

Section 18

Conclusions

The modeled ranges of sustainable yield are summarized in **Table 18-1**. The ranges of sustainable yield are illustrated on **Figures 18-1 to 18-5**. Based on the results of the groundwater modeling simulations for the prioritized aquifer sustainable yields, the following key conclusions were developed:

- Existing groundwater withdrawals are greatest from the Upper Floridan Aquifer followed by the Cretaceous Aquifer and then the Claiborne Aquifer;
- Steady-state models of the prioritized aquifers developed for the Coastal Plain Aquifer System were the best available tool for estimating ranges of sustainable yield for the State of Georgia Groundwater Resource Assessment Project;
- Based on the selected sustainable yield criteria of allowable drawdown from today's conditions of 30 feet or less, and reduction of groundwater contributions to stream baseflow from today's conditions of 40 percent or less, more groundwater is available above existing withdrawals before the sustainable yield of the Coastal Plain Aquifer system is reached;
- Higher ends of ranges of sustainable yield usually occurred with simulations of a combination of non-uniformly increased withdrawals from existing wells, withdrawals from simulated new wells, or both;
- The sustainable yield of any one of the prioritized aquifers considered individually is higher than when considered in combination with increased withdrawals from all of the aquifers in combination;
- Increased pumping above the upper end of the range of sustainable yields during droughts lowers simulated groundwater levels. Simulated groundwater levels recovered nearly to pre-drought levels within 4 years after ending increased drought pumping;
- From the transient modeling of the Claiborne Aquifer, after 40 years of continuous pumping at rates approaching the upper end of the range of sustainable yield, the aquifer storage is not completely utilized and a new equilibrium has not yet been reached; and
- Once all of the groundwater storage is utilized, water needed to supply increased pumping will come from other sources such as surface recharge, leakage from overlying / underlying aquifers, horizontal flow from portions of the aquifer at distance from pumping wells, and from groundwater contributions to stream baseflow.

Table 18-1 Summary of Sustainable Yield Estimates from the Prioritized Aquifers in the Coastal Plain of Georgia

Aquifer	Baseline Groundwater Withdrawal (mgd)	Simulated Groundwater Withdrawal Range from Prioritized Aquifers (mgd)		Increase/Decrease of Groundwater Withdrawal from Existing Wells		Sustainable Yield Metric that Was Exceeded	
				(mgd)	% of Baseline	Water Level Drawdown > 30 feet	Recharge From Streamflow > 40%Q _{MA}
	Sustainable Yields Withdrawing from Existing Wells for Individual Aquifers						
South-Central Georgia Upper Floridan	329	Min	622	293	89.1%	X	
		Max	836	507	154.1%	X	X
South Central Georgia & Eastern Coastal Plain Upper Floridan ¹	475	Min	868	393	82.7%	X	
		Max	982	507	106.7%	X	X
Claiborne	67	Min	100	33	49.3%	X	
		Max	250	183	273.1%	X	X
Cretaceous	124	Min	198	74	59.7%	X	
		Max	201	77	62.1%	X	X
Total for South Central Georgia & Eastern Coastal Plain Upper Floridan & Claiborne & Cretaceous	666	Min	1,166	500	75.1%		
		Max	1,433	767	115.2%		
Sustainable Yields Withdrawing from Existing and Simulated New Wells for Individual Aquifers							
South Central Georgia & Eastern Coastal Plain Upper Floridan	475	Min	955	480	101.1%		X
		Max					
Claiborne	67	Min	250	183	273.1%	X	X
		Max					
Cretaceous	124	Min	201	77	62.1%		X
		Max					
Total for South Central Georgia & Eastern Coastal Plain Upper Floridan & Claiborne & Cretaceous	666	Min	1,406	740	111.1%		
		Max					
Sustainable Yields Withdrawing from Existing Wells for All of the Priortized Aquifers Pumping Simultaneously							
South Central Georgia & Eastern Coastal Plain Upper Floridan	475		768	293	61.7%	X	
Claiborne	67		100	33	49.3%	X	
Cretaceous	124		198	74	59.7%	X	
South Central Georgia & Eastern Coastal Plain Upper Floridan & Claiborne & Cretaceous	666		1,066	400	60.1%	X	

Notes:

¹ The increased withdrawals from the Upper Floridan Aquifer for the Eastern Coastal Plain was considered in combination with the South-Central Georgia Area

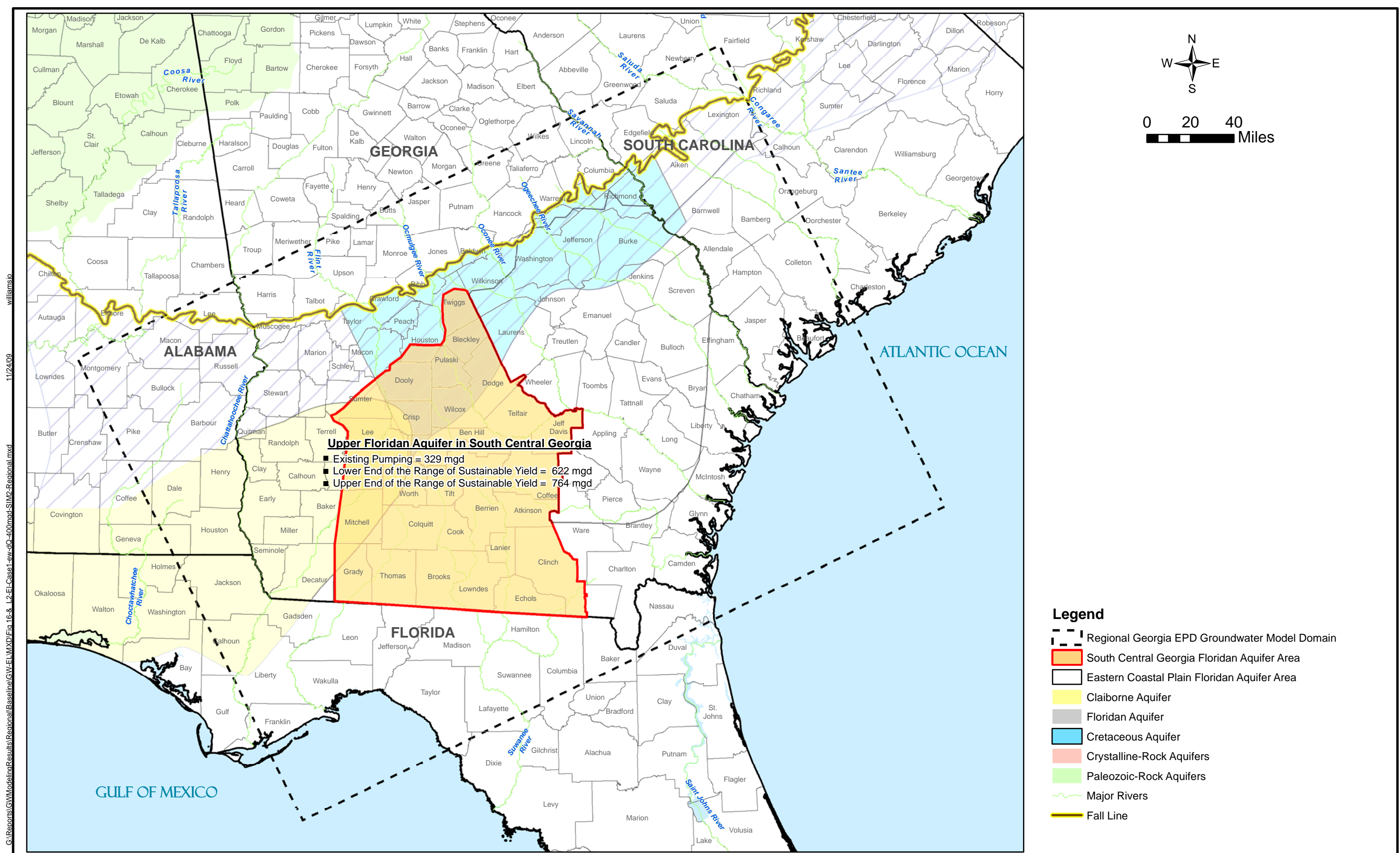
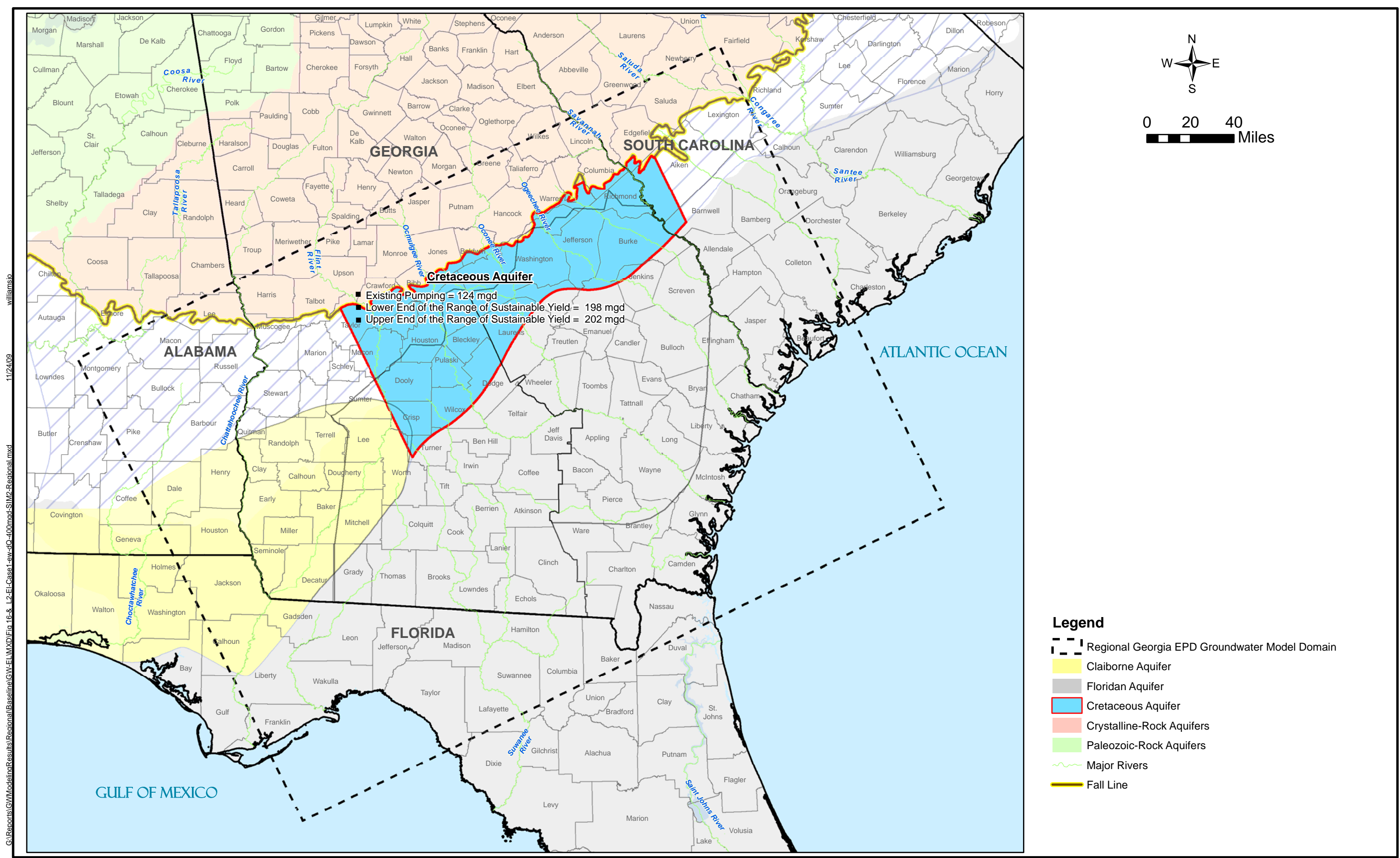


Figure 18-1
Groundwater Modeling for Upper Floridan Aquifer Sustainable Yield Assessment in South Central Georgia



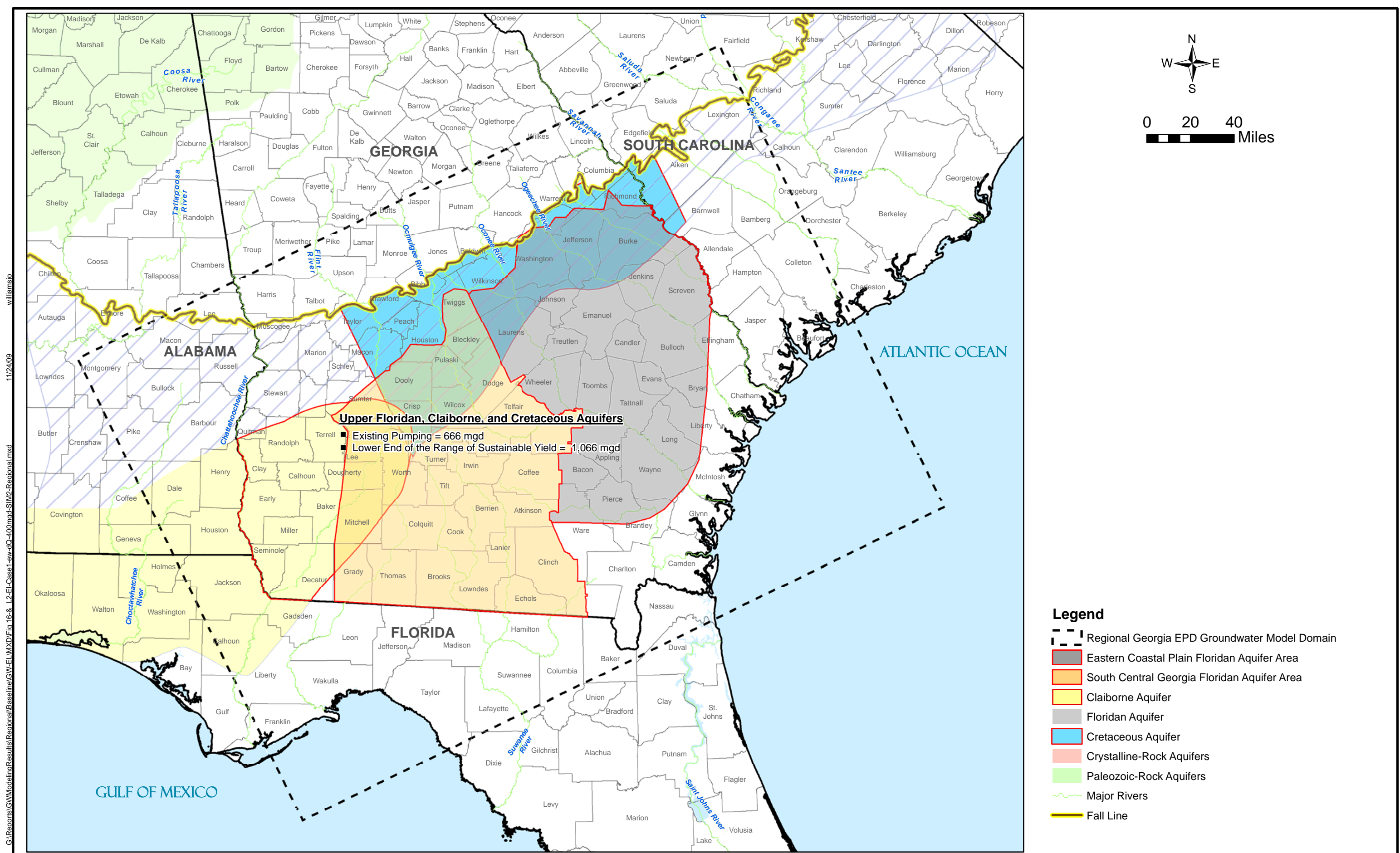


Figure 18-5
Groundwater Modeling for Sustainable Yield Assessment of Upper Floridan Aquifer in South Central Georgia and Eastern Coastal Plain, Claiborne Aquifer, and Cretaceous Aquifer