

Economic Implications of Drought Management for Southwest Georgia Agriculture

***USDA-CSREES National
Water Conference***

***Sparks, NV
February 6, 2008***

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Topics for Consideration

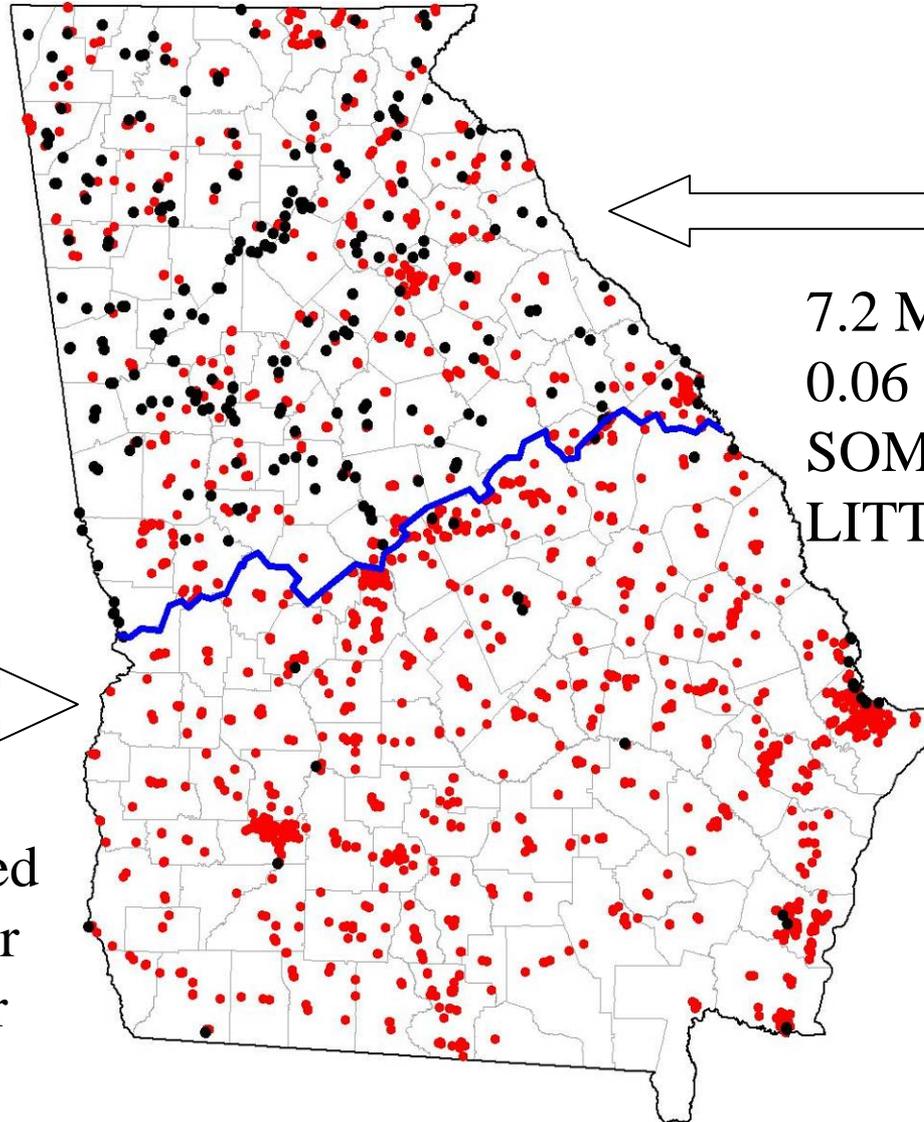
- Immediate Concerns:
 - 2007 Drought Conditions
 - US Fish & Wildlife Critical Habitat Designation
 - Flint River Drought Protection Act
- Economic Impacts of Management Scenarios (revised)
- What is happening with the State Water Plan and how will that impact SW GA?

State	2005 Population Estimate	1970 Census	Numeric Change	Percent Change	Irrigated Acreage USGS 2000
Alabama	4,557,808	3,444,354	1,113,454	32%	70,000
Florida	17,789,864	6,791,418	10,998,446	162%	2,060,000
Georgia	9,072,576	4,587,930	4,484,646	98%	1,540,000
Kentucky	4,173,405	3,220,711	952,694	30%	66,600
Louisiana	4,523,628	3,644,637	878,991	24%	940,000
Mississippi	2,921,088	2,216,994	704,094	32%	1,420,000
North Carolina	8,683,242	5,084,411	3,598,831	71%	196,000
South Carolina	4,255,083	2,590,713	1,664,370	64%	187,000
Tennessee	5,962,959	3,926,018	2,036,941	52%	60,500



Water Users and Water

- Municipal & Industrial Surface Water Withdrawals
- Municipal & Industrial Groundwater Withdrawals



7.2 M people
0.06 M acres irrigated
SOME surface water
LITTLE groundwater

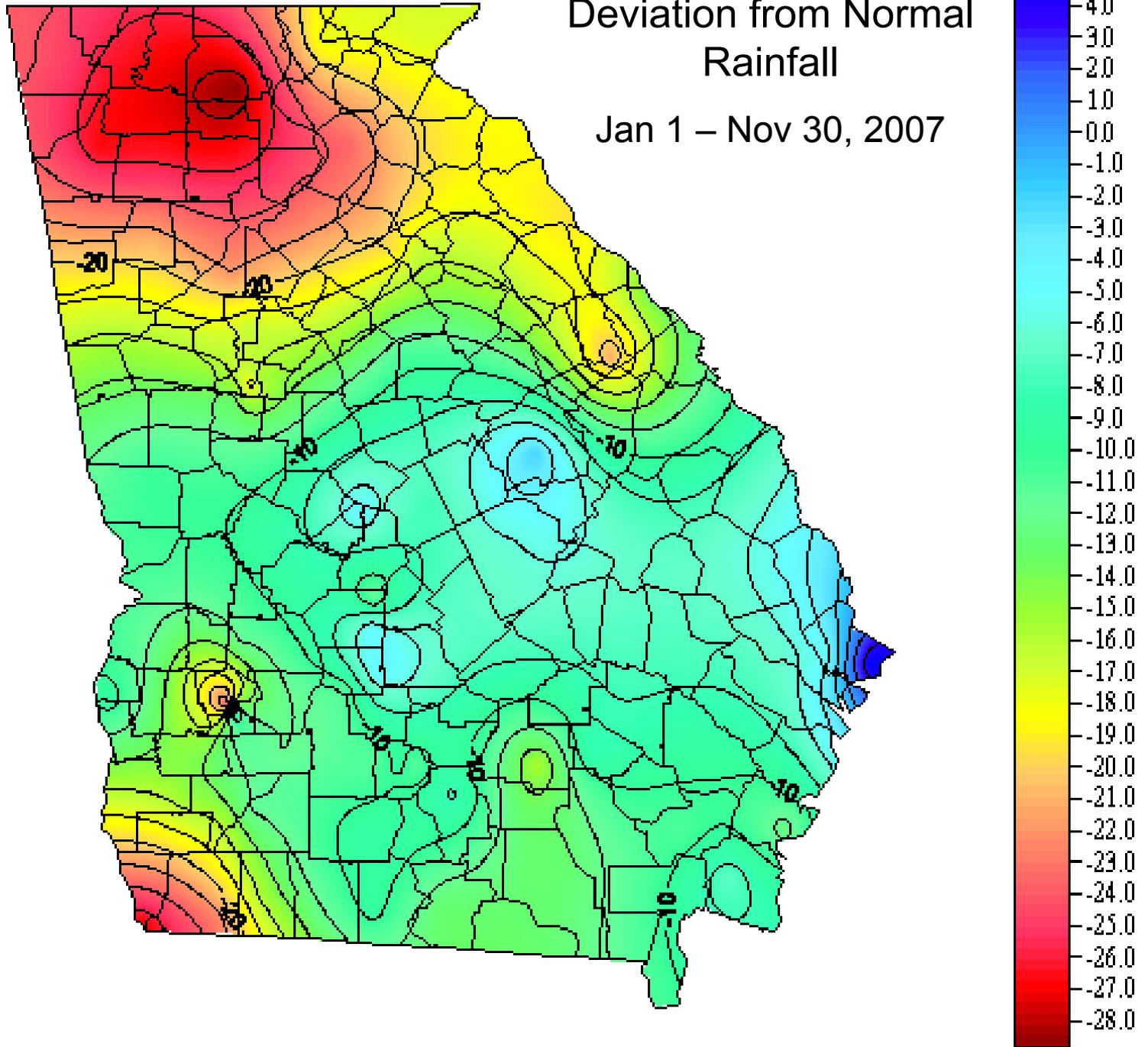
1.9 M people
1.54 M acres irrigated
MORE surface water
MUCH groundwater

Drought and Immediate Concerns for SW Georgia

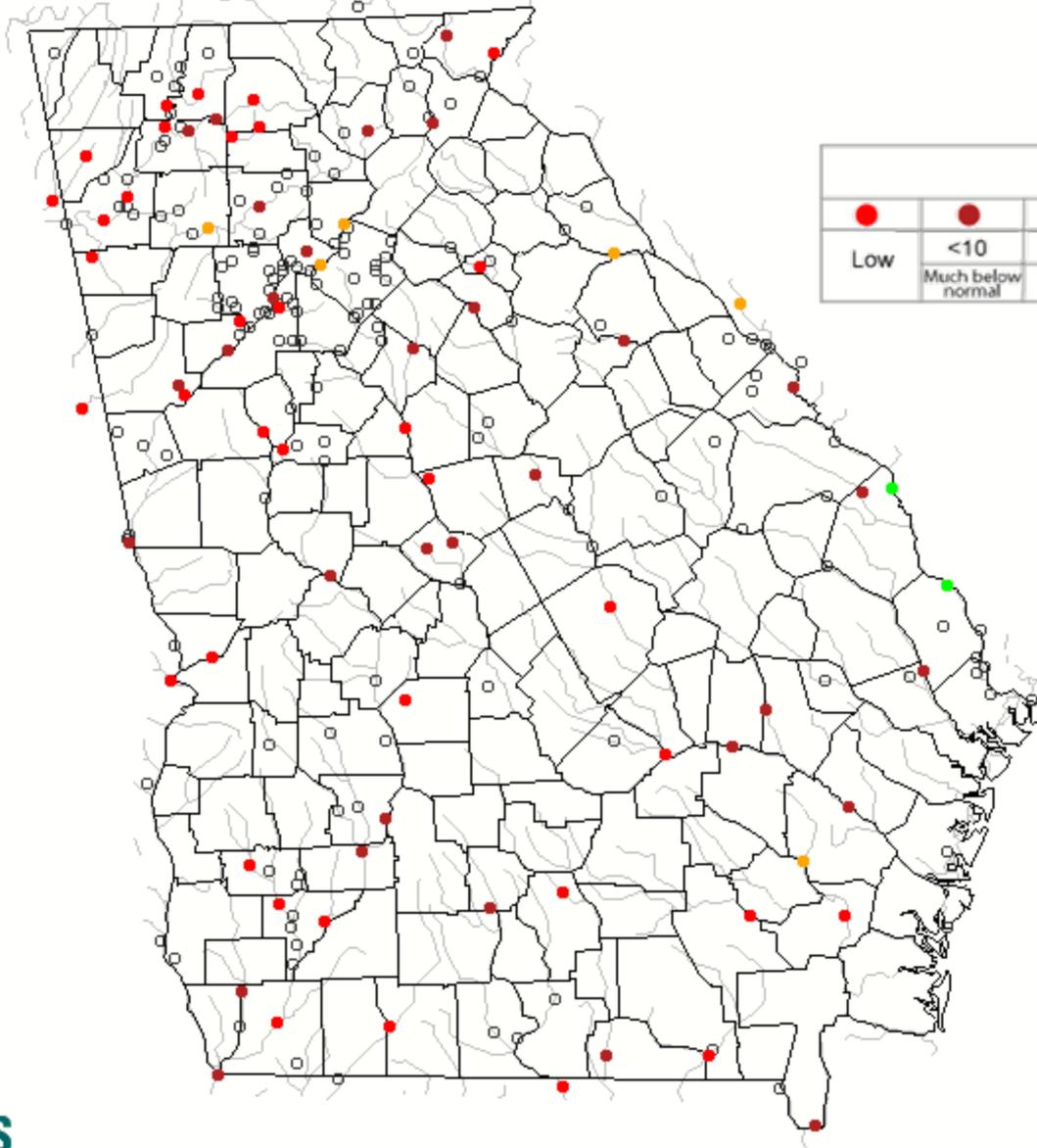


Deviation from Normal Rainfall

Jan 1 – Nov 30, 2007

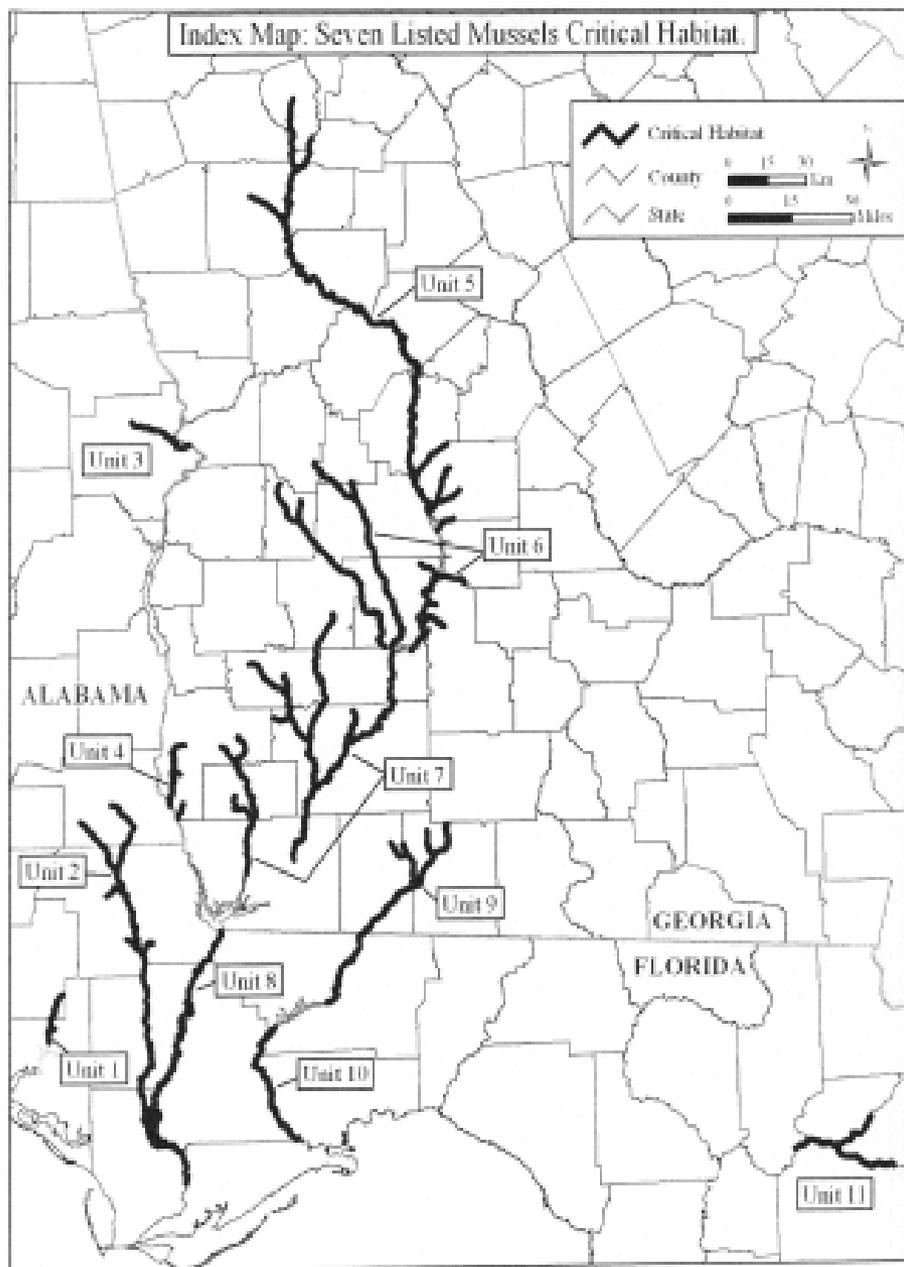


Tuesday, May 22, 2007 10:06ET



Explanation - Percentile classes							
Low	<10 Much below normal	10-24 Below normal	25-75 Normal	76-90 Above normal	>90 Much above normal	High	Not-ranked

Index Map: Seven Listed Mussels Critical Habitat.



U.S. Fish & Wildlife Service

Endangered and Threatened Mussels in the Apalachicola-Chattahoochee-Flint Basin



Fat threeridge



Purple banklimber



Chipola slabshell



Shinyrayed pocketbook



Gulf moosshell



Oval pigtoe

They make no sound. They cannot see. Some may live for decades, but seldom move from a secure spot. Yet, freshwater mussels are causing a stir; becoming noticed and making us ponder their future as we make plans for our own.

Mussels are in trouble. No other country in the world equals the United States in freshwater mussel variety. While all of Europe supports only 12 species, nearly 800 kinds live here. It's estimated that 70% of our freshwater mussels are extinct, endangered, or in need of special protection. In the Apalachicola Region, three species have already been declared extinct, seven have been federally protected under the Endangered Species Act, and six more are proposed as candidates for federal protection. Many of their problems stem from how they live and changes that have occurred to their habitat during the past 200 years.

Why are freshwater mussels so imperiled?

Our native freshwater mussels face greater problems today than they did just a few years ago. Some problems aren't new. Although water quality has improved in some areas, pollution, especially non-point source pollution, causes the greatest threat to native mussels. Also sedimentation continues to take a serious toll. Habitat losses through channelization, clearing of riparian and streambank vegetation, dredging, and dam construction still persist. Mussels are impacted by loss of fish hosts from fish kills or dams that prevent fish migration. Poachers can impact mussels by violating harvest regulations set by conservation agencies. However, in some parts of the country, it's a non-native mussel causing the most concern.

Freshwater Mussel Facts**Common and scientific names:**

Fat threeridge mussel (*Anodonta nitens*), Shinyrayed pocketbook (*Lamprolaima fulvipes*), Gulf moosshell (*Meliodonta penicillata*), Oval pigtoe (*Pleurobema pyriforme*), Chipola slabshell (*Lamprolaima chipolensis*), and Purple banklimber (*Ellipsostoma floridanum*).

States: All six mussels were listed on March 16, 1998.

Descriptions: Mussels are bivalve mollusks, which means they have two valves (shells) surrounding a soft fleshy body. Fresh water mussels are related to snails, oysters, clams and squids.

Habitat: Mussels live in the sand and gravel bottoms of streams and rivers. They require good water quality, stable stream channels and flowing water.

Diet: Mussels filter their food out of the water. They eat algae, other small plants and animals and possibly bacteria that grow on pieces of plant debris.

Life history: The larvae of these mussels are parasites on the gills and fins of freshwater fishes, including darters, minnows and bass. The larvae use the host fish for dispersal and cause them little to no harm. Many mussels use lures that mimic minnows, worms, leeches or aquatic insects to attract a suitable fish host.

Natural predators: Some species of fishes and turtles, as well as muskrats, raccoons, and otters feed on mussels.

Threats to survival: Habitat modification through manmade structures like dams and channel alterations has destroyed free-flowing water habitats. These modifications restrict mussels and fish from dispersing which results in small, isolated populations. In addition to habitat modifications, mussel populations are exposed to point source pollution and nonpoint source pollution such as toxic runoff containing fertilizers, herbicides and pesticides from land-use practices.

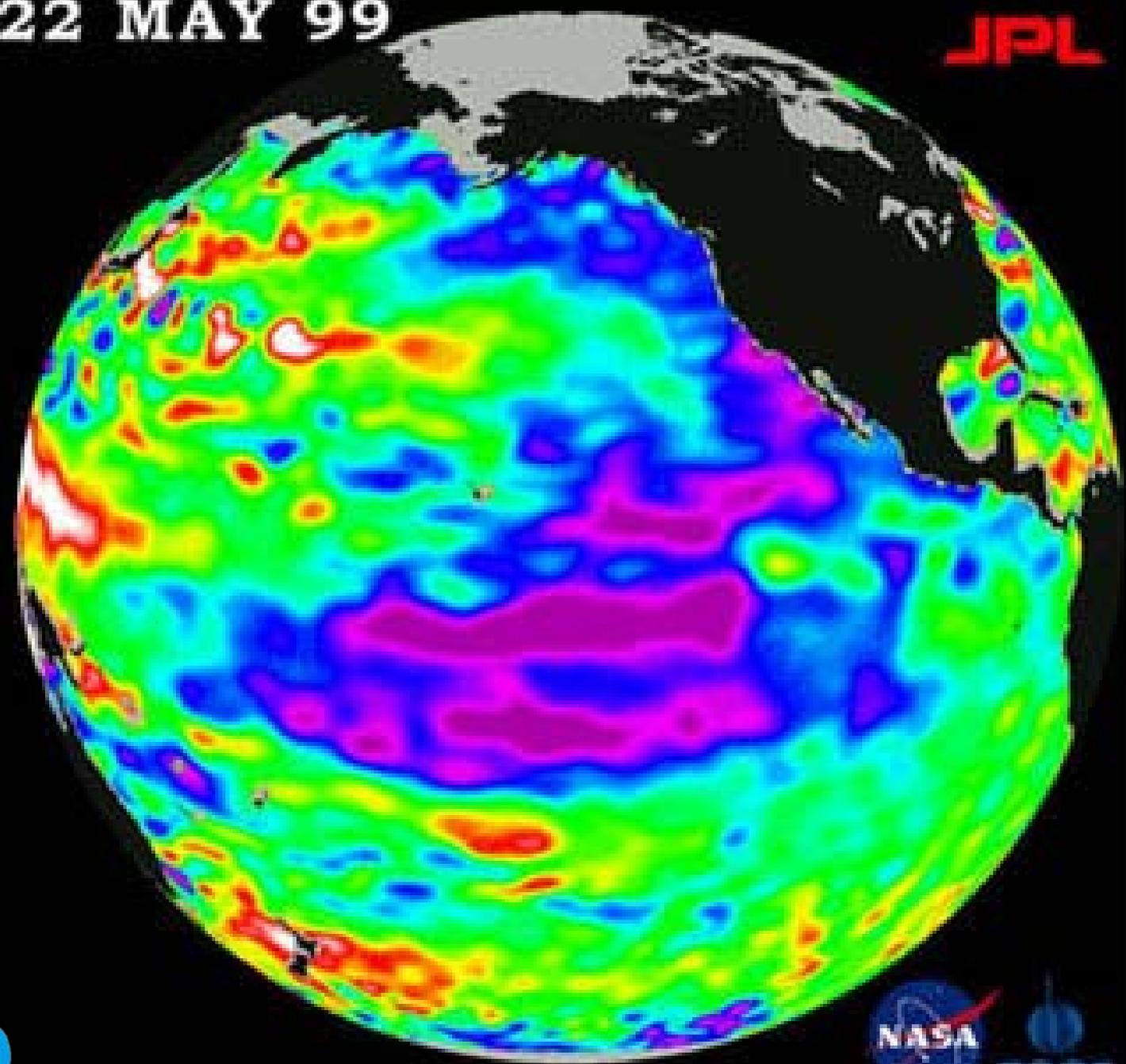


Critical Habitat



22 MAY 99

JPL

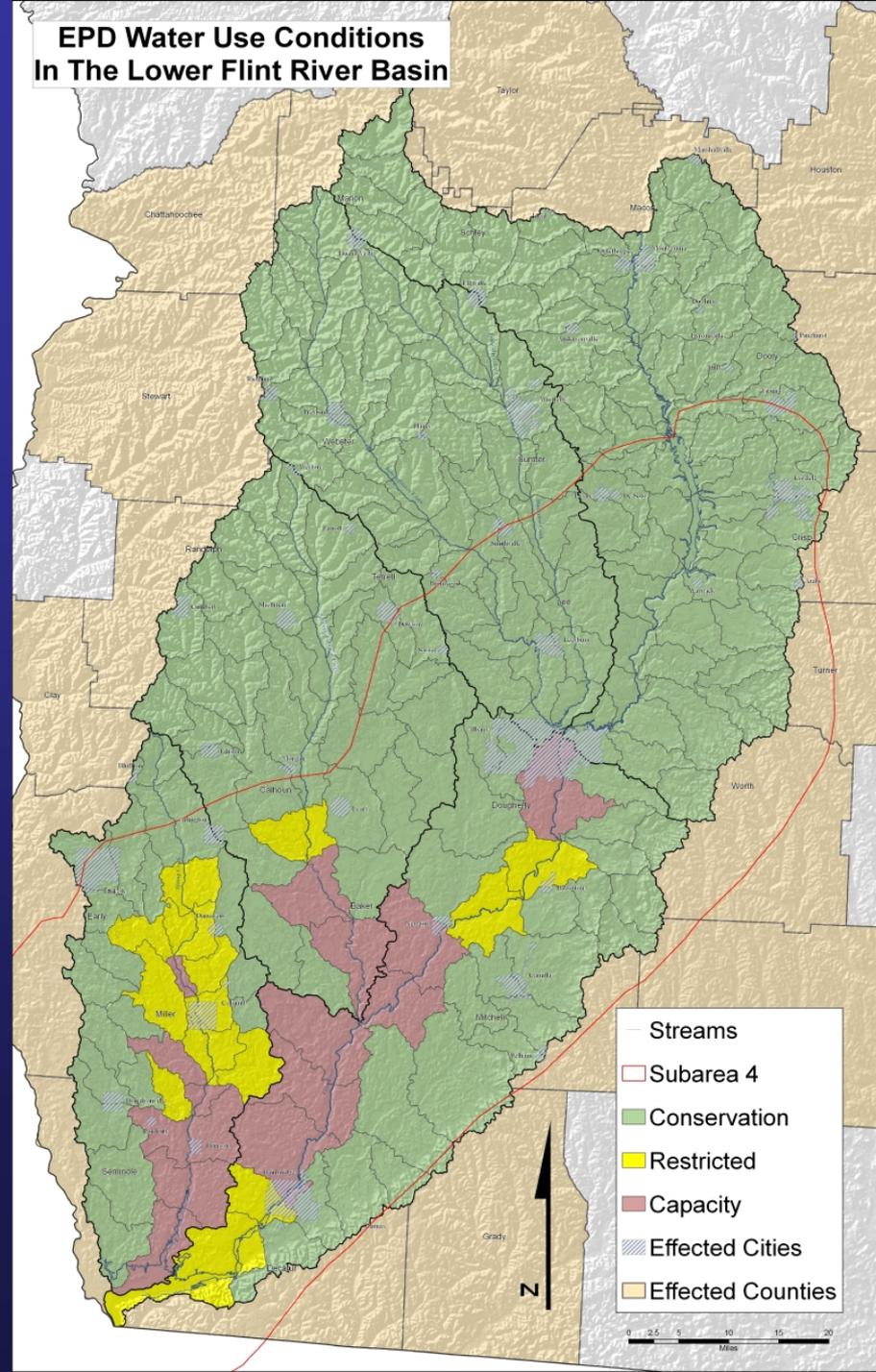


Flint River Drought Protection Act



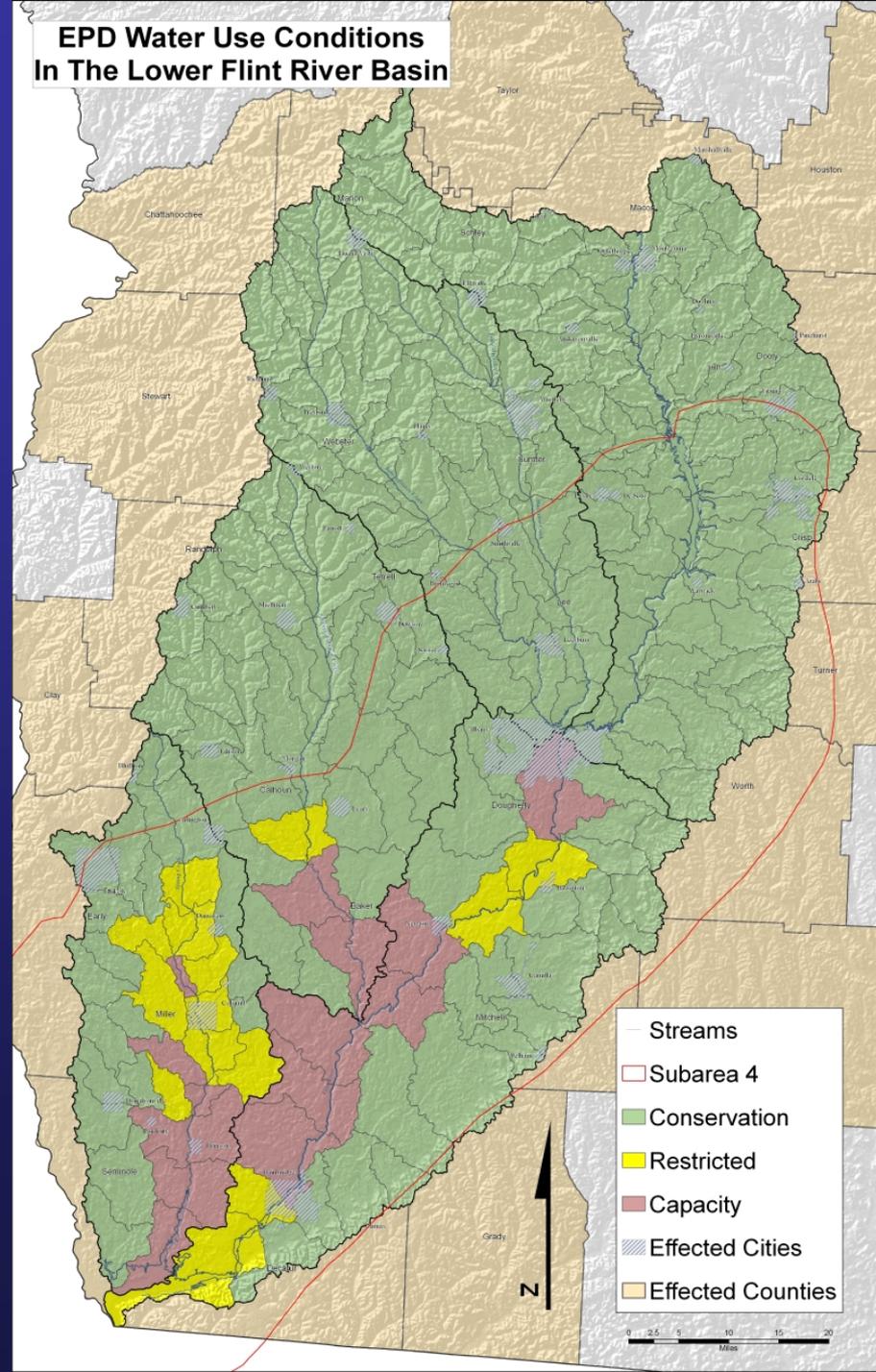
Flint River Drought Protection Act

- Inaugural auction held March 15, 2001
 - 33,101 acres retired from irrigated production
 - Average bid: \$136/acre
 - \$4.5 million paid to growers
- Auction held again in 2002
 - 40,894 acres retired
 - Average bid: \$128/acre
 - \$5.2 million paid to growers
- Major changes for Act after Flint River Water Dev. and Conservation Plan passed March 2006



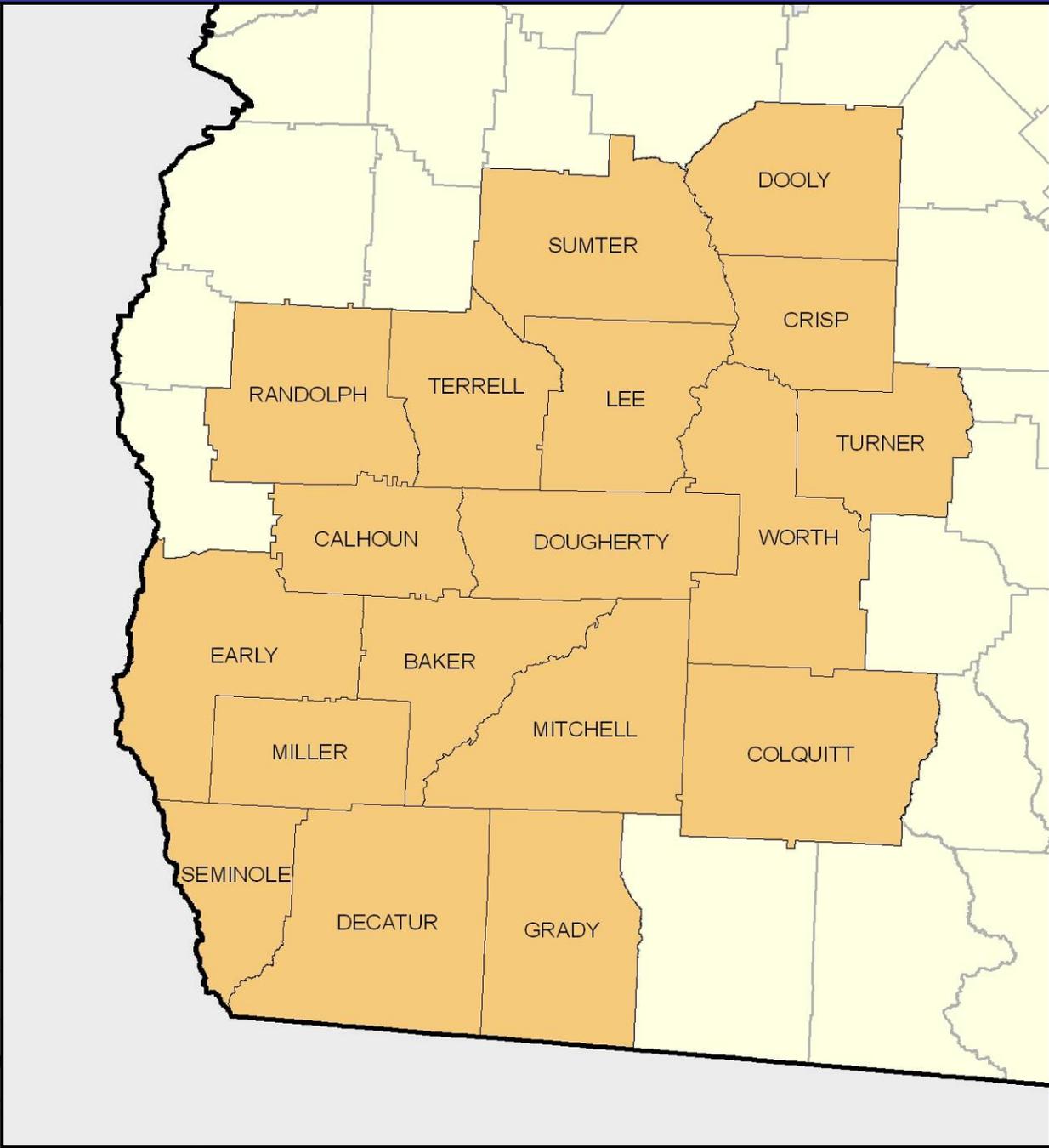
Flint River Drought Protection Act

- Designation of different “use” areas
- Ground water now eligible for participation
- Act may be targeted on smaller watersheds
- “Partial” buyout of an agricultural permit
- Involuntary suspension provisions



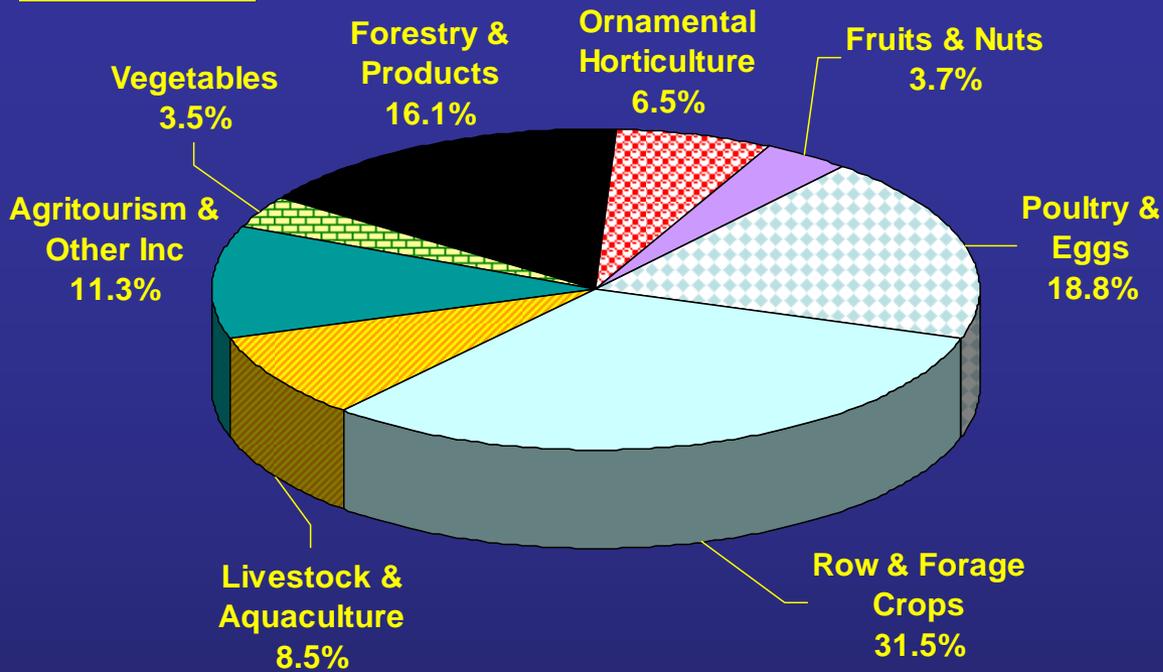
Outline

- What is the economic impact of agriculture to the Lower Flint River Basin and SW GA as a whole?
 - Farm gate, direct and indirect output/employment
- What are the potential impacts of reducing irrigated acreage in Spring Creek and Ichaway sub-basins?
 - Scenarios from GA EPD surface water models
 - Assumptions
 - Irrigation and yield data
 - Basin and region level
- Revised scenario

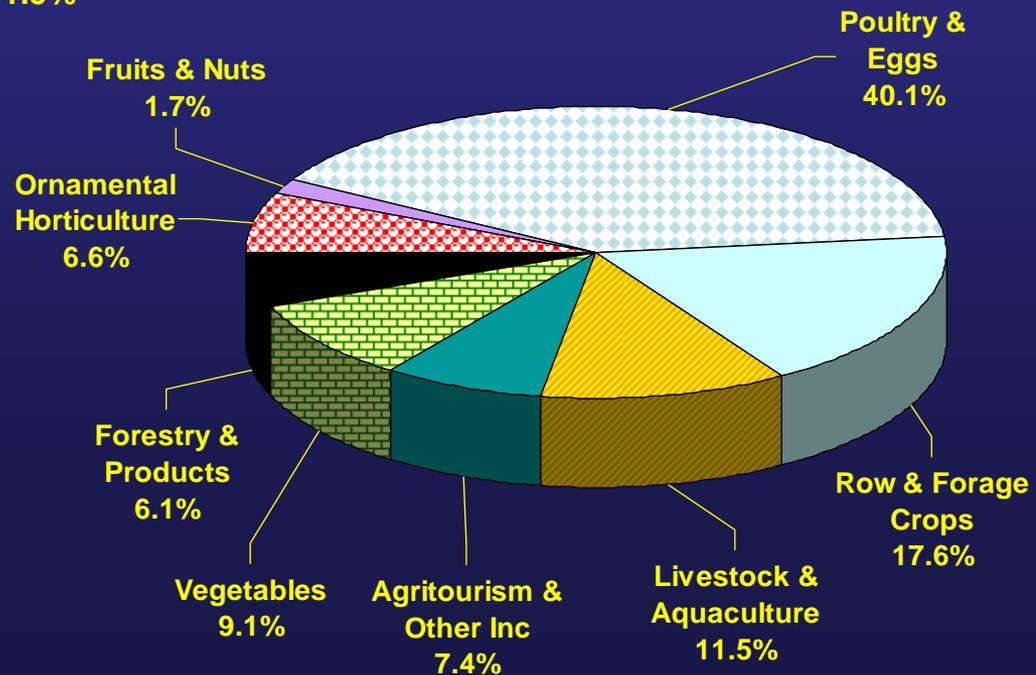


Farm Gate Value Commodity Groups: 2006

Flint River

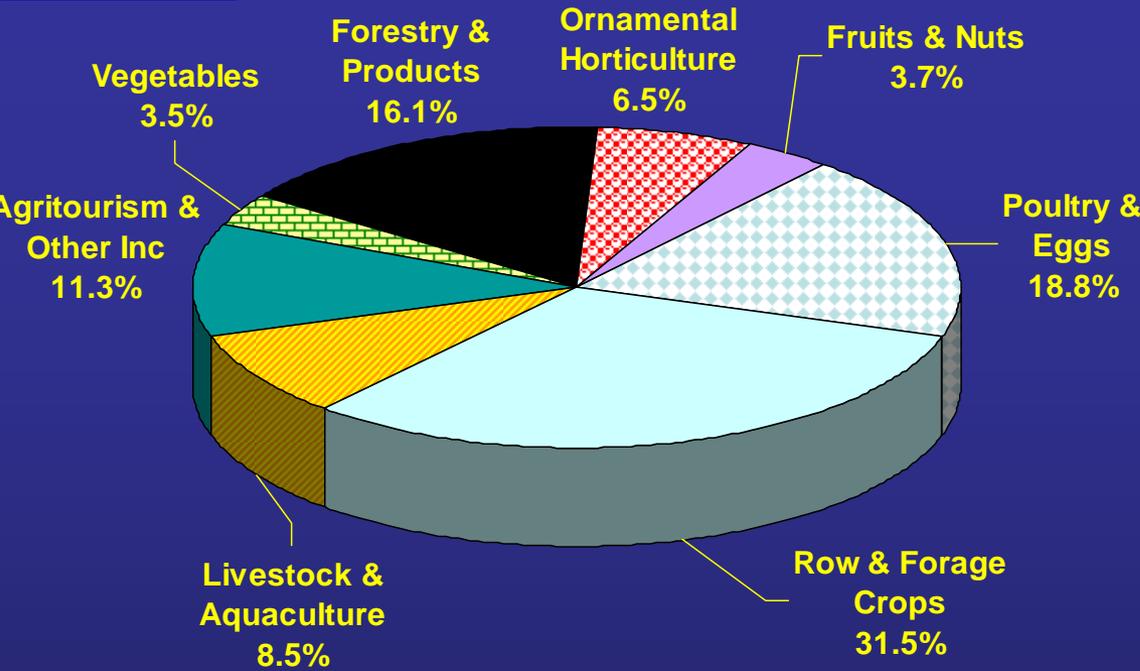


Georgia



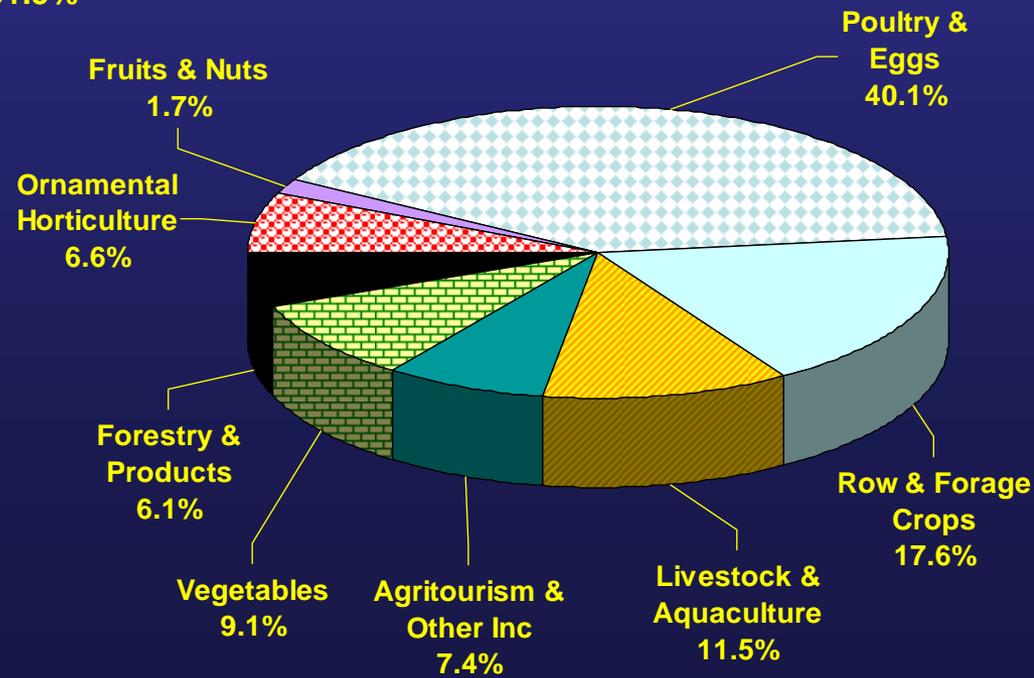
Farm Gate Value
 Flint = \$1.98 billion
 GA = \$10.4 billion

Flint River



2007 Drought Impacts
Flint: \$250-320 million
Georgia: \$785 million

Georgia

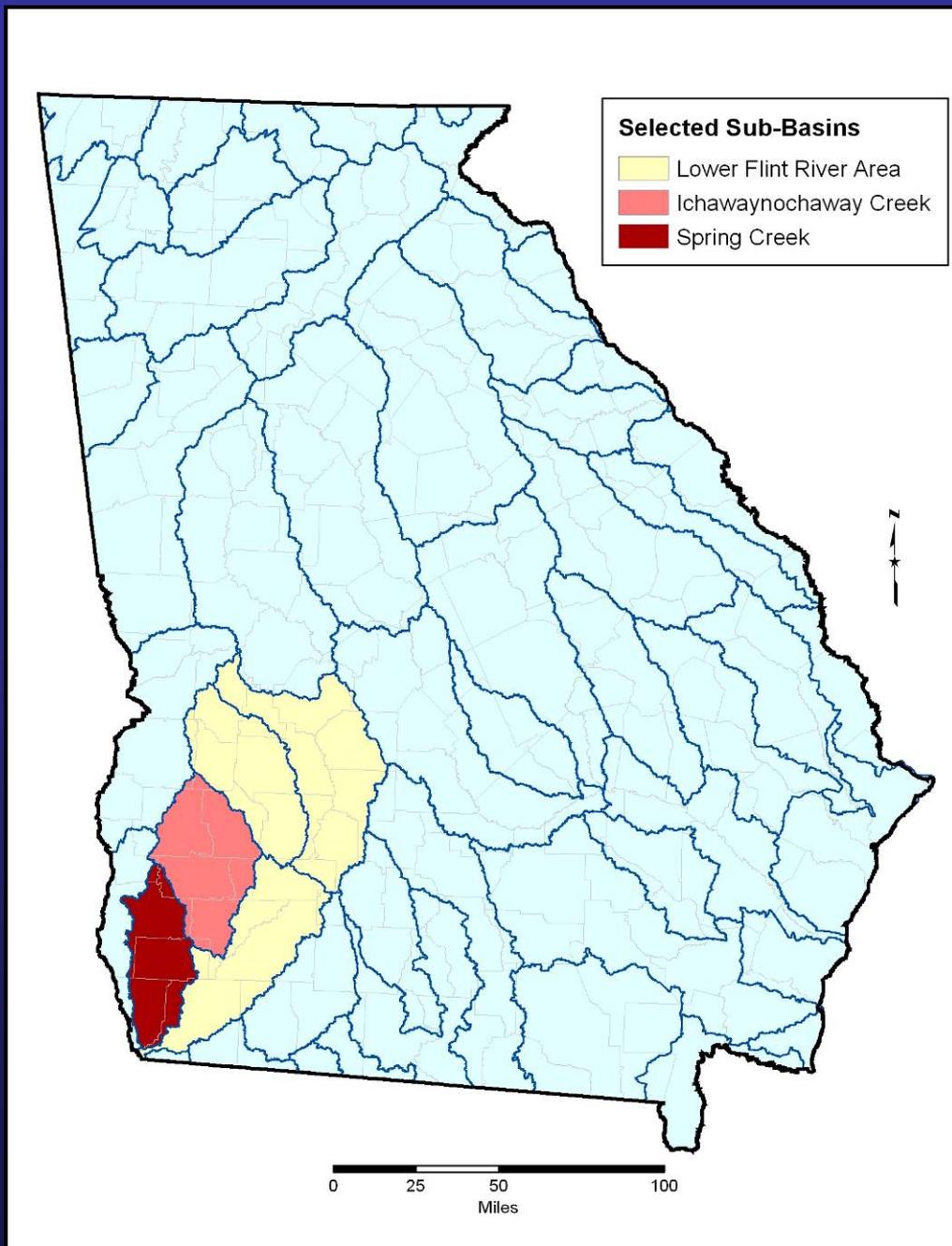


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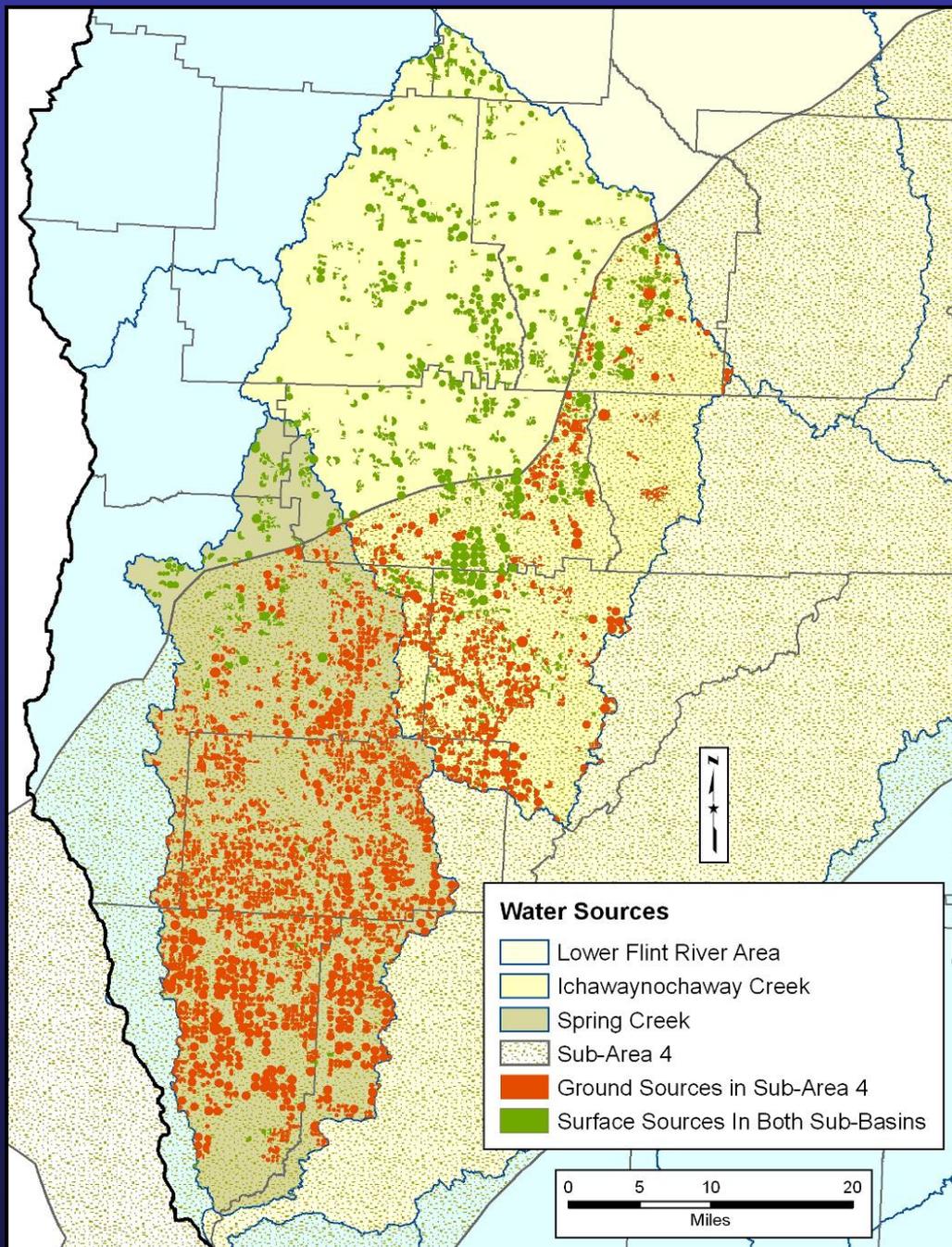
Flint River Basin

Agriculture and Directly Related Businesses *IMPACT*

	Direct \$ (millions)	Indirect \$ (millions)
Agriculture + Direct	3,748.511	495.772
Mining	0	60.428
Construction	0	0.190
Manufacturing	0	908.303
Utilities	0	54.167
Trade	0	51.128
Fin / Ins / Real Est	0	17.545
Services	0	173.275
Government	0	232.915
Other	0	64.155
Total	\$5.8 Billion	– 34.45% of total economy



- Concentration of modeling efforts in Ichaway and Spring Creek Sub-basins.
- EPD surface water models indicate low-flow violations under some conditions
 - Especially Spring Crk
- 326,204 permitted irrigated acres in these two basins
 - 153,263 (Ichaway)
 - 172,941 (Spring)
 - \approx 62% of harvested land



- This analysis was limited to all surface water w/drawals and those ground water w/drawals out of the Upper Floridan as determined by EPD
- This amounts to roughly 241,000 irrigated acres
 - 100,890 in Ichaway
 - 140,130 in Spring
- Ichaway region includes Terrell, Randolph, Calhoun, and Baker Counties
- Spring Creek region includes Early, Miller, Seminole, and Decatur counties

Impact Model

- IMPLAN

- IMImpact analysis for PLANning
- Input–Output model describing commodity flows from producers to final consumers
- Driven by purchases for final use or final demand (in our case, lost revenue from not irrigating)
 - Direct effects
 - Indirect Effects
 - Multipliers
- Region specific
 - Base model (2002) or modified

Acreage Reduction by Crop

	Baseline	20%	30%	40%	Bklg.
<i>Ichaway</i>	100,890	-20,178	-30,267	-40,356	+16,517
Peanut		-6,053	-9,080	-12,107	+4,955
Cotton		-9,080	-13,620	-18,160	+7,433
Corn		-5,044	-7,567	-10,089	+4,129
<i>Spring</i>	140,130	-28,026	-42,039	-56,052	+17,255
Peanut		-8,408	-12,612	-16,816	+5,177
Cotton		-12,612	-18,916	-25,223	+7,765
Corn		-7,007	-10,510	-14,103	+4,314

Numbers shown in **RED** were provided by EPD. Peanut, cotton, and corn acreage is roughly 86% of the total irrigated acreage in these two basins. Assume all reduction from these crops w/ the following distribution: PN (35%), CT (50%), CN (15%)

Crop Assumptions

Crop	Irrigated Yield ^a	Non-Irrig Yield	Irrig (ac/in)	\$/unit ^b
Peanut	4820 lb/ac	2760 lb/ac	10.5	\$.19
Cotton	1440 lb/ac	420 lb/ac	11.15	\$.64 ^c
Corn	194bu/ac	87 bu/ac	14.95	\$2.90 ^c

^a Yield and irrigation data collected during CY 2006 from USDA-ARS NPRL Multi-Crop Irrigation Research Farm.

^b 2004 Estimated Georgia Prices compiled by UGA CAES.

^c Includes Loan Deficiency Payment (LDP)

20% Reduction in Irrigated Acreage

	Ichaway Region		Spring Creek Region	
	Output	Employment	Output	Employment
Manufacturing				
Non-Durables	-\$74,086	-0.7	-\$364,286	-1.8
Durables	-\$108,026	-0.6	-\$167,930	-0.8
Non-Manufact.				
Ag Services	-\$738,282	-29.8	-\$1,668,524	-71.5
Mining	\$0	0	-\$4,740	0
Construction	-\$53,054	-1	-\$145,239	-2.1
Trans/Utilities	-\$374,669	-2.7	-\$519,583	-3.6
Ret/Whl Trade	-\$1,046,811	-7.7	-\$1,578,065	-30.2
Fin/Ins/Real Est	-\$796,157	-3.1	-\$1,562,687	-8.3
Services	-\$414,627	-7.3	-\$1,029,382	-17.8
Government	-\$184,349	-1.9	-\$206,966	-2.5
Farm	-\$10,909,152	-105.5	-\$15,083,655	-157.7
TOTAL	-\$14,699,214	-170	-\$22,331,058	-296.5

30% Reduction in Irrigated Acreage

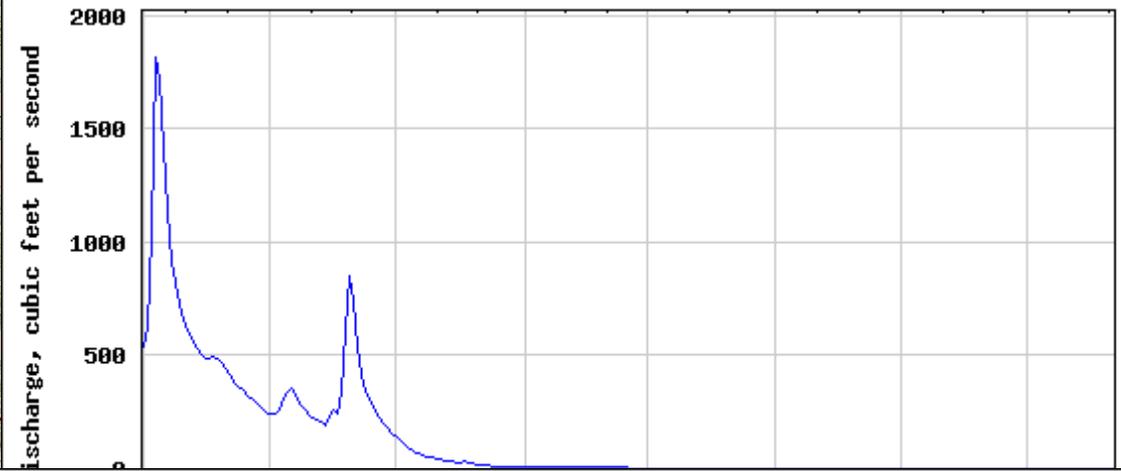
	Ichaway Region		Spring Creek Region	
	Output	Employment	Output	Employment
Manufacturing				
Non-Durables	-\$111,130	-1.1	-\$546,430	-2.7
Durables	-\$162,040	-0.8	-\$251,895	-1.3
Non-Manufact.				
Ag Services	-\$1,107,423	-44.5	-\$2,502,786	-107.3
Mining	\$0	0	-\$7,111	0
Construction	-\$79,581	-1.4	-\$217,859	-3.2
Trans/Utilities	-\$562,003	-4.2	-\$779,375	-5.3
Ret/Whl Trade	-\$1,570,217	-26.5	-\$2,367,098	-45.4
Fin/Ins/Real Est	-\$1,194,235	-4.7	-\$2,344,031	-12.5
Services	-\$621,941	-10.9	-\$1,544,073	-26.7
Government	-\$276,523	-2.8	-\$310,450	-3.8
Farm	-\$16,363,727	-157.6	-\$22,625,485	-236.6
TOTAL	-\$22,048,819	-254	-\$33,496,590	-444.7

“Preliminary indicators are pointing to the likelihood of a drought declaration” ... “Based on the revised statute of the Flint River Drought Protection Act, my recommendation to the Governor will likely be for a targeted approach to Capacity Use Areas.”

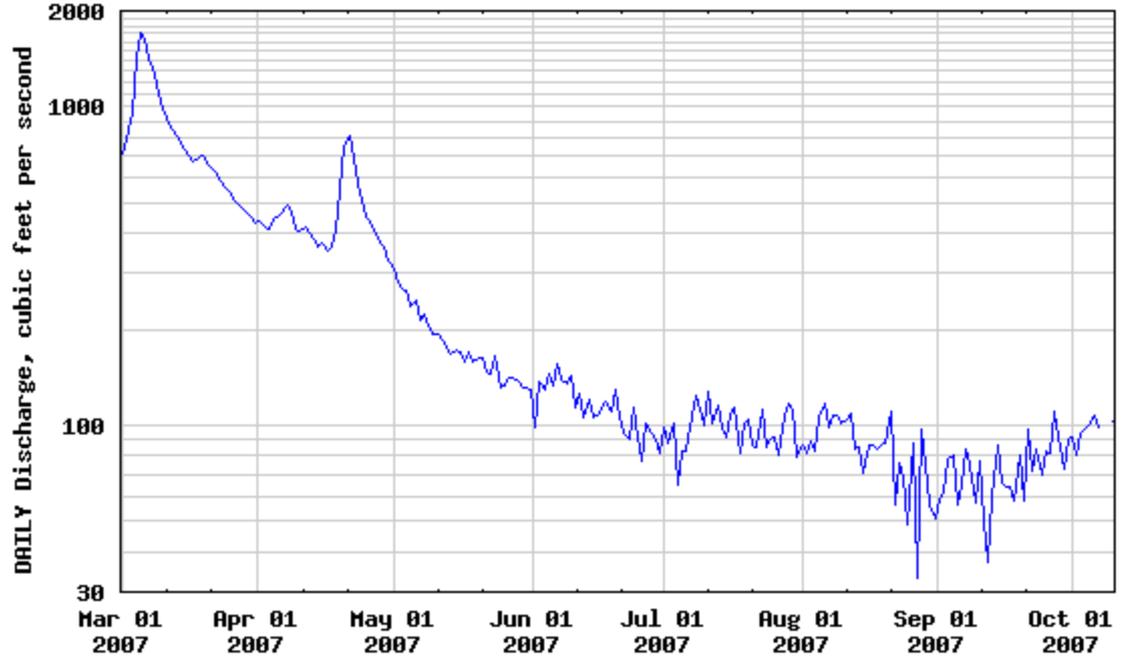
-- Dr. Carol Couch, EPD Director

February 6, 2008

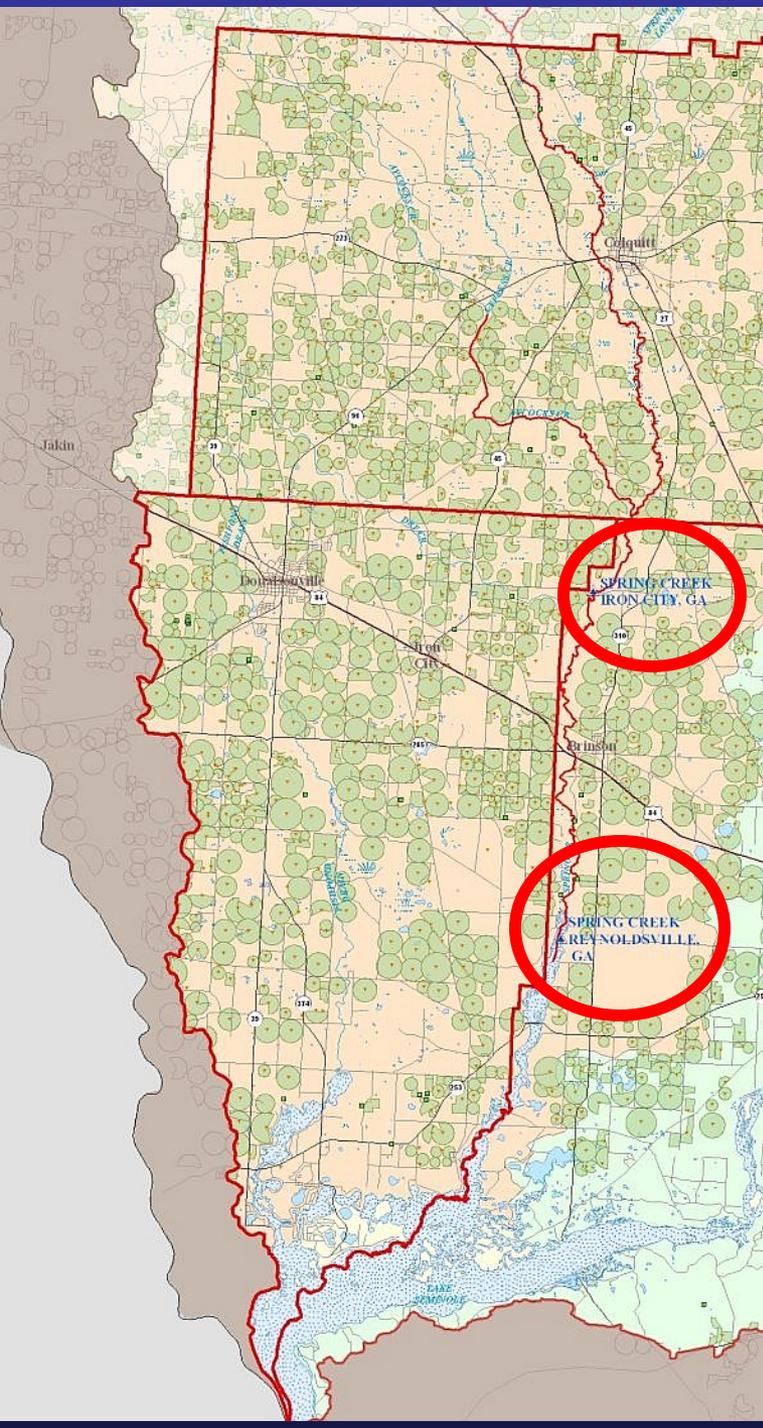
USGS 02357000 SPRING CREEK NEAR IRON CITY, GA



USGS 02357150 SPRING CREEK NEAR REYNOLDSVILLE, GA



----- Provisional Data Subject to Revision -----





Farm Gate Value: \$75.2 million

Permitted Acreage

Cotton (acres): 39,022

75,279 GW – 1,680 SW

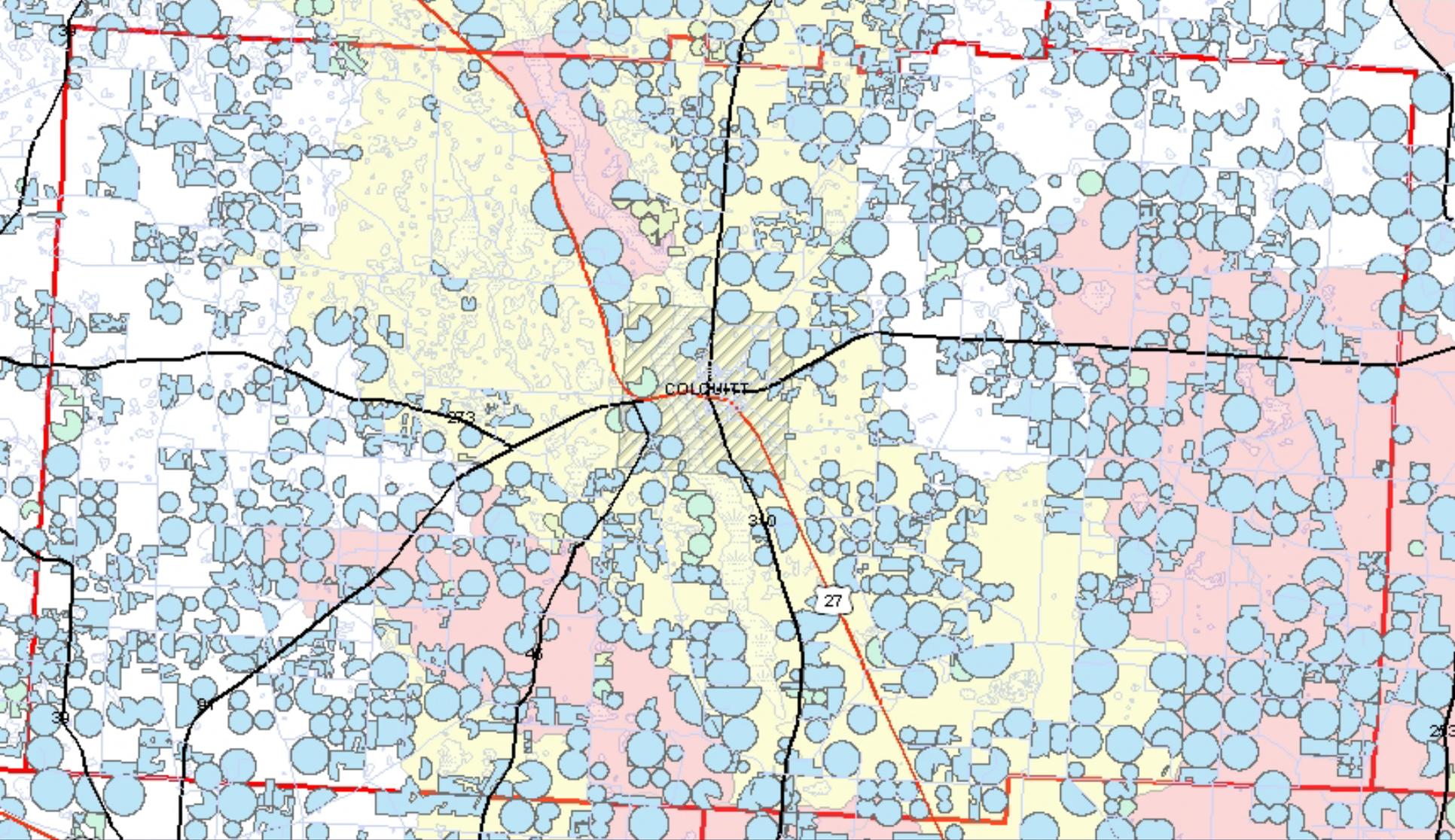
Peanut (acres) 21,744

“Real” Acreage

Corn (acres) 5,064

64,768 GW – 937 SW

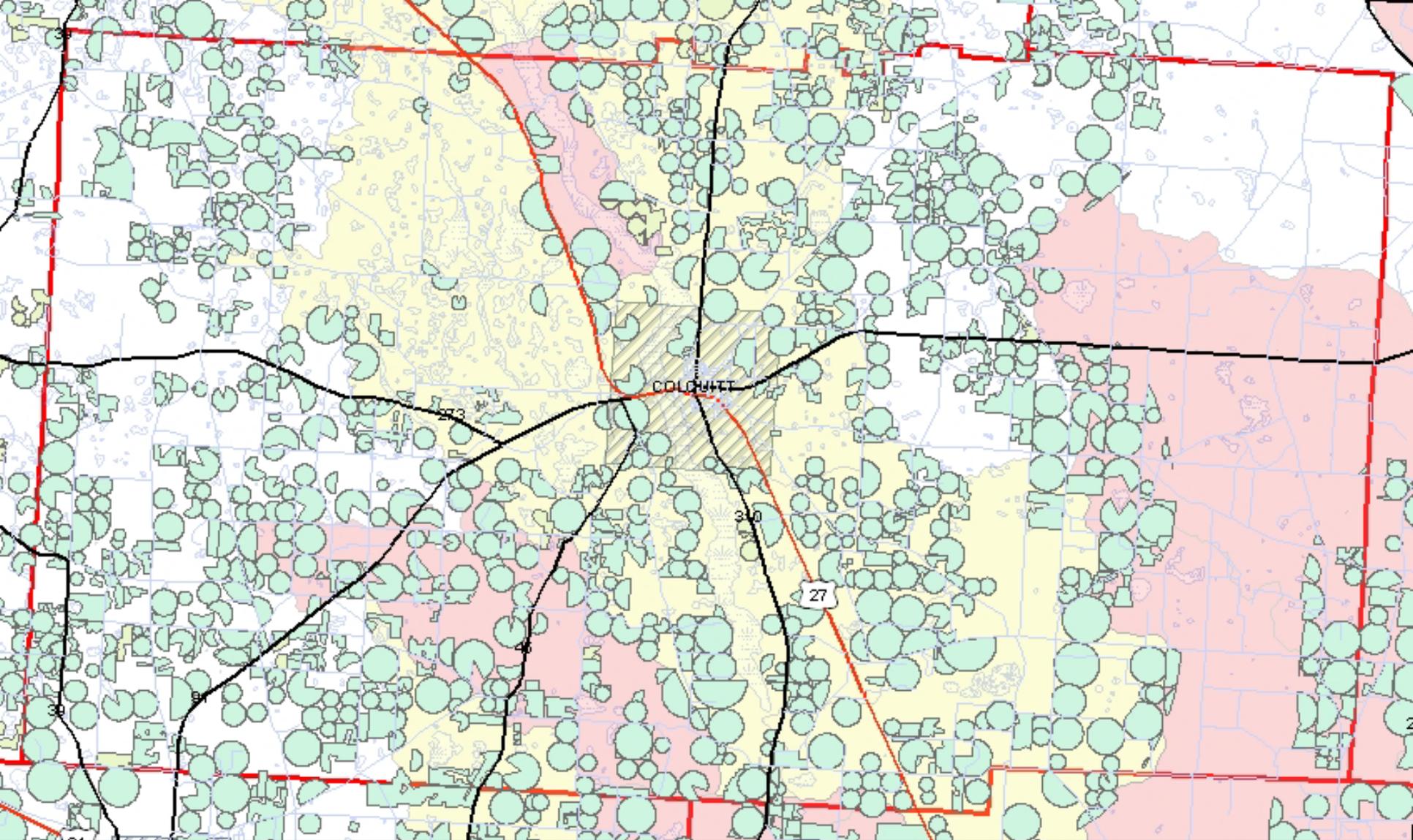




Miller County Total
65,705 Irrigated Acres

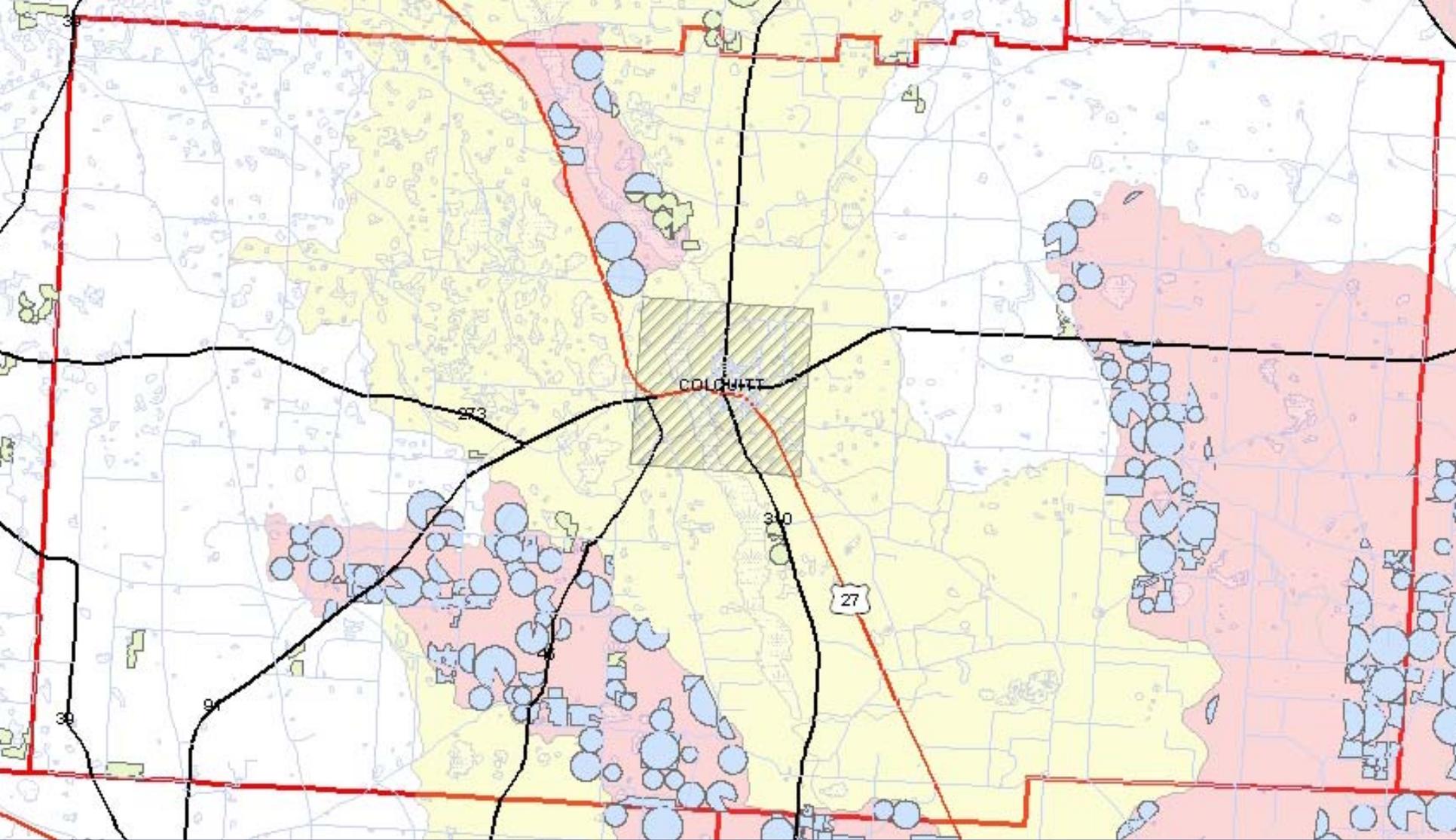
Capacity Use	17,757	27%
Restricted Use	21,151	32%
Consvn Use	26,797	41%





Miller County Total	Capacity Use	10,356	18%
-- Within 3 Miles --	Restricted Use	21,134	35%
59,370 Acres (90%)	Consrvn Use	27,880	47%





Large percentage of county output. Dramatically increased chances of involuntary suspension. Of the 10,356 acres within 3 miles of a stream and in Capacity Use Areas, 91% are “Grandfathered” Permits.



Conclusions

- Drought mitigation will likely occur in the most productive regions (bang for the buck)
- Historical per acre payments offered by the state are unlikely to entice producers given current commodity prices
- Depending on state strategies, impacts could be highly concentrated (Miller, Decatur, Seminole)
- It is unclear how external factors may impact state management decision
- If it rains...it doesn't matter...for now.

Moving Forward

- Agricultural metering program
 - Wetted acreage mapping/permit reconciliation
- Revised modeling efforts to capture more precise impacts
- Long term retirement – property valuation
- Statewide water planning

Water Plan and Current Law

- The Water Plan does not create law.
- The Water Plan must be policies that are consistent with current statute.
- The Water Plan, once ratified by the General Assembly, is implemented through existing statutory authority, and is enforceable through the permitting authority of EPD and loan approval processes of GEFA.



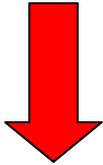
Summary of Plan

- Consumptive Use “Budgets”

- Conservation (*ag*)

- Additional Supply

- Regional Planning

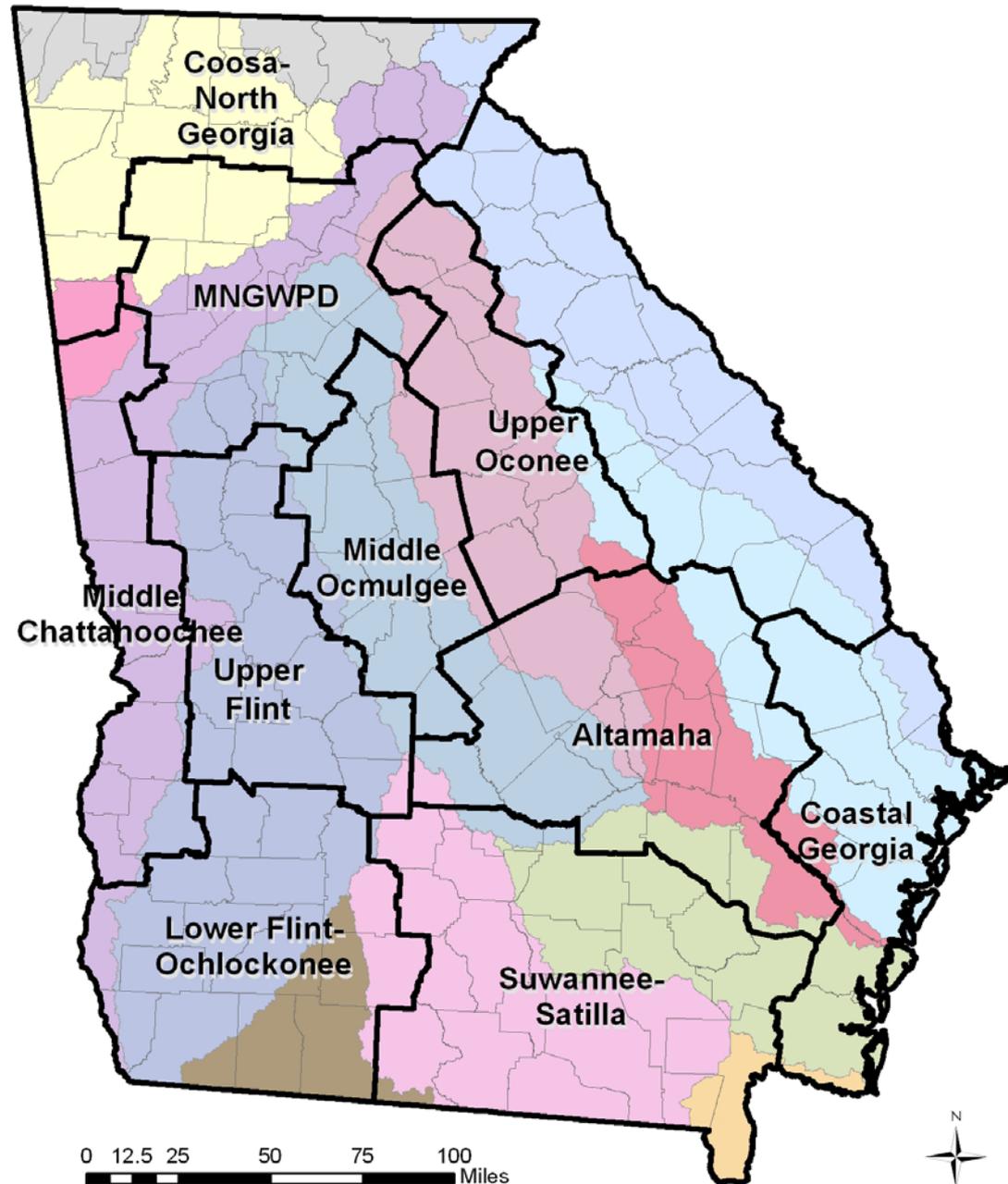


- A Council will be appointed for each region by the Gov (13, 2-2), Lt. Gov (6, 1-1) and Speaker (6, 1-1).

- 3 years terms with option to reappoint

- Councils will adopt “Water Development and Conservation Plans” based on EPD guidance and technical assistance via 3 year MOU.

Water Planning Regions



Acknowledgements

- Jeremy Hill, Director – Coastal Rivers Water Planning and Policy Center
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 - USDA Agricultural Research Service - NPRL



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