



The Spread and Recent Extent of Irrigation in the Southeast

The irrigated area in the Southeast dramatically increased during the past half century. Irrigated farm land in Alabama, Georgia, Florida, and the Carolinas increased 452 percent from 1959 to 2012 (Census Bureau 1962 pp. 2; NASS 2014 pp. 332-338).

Farmers in the southeastern U.S. and elsewhere irrigate to increase their yields.

Yields of major row crops were 27 percent higher on irrigated than non-irrigated harvested land in the Southeast during 1997-2012, but irrigation is not the only reason for the exceedances. In the region 89 to 99 percent of irrigated areas were harvested croplands, not pastures (NASS 2004 pp. 318-324; NASS 2014 pp. 332-338).

Farmers also irrigate to reduce their risks, some of which depend on climatic variability.

Lack of rainfall at critical times can affect the yield and quality of a crop. Timely irrigation can prevent crop failure or at the least reduce variation in yield and quality. Farmers can use irrigation, if necessary, to adapt to long-term changes in climate.

Did irrigation also spread from 1997 to 2012 in Alabama, the Carolinas, Florida, and Georgia? What was the extent of irrigation in each of these states and the five-state region in 2012? Answers to these questions are based on data from the four, most recent Censuses of Agriculture.

Alabama

Irrigation in Alabama (AL) spread from 1997 to 2012.

Irrigated area and share of land in Alabama's farms increased 42 and 51 percent from 1997 to 2012, although the irrigated share of farm land was always the lowest in the region (Figure 1b). The irrigated share of land on irrigating farms fluctuated during the 15-year period (Figure 1a).

The number and proportion of farms that irrigated in Alabama increased from 1997 to 2007, but then slightly decreased in 2012 (Table 2). Alabama had the lowest number and proportion—one of every 25—farms that irrigated in the five-state region in 2012.

Florida

Irrigation consistently declined in Florida (FL) from 1997 to 2012. One reason for the decline was the spread of diseases of irrigated crops, particularly citrus greening.

The irrigated area and share of land on irrigating farms in Florida decreased from 1997 to 2012 (Table 1 and Figure 1a). The irrigated share of land on all farms also decreased over the same period (Figure 1b). Yet, the irrigated shares of land in

irrigating and all farms were always the highest in the region.

The number and proportion of farms that irrigated decreased in Florida from 1997 to 2012 (Table 2 and Figure 2). Yet, Florida still had the highest number and proportion of farms—one of every four—that irrigated in the five-state region in 2012. The proportion of irrigating farms in Florida well exceeded the proportion of irrigating farms in the U.S. during the period.

Georgia

Irrigation consistently spread in Georgia (GA) from 1997 to 2012.

The irrigated area in Georgia increased between each census and increased 46 percent from 1997 to 2012 (Figure 1b and Table 1). The irrigated shares of land in irrigating farms (Figure 1b) and all farms (Figure 1a) also steadily increased during the period. The irrigated shares of land in irrigating farms and all farms were the second highest in the region in 2012.

The number and proportion of Georgia’s farms that irrigated grew during 1997-2012 and were the second highest in the region in 2012 (Table 2).

North Carolina

Farmer use of irrigation fluctuated in North Carolina (NC) between 1997 and 2012.

Irrigated area in North Carolina was 12 percent larger in 2012 than in 1997, but the irrigated area decreased from 2002 (Table 1). The irrigated shares of land on irrigating farms (Figure 1a) and all farms (Figure 1b) decreased from 2007 and from 2002. The irrigated shares of land in irrigating farms and in all farms in North Carolina were the lowest and second lowest (Figure 1b) in the region in 2012.

The number and proportion of farms that irrigated in North Carolina increased from 1997 to 2002, but then decreased in 2007 and 2012 (Table 2). The proportion of farms that irrigated in North Carolina in 2012 was the second lowest in the region.

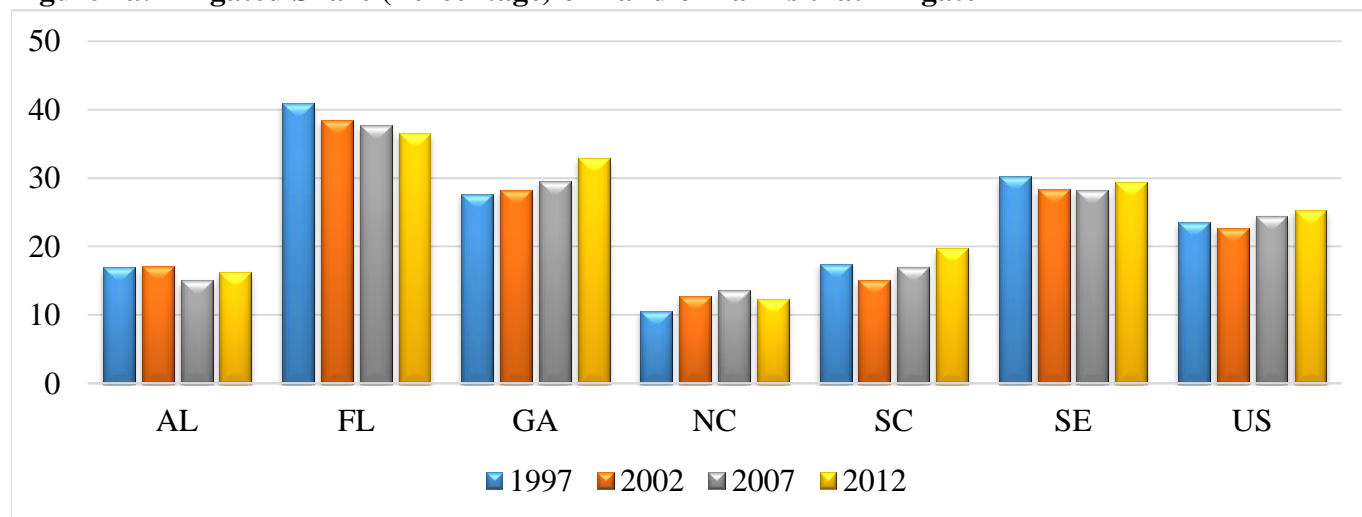
South Carolina

Irrigation spread in South Carolina (SC) from 1997 to 2012.

Irrigated area in South Carolina increased between each Census and increased 79 percent from 1997 to 2012 (Table 1). The irrigated share of land in irrigating farms decreased from 1997 to 2002 but increased afterwards (Figure 1a). The irrigated share of farm land increased in each Census (Figure 1b).

The number and proportion of farms that irrigated in South Carolina increased from 1997 to 2007, but then slightly decreased in 2012 (Figure 2 and Table 2). The proportion of farms that irrigated in South Carolina in 2012 was the second lowest among the five states in the region.

Figure 1a: Irrigated Share (Percentage) of Land of Farms that Irrigate¹



¹ 100 x (Irrigated Farm Land)/(Land of Farms that Irrigate)

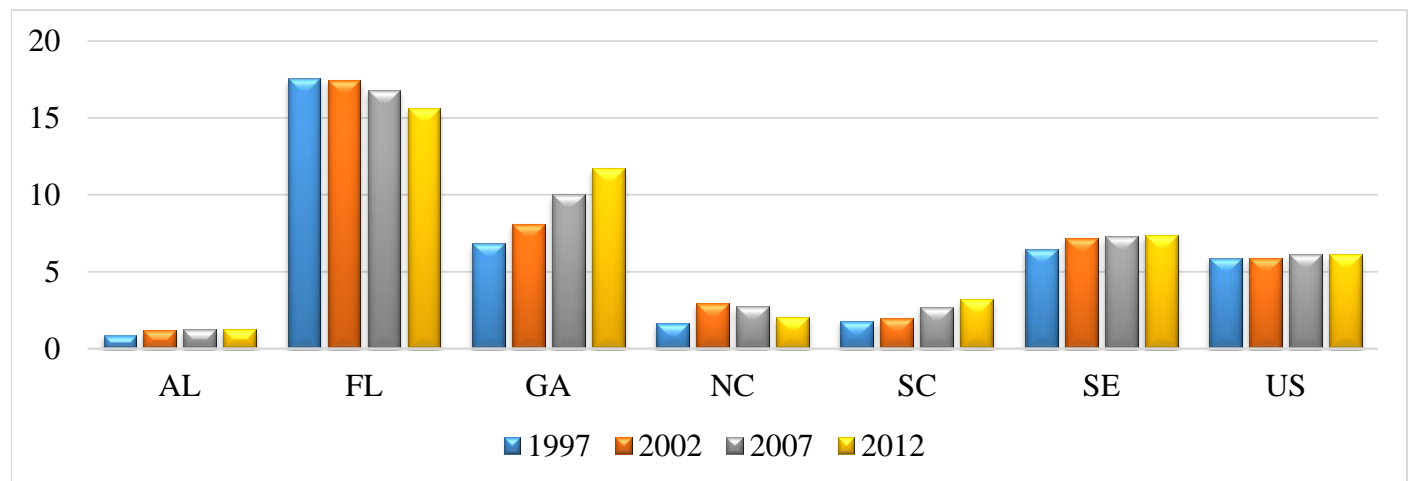
Table 1: Irrigated Area, Land of Farms that Irrigate, All Farmland by State(s), 1997-2012

	Type of Area (ac.)	1997 ¹	2002 ¹	2007 ²	2012 ²
AL	Irrigated Farm Land	79,647	108,783	112,819	113,008
	Land of Farms that Irrigate	468,865	634,369	751,005	692,630
	All Farm Land	9,517,377	8,904,387	9,033,537	8,902,654
FL	Irrigated Farm Land	1,873,823	1,815,174	1,552,118	1,493,320
	Land of Farms that Irrigate	4,581,105	4,709,504	4,116,545	4,076,675
	All Farm Land	10,659,777	10,414,877	9,231,570	9,548,342
GA	Irrigated Farm Land	773,066	870,810	1,017,773	1,125,355
	Land of Farms that Irrigate	2,791,628	3,076,482	3,439,646	3,413,743
	All Farm Land	11,262,838	10,744,239	10,150,539	9,620,836
NC	Irrigated Farm Land	156,315	264,057	232,075	174,526
	Land of Farms that Irrigate	1,475,836	2,086,433	1,706,053	1,420,621
	All Farm Land	9,444,867	9,079,001	8,474,671	8,414,756
SC	Irrigated Farm Land	88,898	95,642	132,439	159,239
	Land of Farms that Irrigate	509,201	634,367	777,695	807,926
	All Farm Land	4,974,138	4,845,923	4,889,339	4,971,244
SE	Irrigated Farm Land	2,971,749	3,154,466	3,047,224	3,065,448
	Land of Farms that Irrigate	9,826,635	11,141,155	10,790,944	10,411,595
	All Farm Land	45,858,997	43,988,427	41,779,656	41,457,832
US	Irrigated Farm Land	56,289,172	55,311,236	56,599,305	55,822,231
	Land of Farms that Irrigate	238,268,128	243,442,396	231,003,205	221,096,951
	All Farm Land	954,752,502	938,279,056	922,095,840	914,527,657

¹ Tables 8 and 10 of Ch. 2: State Data, 2002 Census of Agriculture (pp. 291-297 and 318-324)

² Tables 8 and 10 of Ch. 2: State Data, 2012 Census of Agriculture (pp. 308-314 and 332-338)

Figure 1b: Irrigated Share (Percentage) of All Farm Land¹



¹ $100 \times (\text{Irrigated Farm Land}) / (\text{All Farm Land})$

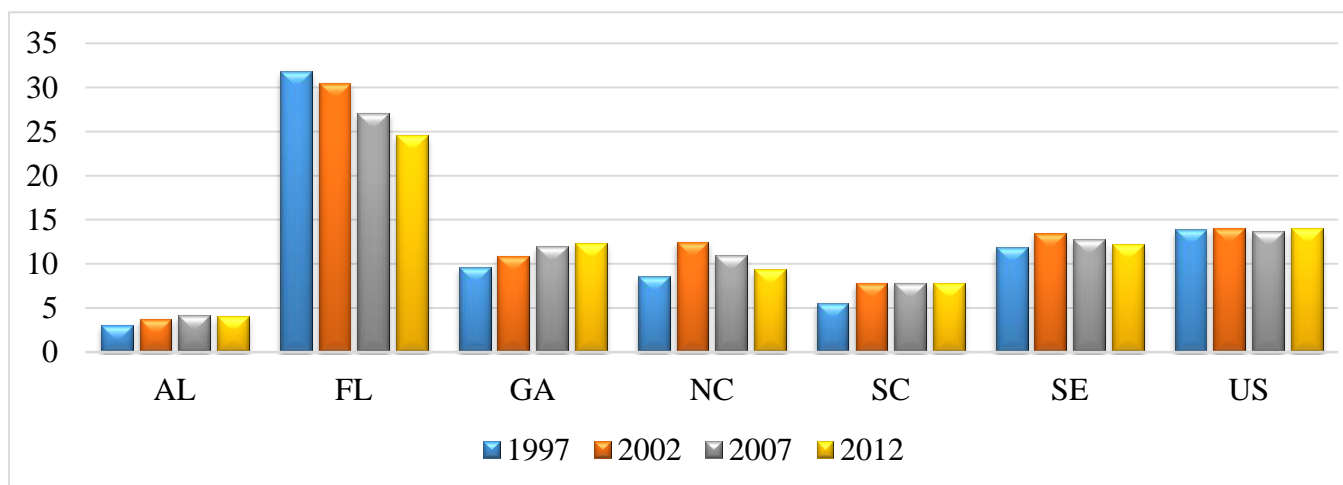
Table 2: Number of Farms with Irrigated Land and All Farms by State(s), 1997-2012

	Type of Farm (no.) or Share (%)	1997 ¹	2002 ¹	2007 ²	2012 ²
AL	All Farms	49,872	45,126	48,753	43,223
	Irrigating Farms	1,503	1,698	2,035	1,747
	Share of Irrigating Farms	3.01	3.76	4.17	4.04
FL	All Farms	45,808	44,081	47,463	47,740
	Irrigating Farms	14,573	13,456	12,868	11,744
	Share of Irrigating Farms	31.8	30.5	27.1	24.6
GA	All Farms	49,343	49,311	47,846	42,257
	Irrigating Farms	4,752	5,369	5,716	5,230
	Share of Irrigating Farms	9.63	10.9	11.9	12.4
NC	All Farms	59,120	53,930	52,913	50,218
	Irrigating Farms	5,059	6,721	5,788	4,699
	Share of Irrigating Farms	8.56	12.5	10.9	9.36
SC	All Farms	25,807	24,541	25,867	25,266
	Irrigating Farms	1,435	1,918	2,030	1,973
	Share of Irrigating Farms	5.56	7.82	7.85	7.81
SE	All Farms	229,950	216,989	222,842	208,704
	Irrigating Farms	27,322	29,162	28,437	25,393
	Share of Irrigating Farms	11.9	13.4	12.8	12.2
US	All Farms	2,215,876	2,128,982	2,204,792	2,109,303
	Irrigating Farms	308,818	299,583	301,028	296,303
	Share of Irrigating Farms	13.9	14.1	13.7	14.0

¹ Table 1 of Chapter 2: State Data in the 2002 Census of Agriculture (pp. 227-233)

² Table 1 of Chapter 2: State Data in the 2012 Census of Agriculture (pp. 245-251)

Figure 2: Share (Percentage) of Farms that Irrigate¹



¹ $100 \times (\text{Irrigating Farms}) / (\text{All Farms})$

Five-State, Southeast Region and the United States

Irrigation did not spread in the Southeast (SE) from 2002 because of its contraction in Florida.

Irrigated area decreased 2.8 percent from 2002 to 2012 (Table 1), but the contraction did not necessarily mean that the amount of water applied also decreased. The irrigated share of land in irrigating farms in

the region decreased from 1997 to 2007 and was lower in 2012 than in 1997 (Figure 1a). The irrigated share of land in all southeastern farms increased in each Census from 1997 to 2012 (Figure 1b). The irrigated shares of land in irrigating farms and all farms in the region exceeded the respective shares in the U.S. in each Census from 1997 (Figure 1a and 1b).

The number and proportion of irrigating farms in the Southeast declined after 2002, although the proportion was slightly larger in 2012 than in 1997 (Table 2 and Figure 2). The proportion of irrigating farms was slightly less in the Southeast than in the U.S. from 1997 to 2012.

Irrigation changed even less between 1997 and 2012 in the United States (US) than the Southeast.

Irrigated area decreased 0.8 percent from 1997 to 2012 (Table 1). The irrigated shares of land in irrigating farms and in all farms were only 1.6 and 0.2 percentage points higher in 2012 than 1997 (Figure 1a and 1b). The number of farms that irrigated declined but the proportion that irrigated slightly increased, 0.2 percentage points, in the US over the 15-year period (Table 2 and Figure 2).

The lack of expansion in the Southeast and elsewhere from 2002 to 2012 might not have continued. The extent of irrigation depends on its profitability.

References

- Census Bureau 1962. Summary Table 1. *U.S. Census of Agriculture: 1959, Final Report – Volume 3, Irrigation of Agricultural Lands*. Bureau of the Census, U.S. Dept. of Commerce, Washington DC, October. <http://usda.mannlib.cornell.edu/usda/AgCensusImages/1959/03/01/935/Table-01.pdf>
- NASS 2004. *2002 Census of Agriculture, United States: Summary and State Data, Volume 1, Geographic Area Series, Part 51, AC-02-A-51*. National Agricultural Statistics Service, U.S. Dept. of Agriculture, Washington DC, June. www.agcensus.usda.gov/Publications/2002/Volume_1_Chapter_2_US_State_Level/USVolume104.pdf
- NASS 2014. *2012 Census of Agriculture, United States: Summary and State Data, Vol. 1, Geographic Area Series, Part 51, AC-12-A-51*. National Agricultural Statistics Service, U.S. Dept. of Agriculture, Washington DC, May. www.agcensus.usda.gov/Publications/2012/Full_Report/Volume_1_Chapter_2_US_State_Level/usv1.pdf

Authors

Scott R. Templeton (Associate Professor), Courtney Jackson (former Graduate Research Assistant) and Mahjuja Taznin (Graduate Research Assistant), John E. Walker Dept. of Economics, Clemson University; Jose Payero (Irrigation Specialist), Edisto Research and Education Center, Clemson University; and Daniel Dourte (former Extension and Research Associate), Dept. of Agricultural and Biological Engineering, University of Florida.

