers, grass water-ways, strip-tillage, and winter cover crops.

Other practices used in the watershed include nutrient management, pest management, contour farming, seasonal residue management, and terraces. Riparian buffers, although prevalent throughout the watershed, are naturally occurring and largely unsupported by government programs.

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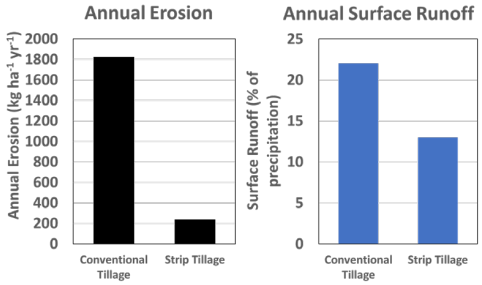
Outcomes/Findings

Plot and field scale

- Strip tillage reduced surface runoff (2X) and losses of sediment (7X), total pesticide (2X), and total nutrients (0.5X).

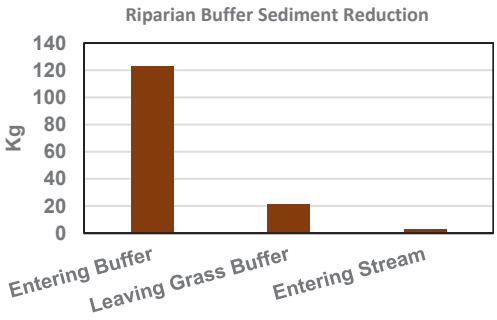


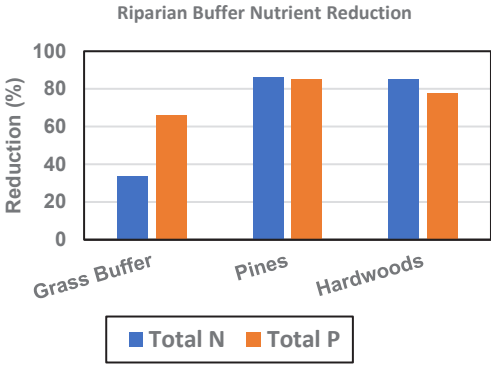
- Strip tillage enriched total organic nitrogen (1.5X) and total organic carbon (1.5X) in surface runoff.
- Winter cover crops reduced sediment losses during spring periods of high runoff (4X) and increased soil carbon (1.2 X).
- Characterization of water losses indicated that while strip tillage significantly reduced surface runoff and transport of agrichemicals, subsurface water and soluble agrichemical losses increased (1.5X) due to higher infiltration.

Left: Collecting water quality measurements. Right: Little River Station F.

Watershed scale

- The primary runoff-producing areas within regional watersheds are the low-lying, poorly drained, near-stream areas.
- Riparian buffers can reduce sediment transport, nutrient mass, and herbicide concentrations associated with surface runoff each by a factor of 10 (see charts on right).
- Baseflow accounts for 53% of all Little River Streamflow.
- A methodology for assessments of conservation tillage mapping was developed with 71–78% accuracy.
- Successful delineation of conservation vs. conventional tillage regimes within the LREW was completed.





Collaborators and Stakeholders

USGS science for a changing world
Georgia Cotton Commission
Georgia Conservation Tillage Alliance
University of Georgia

More Information

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