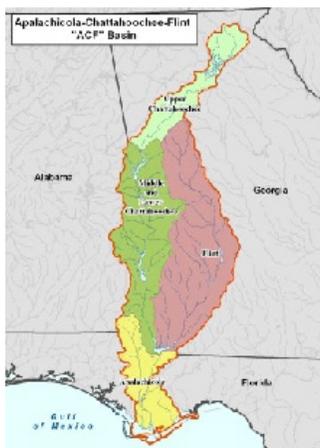


## Patuxent Wildlife Research Center

### WaterSMART: Apalachicola/Chattahoochee/ Flint River (ACF) Basin



**The Challenge:** The USGS WaterSMART (Sustain and Manage America's Resources for Tomorrow) initiative is developing data and tools to help water managers address the questions (1) does the nation have enough fresh water to meet current human and ecological demands, and (2) is there enough fresh water to meet future demands? Specifying ecological demands requires understanding how changes in streamflow regimes (for example, because of water diversion to meet other societal needs, or climatic and land use changes in rainfall and runoff patterns) are likely to influence ecosystem processes, and ultimately, the ability of streams and rivers, lakes, wetlands, estuaries and bays to support fish and wildlife populations. As a WaterSMART Focus Area, the ACF River Basin is providing a context for building on previous studies (including the Southeast Regional Assessment Project, SERAP) to develop models for assessing and forecasting ecological outcomes associated with water resource management options.

**The Science:** USGS scientists from the Patuxent Wildlife Research Center, the Southeast Ecological Science Center and the Georgia Water Science Center, in collaboration with university and state agency partners, are collecting data on how populations of stream fishes and mussels change in response to variation in stream flow. By repeatedly sampling populations over a three-year period in six stream systems for which detailed hydrologic models are being developed, scientists will test and refine hypothesized relations between streamflow variability and population change. These field observations and hypothesis tests will build on previously developed models of how streamflow alteration is expected to affect fish and mussel species distributions and persistence in the ACF basin.

**The Future:** Modeling tools developed from this research will allow stakeholders to evaluate potential changes in ACF aquatic species distributions for alternative water management scenarios. This research may inform future data collection to reduce model uncertainty and improve resource management, and will provide one template for developing flow-ecology in other regions across the nation.