

Conjunctive Water Use Protects Mid-South Aquifers: #2779



Overview

The National Resources Conservation Service (NRCS) in Arkansas, Louisiana, and Mississippi have been working with agricultural producers to improve irrigation efficiencies and reduce groundwater use. Programs like the Environmental Quality Incentives Program (EQIP) have provided financial and technical assistance for practices such as irrigation water management, pump improvements, and soil moisture sensors. Progress has been made in reducing groundwater withdrawals while maintaining crop yields.

The next primary strategy for reducing groundwater use is more effective use of available surface waters for irrigation. Natural rivers, bayous, oxbow lakes, drainage canals, constructed tailwater, and on-farm reservoir storage provide ample sources of irrigation waters that can be used first and foremost each growing season. Turning to available surface-water irrigation offers significant relief for groundwater resources and is the combined solution for stressed groundwater resources.

Over the last two years, Rice Stewardship staff worked with Louisiana and Mississippi NRCS to hold EQIP sign-ups for surface water irrigation development and improvements. Phase I results show that even if surface water replaced groundwater 100%, payback time for total project cost would range from 14 to 17 years in the Mississippi Delta and 6 to 7½ years in Southwest Louisiana. However, with significant financial assistance from the NRCS and EQIP, the producer's out-of-pocket expense would be recovered in ≤4 years in the Delta and ≤2½ years in Southwest Louisiana.

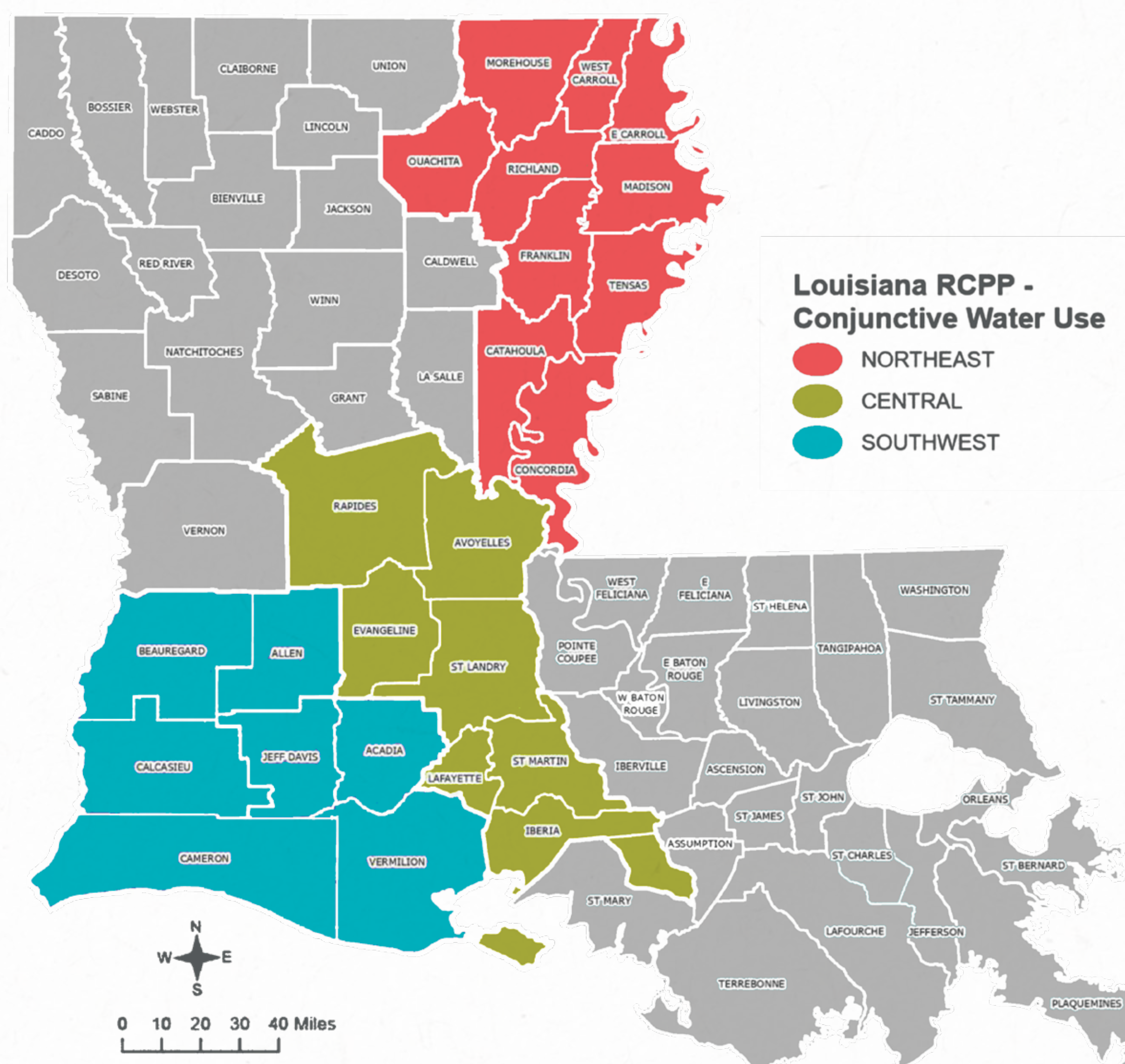
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Natural Resources Conservation Service

Goals & Objectives

- This RCPP Project addresses water management, pump improvement, and automation, and soil moisture sensors.
- The Project helps farmers implement practices and systems that increase the availability of surface water resources for irrigation.
- The goal is to increase irrigation efficiency with the aim of reducing dependency on dwindling MidSouth Aquifers.

Project Area Map



PHASE IV - SURFACE WATER IRRIGATION PROJECTS



Activity Types

- Agricultural Water Enhancement activities such as irrigation water management.
- Installation of irrigation pipeline and pumping plants.
- Building structures such as dikes to control water flow into the designated fields.



Partners



Conservation Benefits

The overall benefits of Conjunctive Water Use are to minimize the impact on ground water used for agricultural purposes and restore MidSouth Aquifers.

Conservation Practices

- 342 - Critical Area Planting
- 356 - Dike and Levee
- 410 - Grade Stabilization Structure
- 430 - Irrigation Pipeline
- 449 - Irrigation Water Management
- 484 - Mulching
- 533 - Pumping Plant
- 587 - Structure for Water Control

Outcomes

This RCPP Project was awarded \$2,220,000 million dollars with over 12 active contracts with over 3270.71 acres of land throughout three separate funding areas within Louisiana.

Northeast LA: Catahoula, Concordia, East Carroll, Franklin, Madison, Morehouse, Ouachita, Richland, Tensas, and West Carroll.

Central LA: Avoyelles, Evangeline, Iberia, Lafayette, Rapides, St. Landry, and St. Martin.

Southwest LA: Acadia, Allen, Beauregard, Calcasieu, Cameron, Jefferson Davis, and Vermilion.

Each area differs in water irrigation needs and natural resources concerns. Rice and rice rotation lands are a priority.

SURFACE WATER FOR IRRIGATION - RETURN ON INVESTMENT PHASE II RESULTS

Region	PROJECT GENERAL TOTALS					PROJECT PAYOFF TIME IN YEARS BY TOTAL AND PRODUCER ONLY COSTS							
	No. Projects	Total Acres	Total Costs	Producer Cost ¹	Annual Irrigation ²	100% Surface		75% Surface		50% Surface		25% Surface	
						Total	Producer	Total	Producer	Total	Producer	Total	Producer
MISSISSIPPI DELTA	109	25,366	\$15,276,717	\$4,041,162	478,918 AC-IN/AC	10.2	2.7	13.6	3.6	20.4	5.4	40.9	10.8
						17.5	4.6	23.4	6.2	35.1	9.3	70.1	18.5
SOUTHWEST LOUISIANA	13	4,716	\$1,323,578	\$460,022	84,071 AC-IN/AC	5.0	1.8	6.7	2.3	10.1	3.5	20.2	7.0
						8.7	3.0	11.5	4.0	17.3	6.0	34.6	12.0

1. Producer cost is a portion of total cost and in the Mississippi Delta averaged 26%.
 2. Annual irrigation requirements based on an acre rotation of 40% rice, 40% soybeans, and 20% fallow. Base irrigation amounts published by Messer et al., 2017. Long-term measurements of agronomic crop irrigation needs in the Mississippi delta portion of the lower Mississippi River Valley. Irrigation Science 33:207-212.
 3. Diesel pumping plant costs based on farm gate fuel price of \$3.50/gallon.
 4. Electric pumping plant costs based on power charge of \$0.13 per kilowatt-hour.
 5. Producer cost is a portion of total cost and in Southwest Louisiana averaged 35%.
 6. Annual irrigation requirements based on an acre rotation of 40% rice, 20% crawfish aquaculture, and 40% fallow. Base irrigation amounts published by Balash et al., 2019. Developing rice varieties suitable for alternative irrigation regimes in Louisiana. LSU AgCenter Water Research Bulletin. W-R-18-001 and B-R-18-001. Louisiana Cereals Production Manual, LSU AgCenter Publication #2857.