Georgia

DECEMBER 2011

Georgia's Water Future in Focus:

Highlights of Regional Water Planning 2009-2011

Compiled by Georgia Environmental Protection Division

ACKNOWLEDGEMENTS

Georgia's regional water planning could only be accomplished through contributions from many people and organizations. Members of the regional Water Planning Councils, listed by name at the end of this report, led the effort and contributed numerous hours over the past three years.

Thanks to the consultants and staff at CH2MHill, Jacobs, Black and Veatch, CDM, AECOM, Arcadis, and Tetra Tech who provided contract services to support regional water planning. Faculty and staff at the Georgia Institute of Technology, The University of Georgia, and the Georgia Water Planning and Policy Center also provided valuable contractual services.

Thanks also go to our agency partners at the United States Environmental Protection Agency, Georgia Environmental Finance Authority, Governor's Office of Planning and Budget, Georgia Department of Community Affairs, Georgia Department of Natural Resources Wildlife Resources Division and Coastal Resources Division, Georgia Forestry Commission, Georgia Soil and Water Conservation Commission, Georgia Department of Agriculture, and Georgia Department of Economic Development.

Finally, additional thanks to the members of the Scientific and Engineering Advisory Panel as well as representatives of the states of Alabama, Florida, North Carolina, South Carolina and Tennessee.

For more information or to obtain copies of the regional water plans, please go to **www.georgiawaterplanning.org** or call the Environmental Protection Division at **404-675-6232**.

PHOTO CREDITS:

Georgia Department of Economic Development (pages: cover, 1, 4, 5, 6, 8, 15, 16, 23, 24, 32, 39, 40, 43, 44); Georgia Power (page 7); NRCS / Jeff Nonuga (Cover);

CAPTIONS (Front Cover: top to bottom / left to right):

FISHING AT REED BINGHAM STATE PARK, Suwannee-Satilla Basin; COLUMBUS RIVERWALK DUSK, Middle Chattahoochee Basin; COTTON FIELD IRRIGATION, Georgia; SAVANNAH SHIPPING, Savannah Basin; MAGNOLIA SPRINGS STATE PARK MILLEN, Savannah Upper Ogeechee Basin

Georgia's Water Future in Focus:

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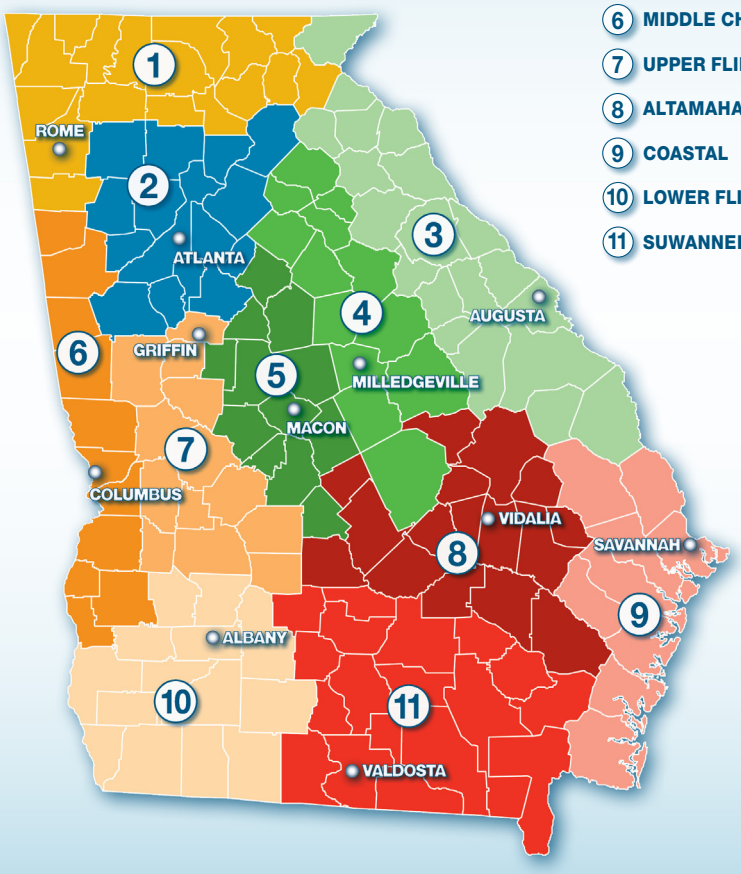
Georgia's Water Planning Regions

1. COOSA-NORTH GEORGIA
2. METRO WATER DISTRICT
3. SAVANNAH-UPPER OGEECHEE
4. UPPER OCONEE
5. MIDDLE OCMULGEE
6. MIDDLE CHATTAHOOCHEE
7. UPPER FLINT
8. ALTAMAHA
9. COASTAL
10. LOWER FLINT-OCHLOCKONEE
11. SUWANNEE-SATILLA



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Georgia's quality of life and economic prosperity are vitally linked to the sustainable management of our water resources.

Executive Summary

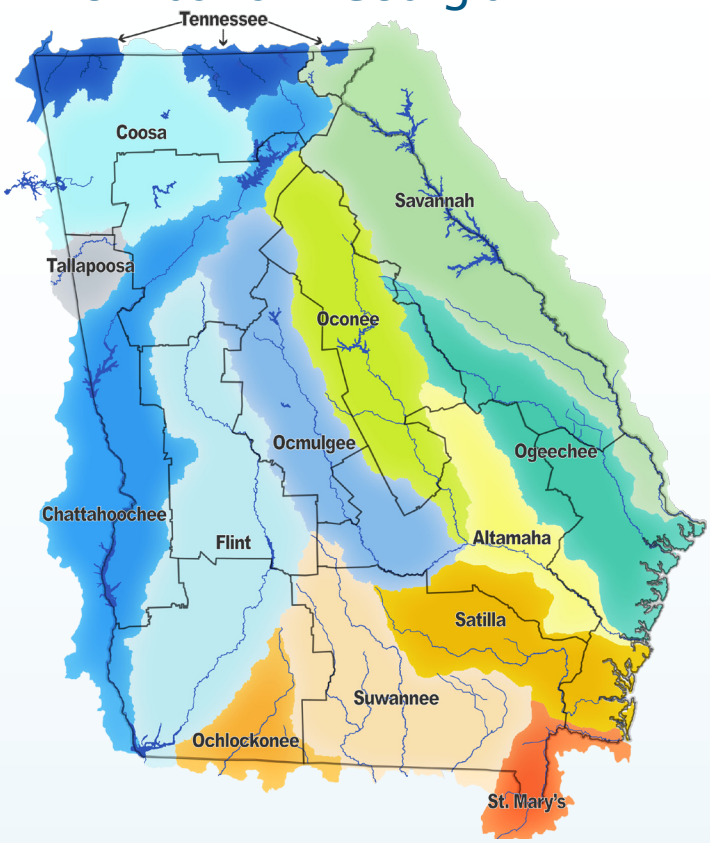

AUGUSTA CANAL, Savannah Basin

Georgia has long been one of the fastest growing states in the nation. Between 2000 and 2010, Georgia gained 1.5 million new residents, ranking 4th nationally. Georgia is home to over 40 Fortune 1000 companies and over 2,500 internationally headquartered facilities with an estimated capital investment of $24 billion. Our agricultural industry employs over 350,000 people and has an economic impact of almost $70 billion.

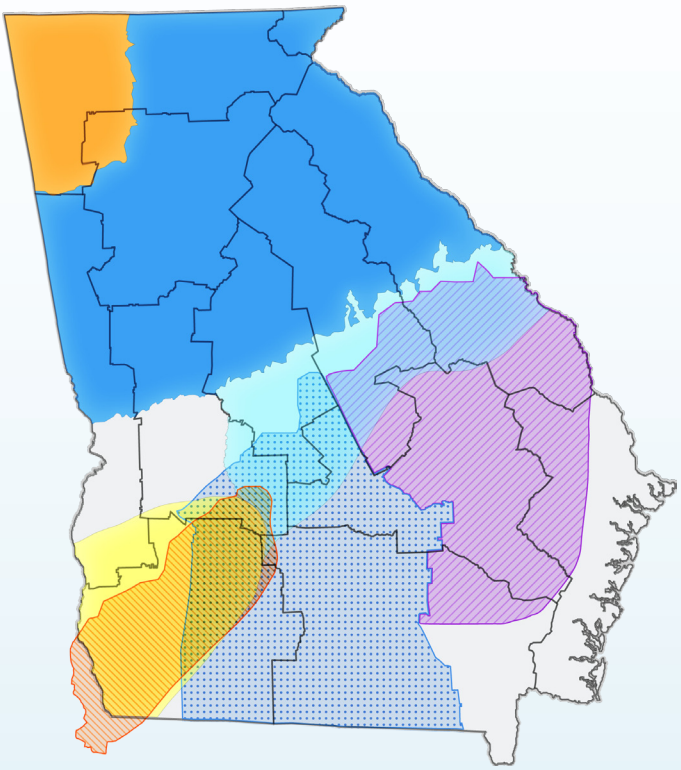
Georgia enjoys abundant water resources, with 14 major river systems and seven highly productive groundwater aquifers. These resources are shared by many users, supporting a wide array of natural systems and human activities.

Although water in Georgia is plentiful, it must be carefully managed to meet the needs of a variety of users. Water plans have been developed for Georgia's eleven water planning regions to help ensure that our water resources continue to support the state's economy and natural systems. The plans outline near-term and long-term strategies to meet water needs through 2050.

River Basins in Georgia



Aquifers in Georgia



AQUIFER LEGEND

- Paleozoic-rock Aquifer
- Crystalline-rock Aquifer
- Cretaceous Aquifer in Georgia's Coastal Plain
- Claiborne Aquifer in Georgia's Coastal Plain
- South Central Georgia Floridan Aquifer Area
- Dougherty Plain Upper Floridan Aquifer Area
- Eastern Coastal Plain Floridan Aquifer Area

Regional water planning has helped Georgia take meaningful strides forward in water management. Plans were developed from the bottom up, with solutions identified by a cross-section of regional leaders. They are fact-based, building on scientific observations and information from people who live and work in each region. Recognizing that blanket solutions will not meet our water challenges, the plans emphasize local and regional action with the flexibility to adapt to changing circumstances.

Introduction

This report presents highlights of regional water planning conducted from 2009 to 2011, following the 2008 adoption of Georgia's State Water Plan. The State Water Plan established ten new Water Planning Councils that, with the Metropolitan North Georgia Water Planning District, have now completed plans for the state's 11 water planning regions.

In the three years since adoption of the State Water Plan, over 30,000 volunteer hours have been contributed and the State has invested $30 million in technical work and activities to support regional water planning. The Councils and District have developed regional water plans that together provide a roadmap for sustainable use of the Georgia's water resources. Local governments, utilities, industries, and other water users in each region will implement the plans, and plan contents will help guide state agency decisions on water permits and grants and loans for water-related projects.

To prepare this report, we selected highlights from the eleven regional water plans. The full plans contain more in-depth information and should be consulted for details. The water plan for your region(s) can be downloaded from www. georgiawaterplanning.org or requested by contacting the Environmental Protection Division.

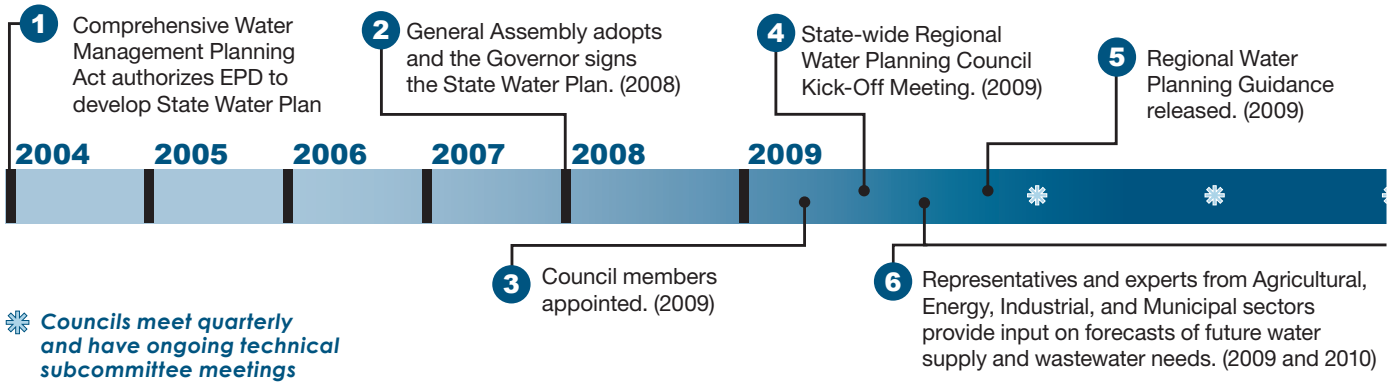
This report has four main sections, each addressing a different component of regional water planning. Sections 2 and 3 describe forecasts of water needs and the capacities of Georgia's water resources. Section 4 provides an overview of the water management approaches presented in each regional plan. The final section outlines Georgia's water planning process and steps following adoption of the regional water plans.

Improving Information and Understanding Issues

Homes, schools, businesses, and farms all require water, and the wastewater generated by some water uses has to be safely discharged. Understanding the demands on our water resources is a critical first step in managing Georgia's waters for the future. Forecasts of water and wastewater demand were prepared to support regional water planning, providing this information on a consistent, statewide basis for the first time.

Understanding the capacities of water resources to meet the demands placed on them is also critical to managing water for the future. Over the past three years, EPD led the development of groundwater sustainability models for the most-heavily used aquifers in the state, surface water availability models for the state's major river basins, and water quality models for many streams and most of the large lakes in the state.

State Water Plan Timeline



Building on prior investments in monitoring and assessment of Georgia's waters, this technical work filled critical information gaps. Results were tested against the knowledge of the Council members who live and work in each region, providing feedback used to refine the tools. The Councils and other participants also identified additional improvements to enhance the models for future use.

Results of these assessments show that, in most regions, additional groundwater is available to meet current and future groundwater needs. Two areas do face limitations on the availability of groundwater. The first is Southwest Georgia, where demand for groundwater exceeds the amount that can be sustainably withdrawn from the region's principal aquifer. The second area lies along the coast, where groundwater availability is limited by movement of saltwater into the principal aquifer. In these areas, additional demand for water will have to be met from surface water or from other aquifers.

For surface waters, results indicate that much of the state has sufficient water to meet future demands. In river basins with large reservoirs, existing surface water storage could help meet future needs if agreements allowing that use can be made with reservoir owners (U.S. Army Corps of Engineers and power companies).

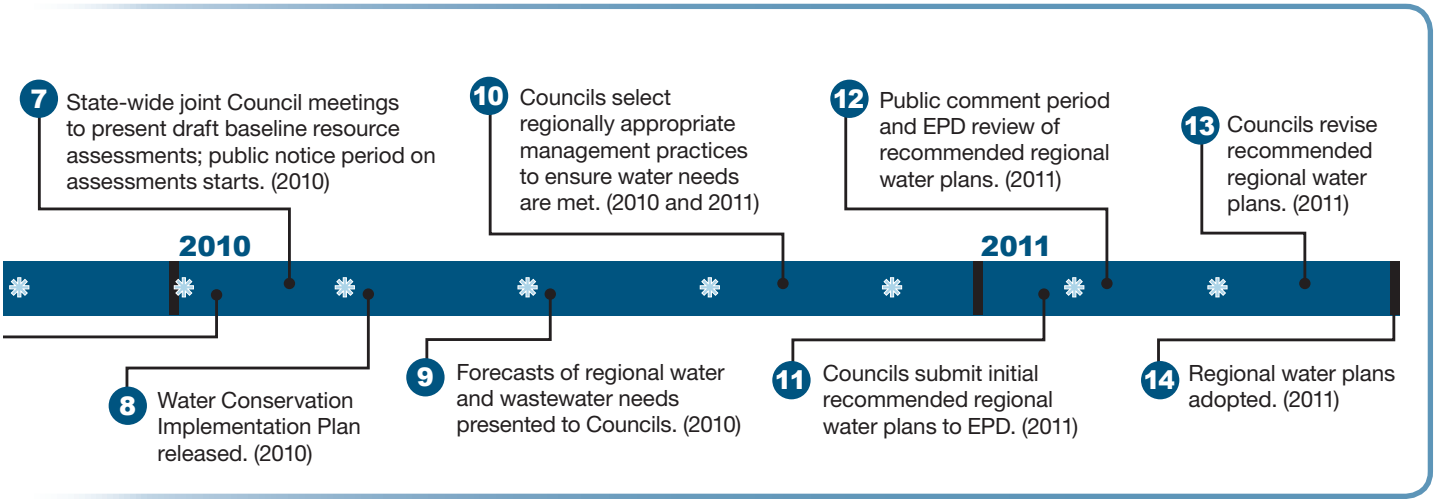
In some other river basins, however, there may not be enough water during dry periods to meet demands for water and have stream flows above minimum thresholds. These results provide a warning that water consumption may impact uses that rely on water within the banks of streams, rivers, and lakes, such as boating and recreation. As described in Section 4, actions to increase water conservation and water supply will be particularly important in these areas.

OKEFENOKEE SWAMP, St. Mary's Basin

Most of the surface waters we studied will be able to handle additional discharges of treated wastewater. Some dischargers, however, may have to provide higher levels of wastewater treatment in order to protect water quality.

In all water planning regions, assessments identified water bodies that currently have poor water quality, often due to the pollutants carried by stormwater. Results also identify areas where pollutants carried in stormwater runoff may cause water quality problems in the future. Actions are needed to protect or restore the water quality in these streams, rivers, lakes, and estuaries.

Finally, the regional water plans highlight issues specific to individual regions. Examples include operation of federal reservoirs, protection of recreational uses on lakes, wastewater discharges in waters shared with neighboring states, and water quality issues associated with low levels of dissolved oxygen. Where applicable, the plans recognize the complementary activities that are underway to address these issues.



Meeting Georgia's Water Resource Challenges

The Water Planning Councils spent almost three years examining and refining technical information about water resources and water use, comparing that information to visions and goals for their region, and identifying strategies for management. What has emerged are a set of practical approaches – customized for each region – to support continued growth and prosperity statewide while maintaining healthy natural systems.

The regional water plans identify a range of actions or management practices to help meet the state's water challenges. In regions facing challenges with availability of surface water and groundwater, the plans recommend actions such as increasing water conservation and efficiency of use, master planning for local water systems, expanding or optimizing use of existing reservoirs, constructing new reservoirs where needed and feasible, and shifting to alternative sources of water.

To address water quality challenges, some or all of the plans call for higher levels of wastewater treatment, master planning for local wastewater systems, improved floodplain management, and stream buffer protection, among other actions. The plans also identify strategies to address water quality problems that result from stormwater carrying pollutants into water bodies, including a funded nonpoint source management project in each region.

CUMBERLAND ISLAND, Coastal Georgia

TALLULAH GORGE STATE PARK, Savannah Basin

GEORGIA VETERANS STATE PARK GOLF, Flint Basin

YELLOW RIVER WATER TREATMENT PLANT, Ocmulgee Basin

Implementing these plans is critical to meeting Georgia's water resource challenges. Local governments and others who develop water infrastructure and apply for permits, grants, and loans have a central role in plan implementation. State government also has an important role in supporting implementation. And, as emphasized in the plans, the success of implementation will rest, in large part, upon funding at state and local levels.

Continuing to improve data and information will also be important in meeting our water resource challenges. Over the past few years, the State made substantial investments in modeling tools and monitoring networks. However, information gaps and uncertainties still affected the Councils' ability to plan. The regional water plans all include specific actions necessary to improve the tools and information used in water planning and management.

An on-going regional voice in water planning will be another key to meeting Georgia's water resource challenges. Given the progress and needs identified to date, all plans recommend State actions to support on-going activity by the Water Planning Councils.

Finally, the regional water plans recognize the activities underway to promote water conservation, improve operations of federal reservoirs, address water quality in waters shared with other states, resolve interstate disputes over water supply, and meet a number of other region-specific challenges. The strategies in the plans reflect these complementary activities and will be implemented in concert with them.

In summary, the regional water plans are not themselves an end. The plans present solutions identified by a cross-section of regional leaders, drawing on regional knowledge and priorities. They are based on consistent, statewide forecasts of needs and reflect the best available information on the capacities of Georgia's waters. The tools used to assess the capacities have been tested and refined, and will be further refined as we continue to improve information for planning and management. The process and results of regional planning, taken together, provide solid footing for plan implementation and the five-year review and revision required by the State Water Plan.

The investment in these assets will continue to pay off over time, advancing management of Georgia's waters to support the state's economy, protect public health and natural systems, and enhance the quality of life for all citizens.

Estimating future demands for water supply and wastewater discharge are critical pieces of the water management puzzle. Statewide forecasts of water and wastewater needs provide an important new planning tool.

Future Water and Wastewater Needs


PLANT VOGTLE, Savannah Basin

How much water will be needed to meet water supply demand in the future? And, how much wastewater do we expect to be discharged in the future?

In the past, these questions have only been answered for parts of the state, with different methods often applied in different areas. To support regional water planning, the Environmental Protection Division (EPD) worked with other state agencies and water users to produce consistent statewide estimates of future water and wastewater needs.

Forecasts were developed separately for three major sectors of water use: municipal and industrial, agricultural, and thermoelectric. To prepare the forecasts, we examined past trends and identified changes likely in the foreseeable future. Initial forecasts were based on data collected consistently across the water planning regions. EPD and the Councils then worked with water providers and users in each region to check and adjust the data where needed.

Forecasts of water for each decade from 2010 through 2050, summarized in the following pages, were provided to the Water Planning Councils as one of their starting points for regional water planning.

CAMPING AT FDR STATE PARK, Chattahoochee Basin

Municipal and Industrial Water

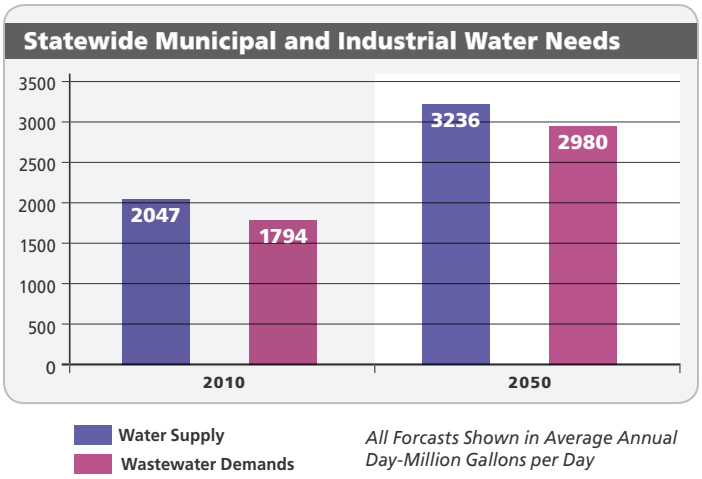
These figures show forecasts of municipal and industrial water supply and wastewater needs for 2010 and 2050. Estimates are presented by region, with statewide totals shown below. Estimates are calculated as millions of gallons of water needed on an average day.

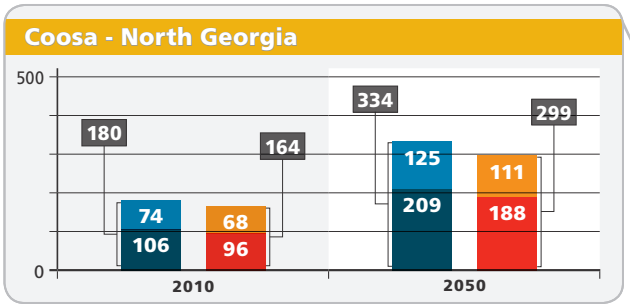
Municipal water needs consist of water used in households, businesses, and smaller industrial facilities. Water provided by public and private water systems as well as water from household wells is included.

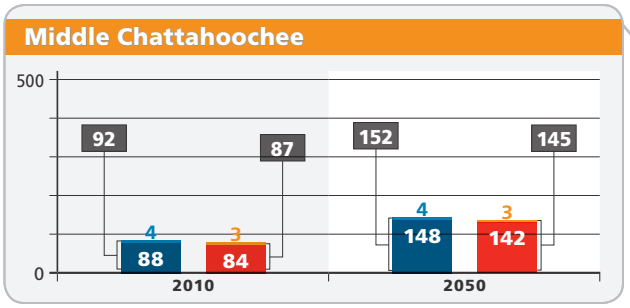
Municipal water needs were calculated from county-level population projections from Georgia's Office of Planning and Budget, multiplied by estimates of per capita water use for each county. Representatives of local governments and utilities provided input to refine initial estimates. For future years, per capita rates were adjusted to reflect water savings due to more efficient appliances and plumbing fixtures, as required by federal and state laws.

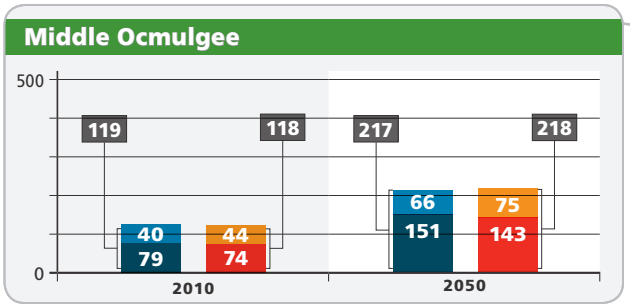
Future water use by large industries was estimated for each of Georgia's major water-using industries. EPD worked with industry representatives to prepare estimates based on specific information for each industry.

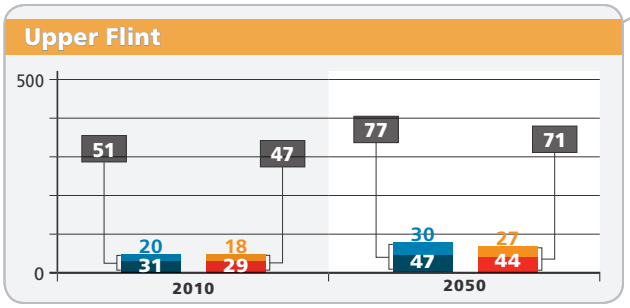
We also forecast the amount of wastewater to be treated in municipal or industrial treatment facilities and the amount to be discharged to individual septic systems. Municipal wastewater estimates reflect forecasts of indoor water use, while industrial wastewater estimates are based upon the amount of wastewater that is currently generated.

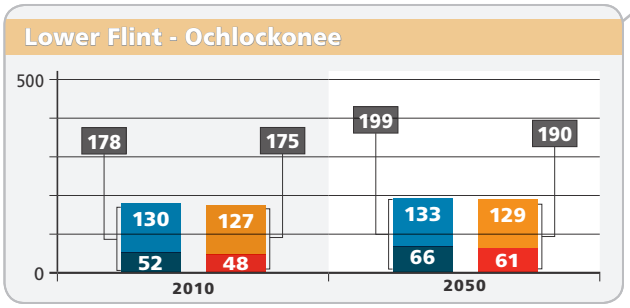












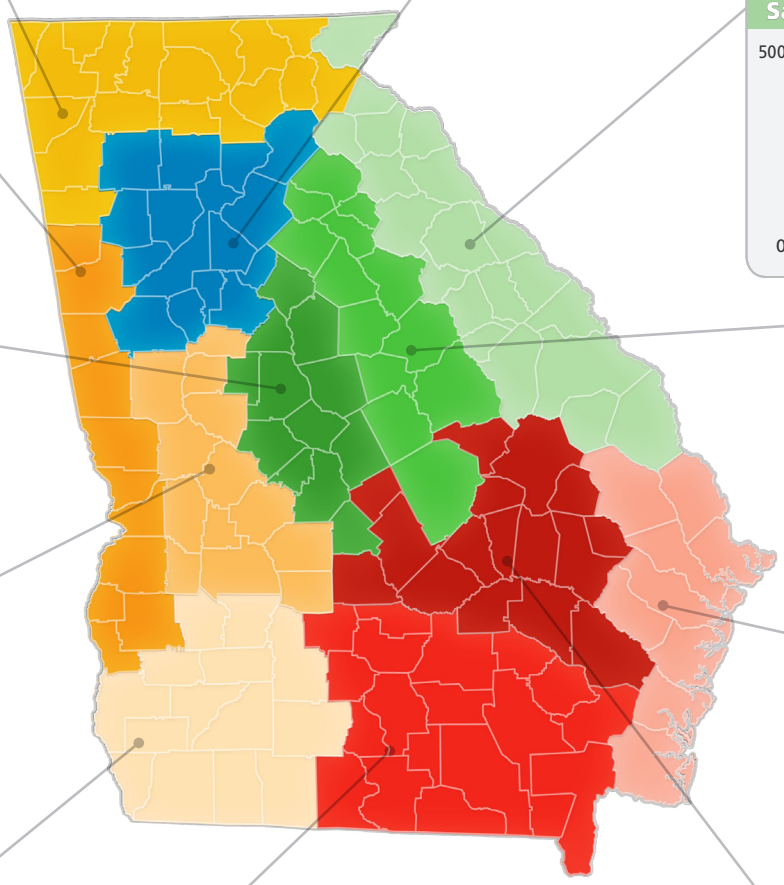
and Wastewater Needs

LEGEND

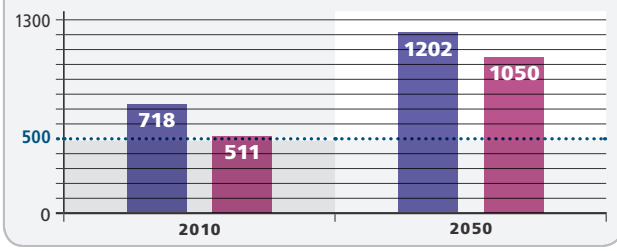
WATER SUPPLY	WASTEWATER DEMANDS
Industrial	Industrial
Municipal	Municipal
Industrial/ Municipal	Industrial/ Municipal

TOTALS

All Forcasts Shown in Average Annual Day-Million Gallons per Day



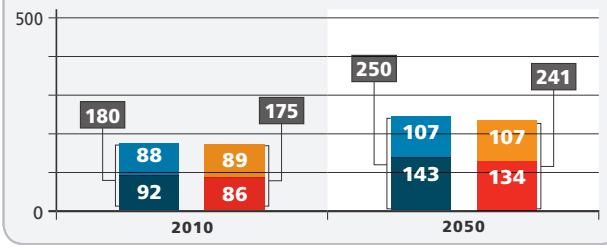
Metro Water District *



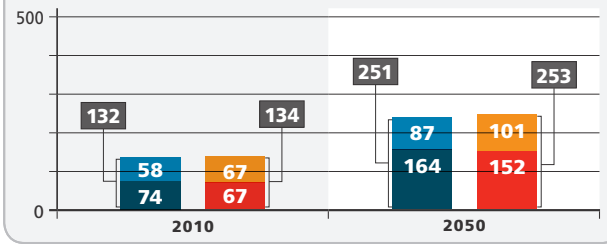
* Municipal and Industrial Demands were not forecasted separately within this plan.

The scale of this chart is also different from the other regions

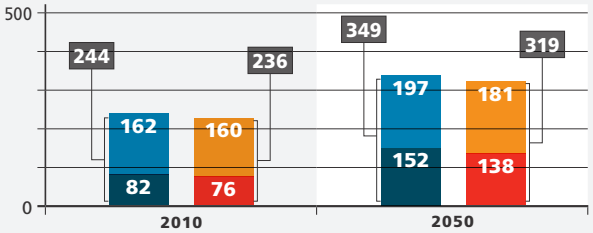
Savannah - Upper Ogeechee



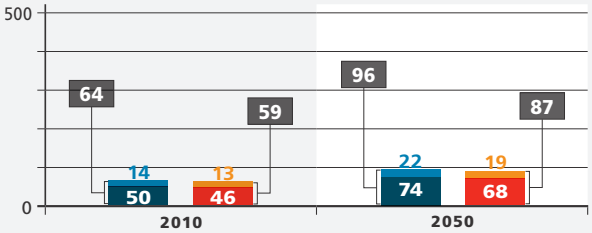
Upper Oconee



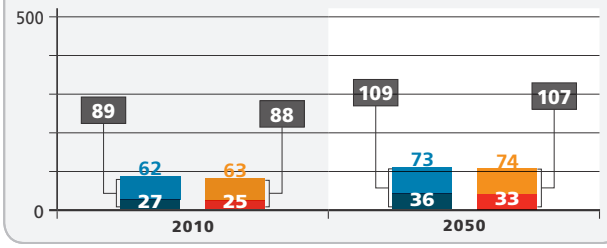
Coastal



Suwannee - Satilla



Altamaha



Agricultural Water Needs

The figures on this page present the forecasted agricultural water needs in each region for 2010 and 2050. Statewide totals are presented below. Most agricultural water use occurs during the growing season and the detailed forecasts estimate use for each month under different weather conditions. For this report, results are expressed as millions of gallons of water needed on an average day during a dry year.

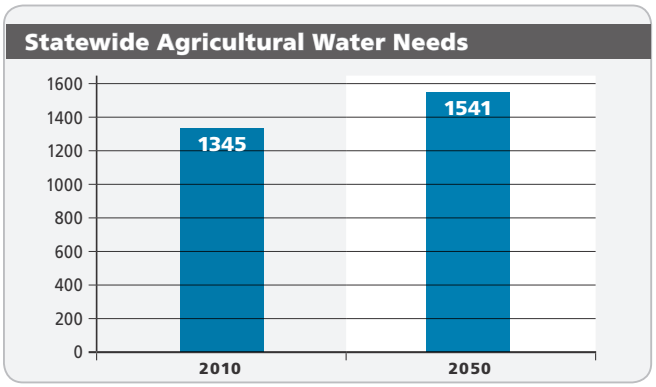
Forecasts of agricultural water needs focused on the five crops that make up 85% of irrigated area in Georgia: corn, cotton, peanuts, soybeans, and pecans. Other major commodities, such as fruits and vegetables, were also taken into account.

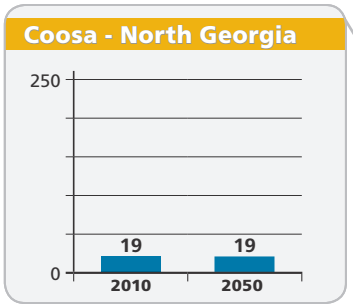
Estimates of agricultural water needs were developed by predicting which crops would be grown, how many acres of each would be irrigated, and where they would be grown. Future water needs were then calculated for a range of potential weather conditions. Likely water sources were also identified.

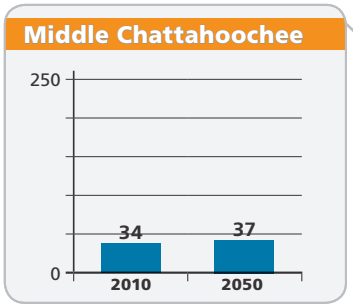
EPD worked with representatives of the agricultural sector and other state agencies to prepare the forecasts. Meters on irrigation systems were a major source of acreage and withdrawal locations, and metering data were used to confirm results.

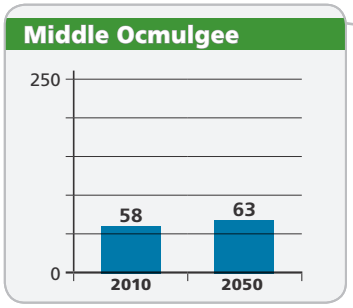
In addition to major crops, forecasts include estimates of current and future water use by nurseries, water currently used for animal operations, and current water use by golf courses classified as agricultural water users (estimates of future golf course use were not available).

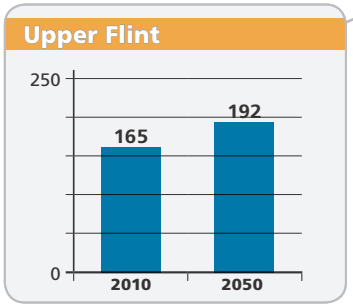
Unlike municipal and industrial water use, most crop production does not produce wastewater that has to be treated and discharged. Forecasts only addressed agricultural needs for water supply.

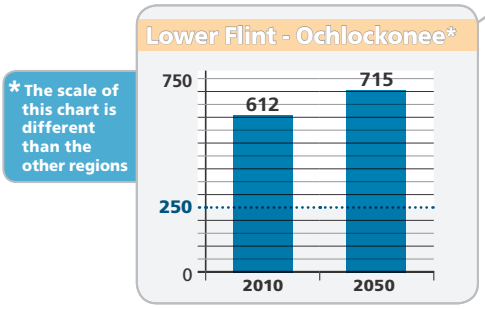




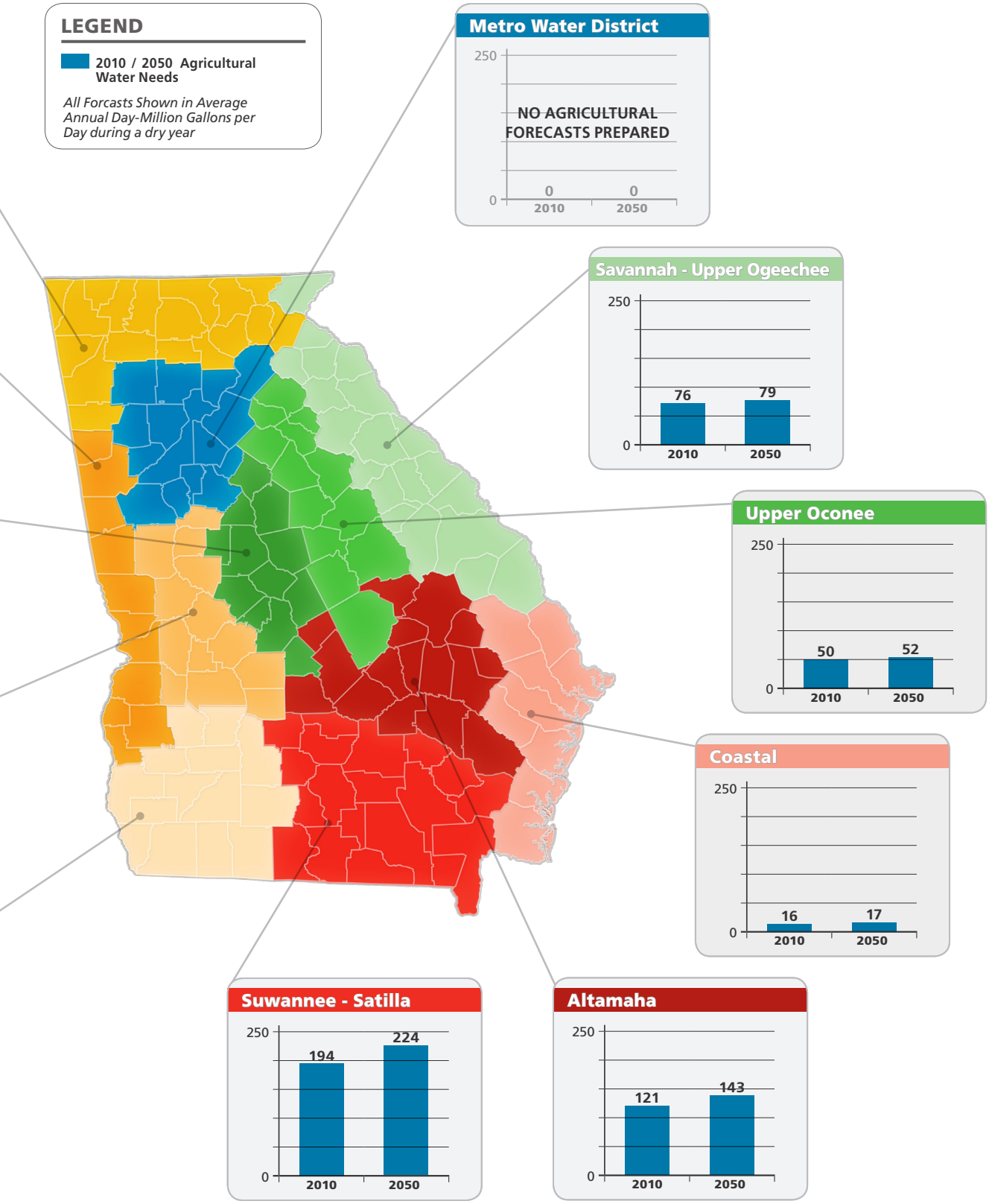








* The scale of this chart is different than the other regions


LEGEND
2010 / 2050 Agricultural Water Needs
All Forcasts Shown in Average Annual Day-Million Gallons per Day during a dry year
Metro Water District
250
NO AGRICULTURAL FORECASTS PREPARED
0
0
0
2010
2050
Savannah - Upper Ogeechee
250
76
79
0
2010
2050
Upper Oconee
250
50
52
0
2010
2050
Coastal
250
16
17
0
2010
2050
Suwannee - Satilla
250
194
224
0
2010
2050
Altamaha
250
121
143
0
2010
2050

Thermoelectric Power Needs and

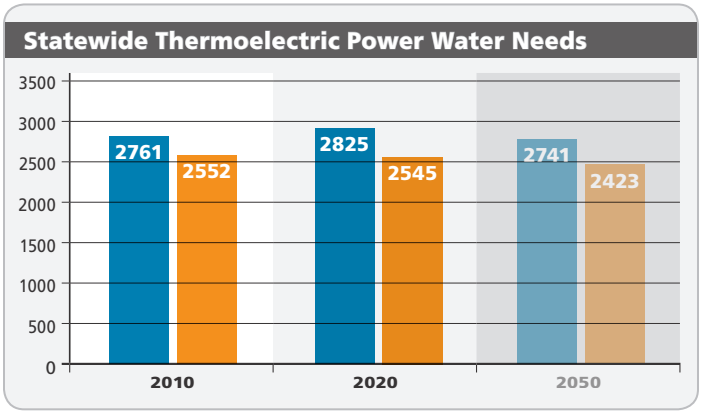
Thermoelectric facilities in Georgia withdraw more water than other water use sectors in the state. Unlike other sectors, however, consumption of water during thermoelectric power generation is relatively low. Over 90% of the water withdrawn for thermoelectric use is almost immediately returned, usually to the source from which the water came.

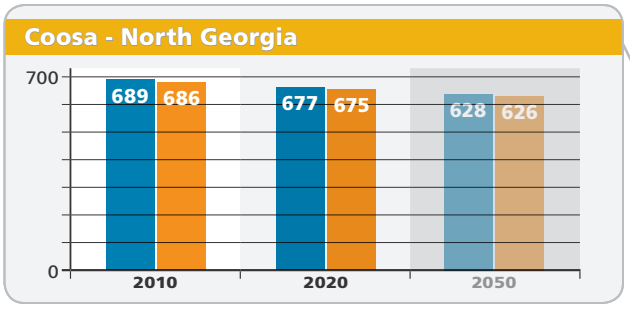
These figures show forecasts of water demand for thermoelectric production and the amount of water that is expected to be returned after use. Results are expressed as millions of gallons of water to be withdrawn or returned on an average day. EPD worked with representatives of the state's major electricity producers to develop the forecasts.

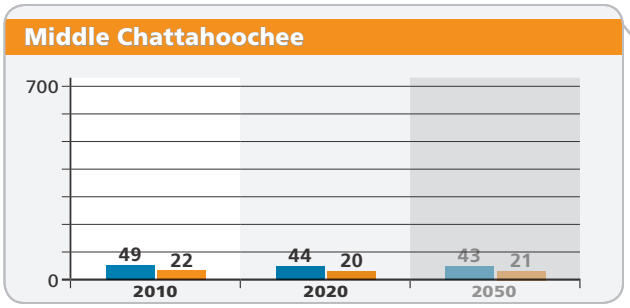
The year 2020 is included as a reliable short-term forecast of thermoelectric power production in each region, based on facility plans provided by Georgia's large electricity producers.

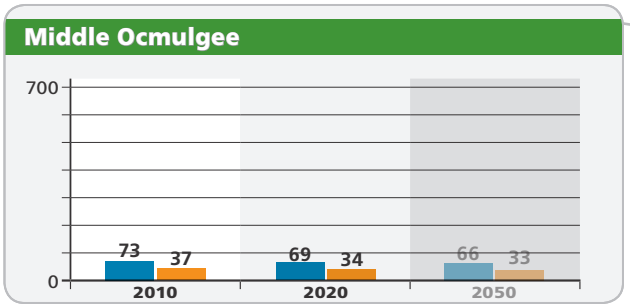
Beyond 2020, forecasts for each region are less reliable, due to uncertainty about the types and locations of new generating facilities. As a result, thermoelectric water needs for 2030 to 2050 were estimated for the state as a whole and not assigned to regions. Some Councils chose to include a portion of the statewide demand in the regional demands shown here. The statewide totals shown below are the sums of the forecasted thermoelectric demand and return in each plan.

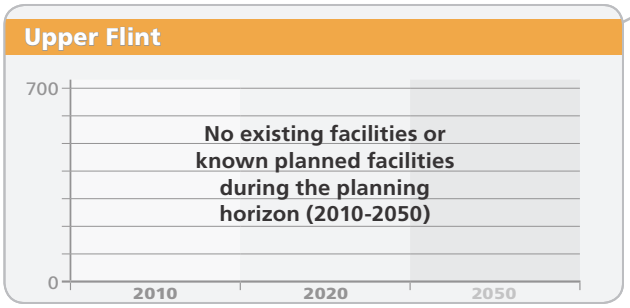
Energy use is expected to increase with population growth. However, the mix of production processes is expected to change over time, resulting in lower thermoelectric water demand in 2050. Use of once-through cooling processes is expected to decrease, which will reduce water withdrawals.

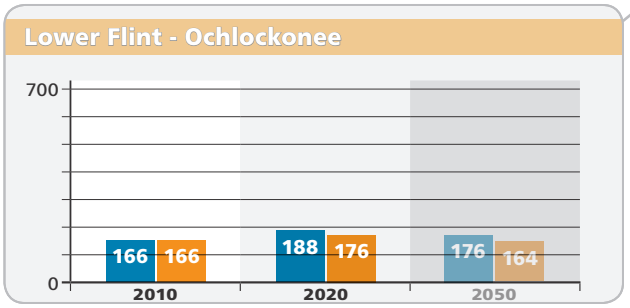










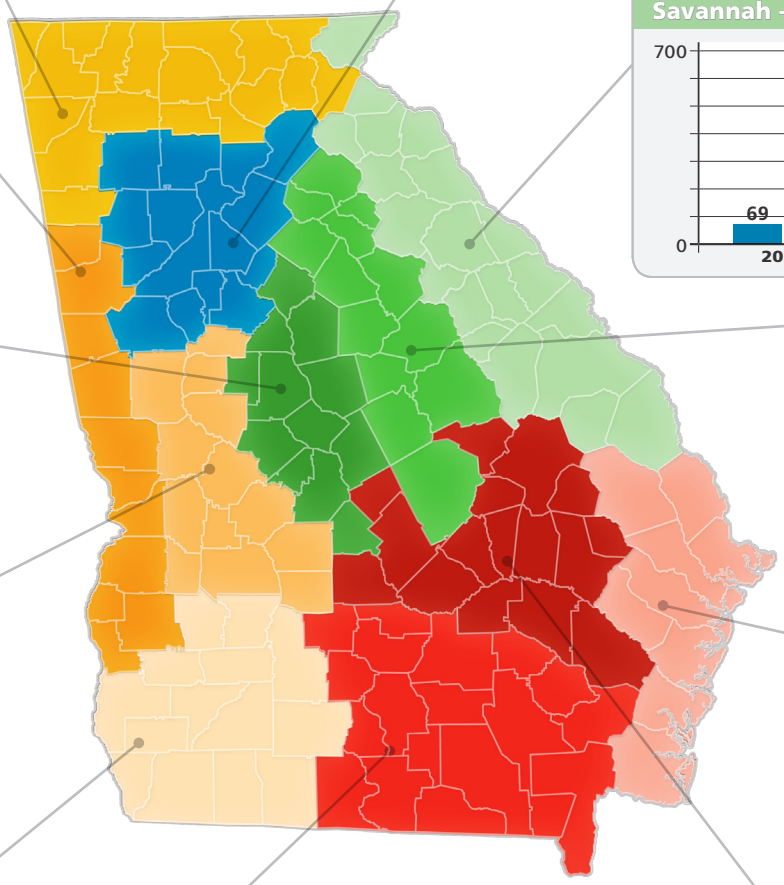


Returns

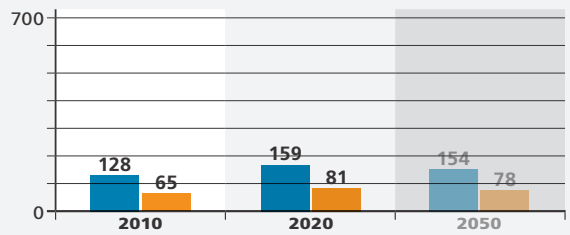
LEGEND

- Thermoelectric Power Water Demands
- Thermoelectric Power Water Returns

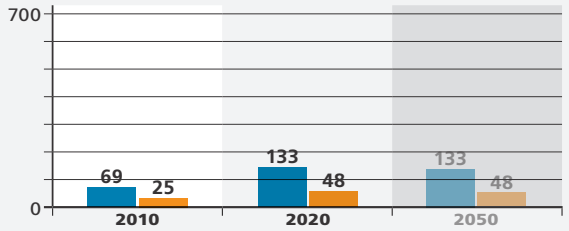
All Forcasts Shown in Average Annual Day-Million Gallons per Day



Metro Water District

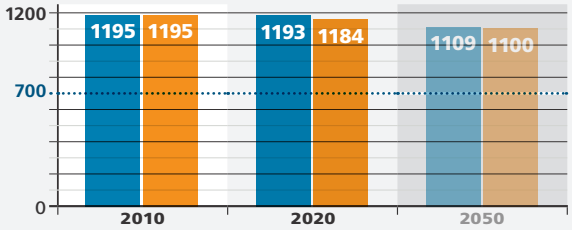


Savannah - Upper Ogeechee

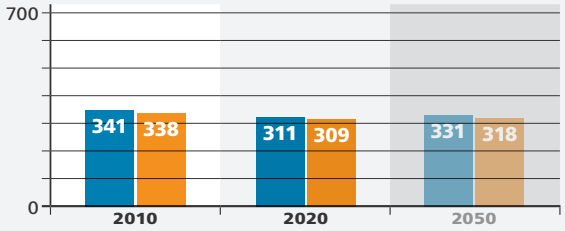


* The scale of this chart is different than the other regions

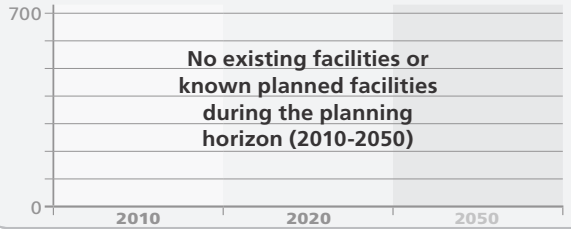
Upper Oconee *



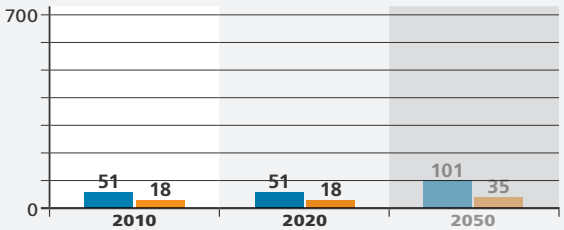
Coastal



Suwannee - Satilla



Altamaha



We cannot effectively plan for and manage what we do not properly measure. Better technical information about Georgia's water resources is necessary to ensure sustainable management. What are the capacities of our water resources?

Georgia's Water Resources


HIGH FALLS STATE PARK, Ocmulgee Basin

The state's waters support a range of uses and provide a variety of benefits. These include benefits from water withdrawn for household, commercial, industrial, and agricultural use, among others. Surface waters also provide benefits through uses that occur within the banks of streams, rivers, and lakes. These instream uses include dilution and processing of wastewater, boating, fishing, and other uses.

To improve information on the long-term capacity of Georgia's waters to support all these uses, EPD modeled responses of water resources to a range of demands. Results were compared with thresholds that indicate unacceptable impacts. The models determined if demands for water consumption and wastewater discharge can be met without violating the thresholds. The results helped Councils identify areas where management actions will be needed to ensure long-term sustainability.

Models were developed to assess groundwater availability, surface water availability, and surface water quality. Results for current conditions were generally consistent with the observations of water users and managers in each region, demonstrating the models' value as tools for assessment of future conditions and alternatives. Council members reviewed the results and provided input to further enhance the models' value as assessment tools.

GRAND BAY WILDLIFE MANAGEMENT AREA IN LANIER COUNTY, Suwannee-Satilla Basin

Groundwater Availability

Groundwater availability was evaluated by looking at the amount of groundwater that can be withdrawn from an aquifer without causing negative impacts. This amount is known as the aquifer's sustainable yield. The negative impacts evaluated to determine sustainable yield included decreases in water levels that can affect neighboring wells and reductions in the amount of groundwater that seeps into streams and contributes to streamflow.

Results indicate that, for most of the aquifers in Georgia's Coastal Plain, relatively large quantities of additional groundwater are available before sustainable yields are reached – with two exceptions. The first exception is the Upper Floridan aquifer in the Dougherty Plain. The second is the Upper Floridan aquifer in the Brunswick and Savannah areas, where movement of saltwater into the aquifer is a significant localized issue.

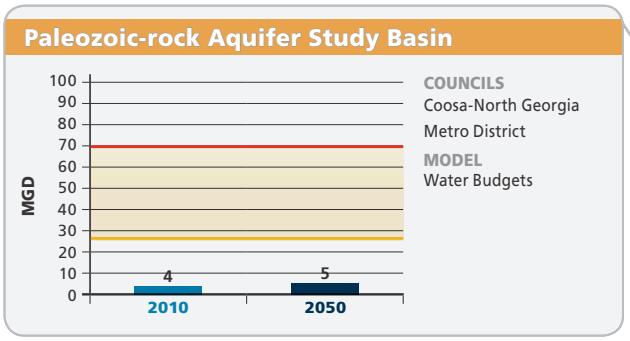
Smaller amounts of additional groundwater are also available from the Paleozoic rock aquifer in northwest Georgia and from the crystalline rock aquifer in the Piedmont and Blue Ridge, before sustainable yields are reached.

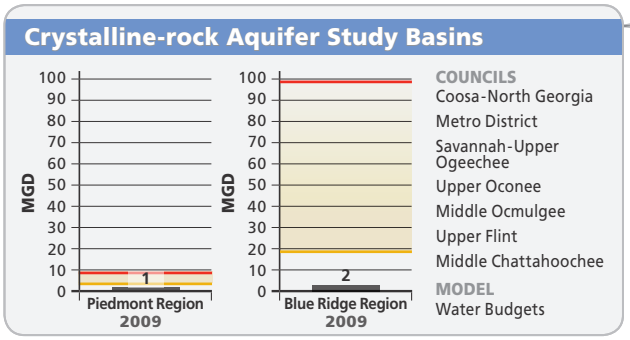
For all of the aquifers studied, the amount of water that can be sustainably withdrawn will depend, in part, on the location of new wells. Site-specific studies will be necessary to determine groundwater availability at a more detailed level.

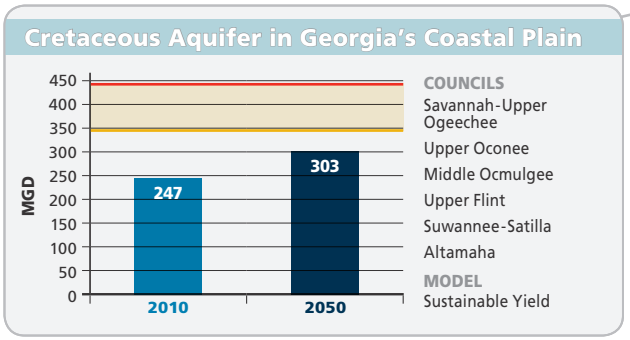
Sustainable yields were determined by modeling differing amounts and locations for groundwater withdrawals. Determining the sustainable yield of all of the aquifers in Georgia would have been quite costly and time consuming. Studies were conducted on the most important aquifers, as indicated by the amount of water currently withdrawn and forecasts of significant increases in demand, among other characteristics.

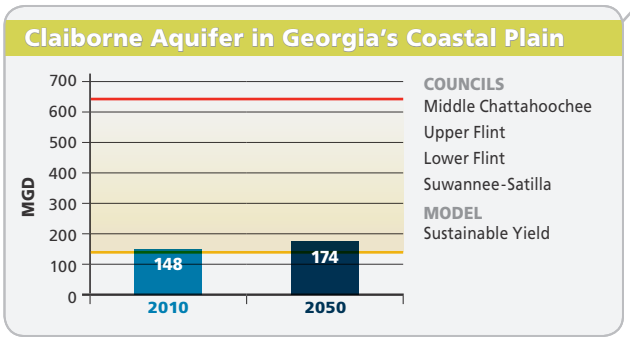
This figure show the location of each aquifer studied and the forecasted groundwater demand for 2010 and 2050 (the crystalline rock aquifer was not evaluated for these years, so results are limited to 2009).

The range of sustainable yield for each aquifer is shown by the orange bar across each graph. Demand and sustainable yields are expressed in millions of gallons on an average day in a dry year (abbreviated mgd).



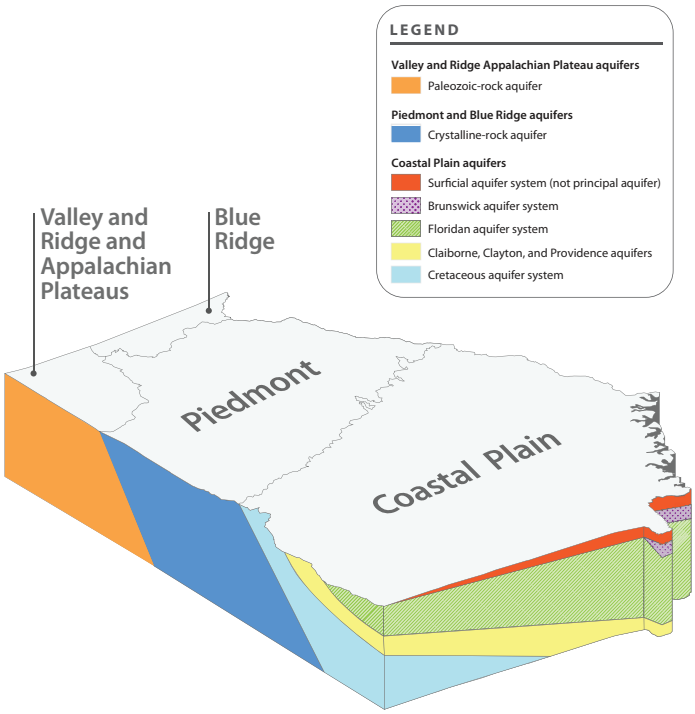


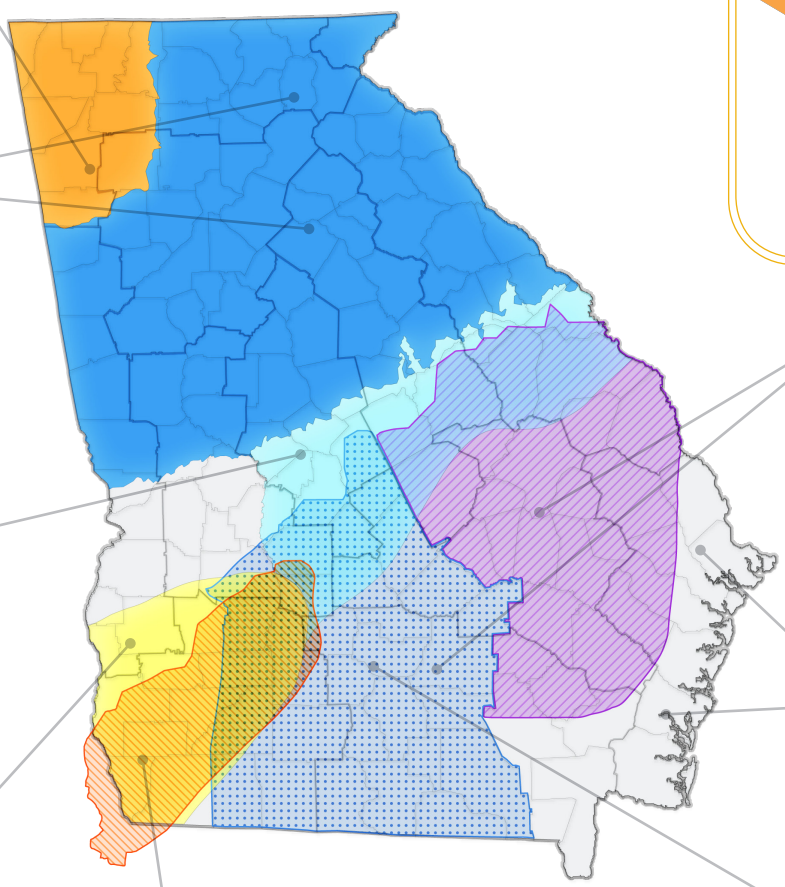




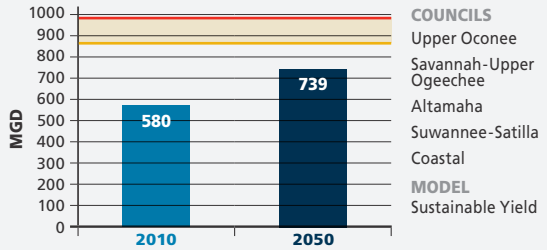
LEGEND

- Paleozoic-rock Aquifer
- Crystalline-rock Aquifer
- Cretaceous Aquifer in Georgia's Coastal Plain
- Claiborne Aquifer in Georgia's Coastal Plain
- South Central Georgia Floridan Aquifer Area
- Dougherty Plain Upper Floridan Aquifer Area
- Eastern Coastal Plain Floridan Aquifer Area
- Range of Sustainable Yield
- Projected Demand with 75% Agricultural Use in 2010 and 2050
- Projected Demand in 2009
- MGD Million Gallons per Day





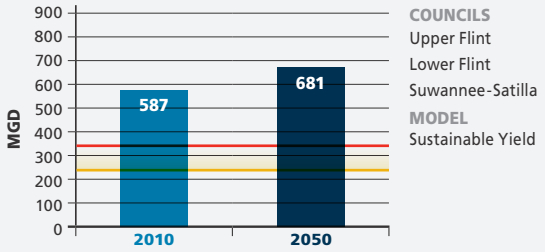
Upper Floridan Aquifer: South Central Georgia and Eastern Coastal Plain (Modeled Together)



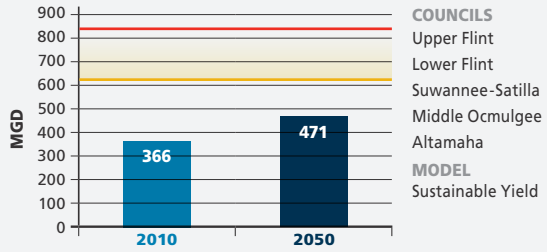
Coastal Area

The Upper Floridan aquifer along the coast was intensively studied before regional water planning began. EPD's 7-year study of coastal groundwater has shown that, in some parts of the region, availability is limited by movement of saltwater into the aquifer.

Upper Floridan Aquifer: Dougherty Plain



Upper Floridan Aquifer: South Central Georgia



Surface Water Availability

Surface water availability was evaluated by analyzing the impact of water consumption on stream flows at certain locations in each river basin. Water consumption is defined as withdrawals from a water body that are not returned to that water body. Water consumption can decrease the capacity of a water body to support other uses, including instream uses such as boating, fishing, and dilution of wastewater.

Results indicate that, in much of the state, there is sufficient surface water to meet current and future water supply needs and have stream flows above minimum flow thresholds. In river basins with large reservoirs, existing storage could help meet needs if agreements allowing use of that storage can be reached with reservoir owners.

In other parts of the state, modeling indicates that water consumption can result in unacceptable impacts to stream flows during dry periods. For analysis locations that are not affected by large reservoirs, unacceptable impacts were determined by looking at low flows during each month, using thresholds from Georgia's low-flow policy. For locations affected by large reservoirs, thresholds for unacceptable impacts came from federal requirements for reservoir releases and minimum stream flows.

At over 40% of the analysis locations, modeling indicates that, during dry periods, there may not be enough water to meet demands for water consumption and also meet minimum flow thresholds. These results provide a warning that water consumption may impact instream uses such as boating and fishing. The regional water plans identify management strategies to address these shortfalls in streamflow.

This figure shows the state's major river basins and the 38 locations where surface water availability was analyzed. Results based on water demands for the year 2050 are summarized for each river basin. The red and black circles show the total number of analysis locations in each river basin and the number with shortfalls in streamflow during dry years. The boxes provide additional information for each basin, including details on the length and size of shortfalls at locations not affected by large reservoirs.

Tennessee River Basin

Existing storage in Tennessee Valley Authority reservoirs can meet future demand but use will require agreements with reservoir owners

CHICKAMAUGA	10	11	437
ENGLAND	7	2	161
LITTLE TENN. RIVER	6	0.6	92

Coosa River Basin

Existing storage in federal reservoirs can meet future demand but use will require agreements with reservoir owners

GAYLESVILLE	9	9	414

Tallapoosa River Basin

NEWELL	10	12	371
HEFLIN	6	4	424

Chattahoochee River Basin

Existing storage in Corps of Engineers reservoirs can meet future demand but use will require agreements with reservoir owners

Flint River Basin

BAINBRIDGE	13	229	5108

Ochlockonee River Basin

CONCORD	10	24	711
QUINCY	11	5	166

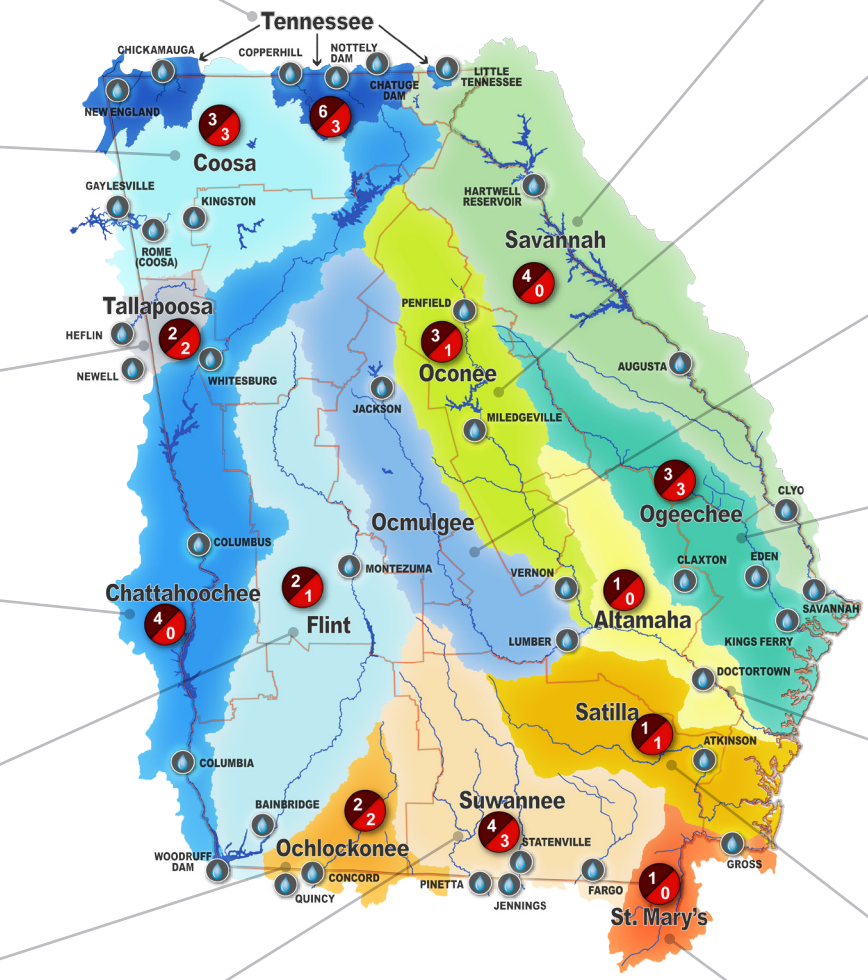
LEGEND

Analysis location and name

3 / 2 — # of analysis locations in basin; # of analysis locations with shortfalls during dry years

For shortfalls at locations not affected by large reservoirs:

NAME	2	34	864
	Percent of days with shortfall	*Average shortfall (millions of gallons per day)*	*Long-term average flow (millions of gallons per day)*



Savannah River Basin

Existing storage in Corps of Engineers reservoirs can meet future demand but use will require agreements with reservoir owners

Oconee River Basin

Existing storage in Georgia Power reservoirs can meet future demand but use will require agreements with reservoir owners

PENFIELD	0.1	42	753

Ocmulgee River Basin

Existing storage in Georgia Power reservoirs can meet future demand but use will require agreements with reservoir owners

Ogeechee River Basin

CLAXTON	17	3	295
EDEN	4	20	1462
KINGS FERRY	4	30	2414

Altamaha River Basin

Surface water is available to meet future demand due to Georgia Power's upstream reservoirs

Satilla River Basin

ATKINSON	7	19	1466

St. Mary's River Basin

Surface water is available to meet future demand

Suwannee River Basin

PINETTA	12	43	1100
STATENVILLE	19	28	681
JENNINGS	14	26	896

Surface Water Quality

Rivers and lakes have a natural ability to process – or assimilate – many pollutants in ways that limit harm to aquatic life or humans who come in contact with the water. This ability, known as assimilative capacity, can be overloaded and violations of water quality standards may result. Water quality standards define the uses of a water body and set limits on pollution to protect those uses.

In the surface water quality assessment, EPD evaluated the capacity of Georgia's surface waters to assimilate pollutants without violating water quality standards.

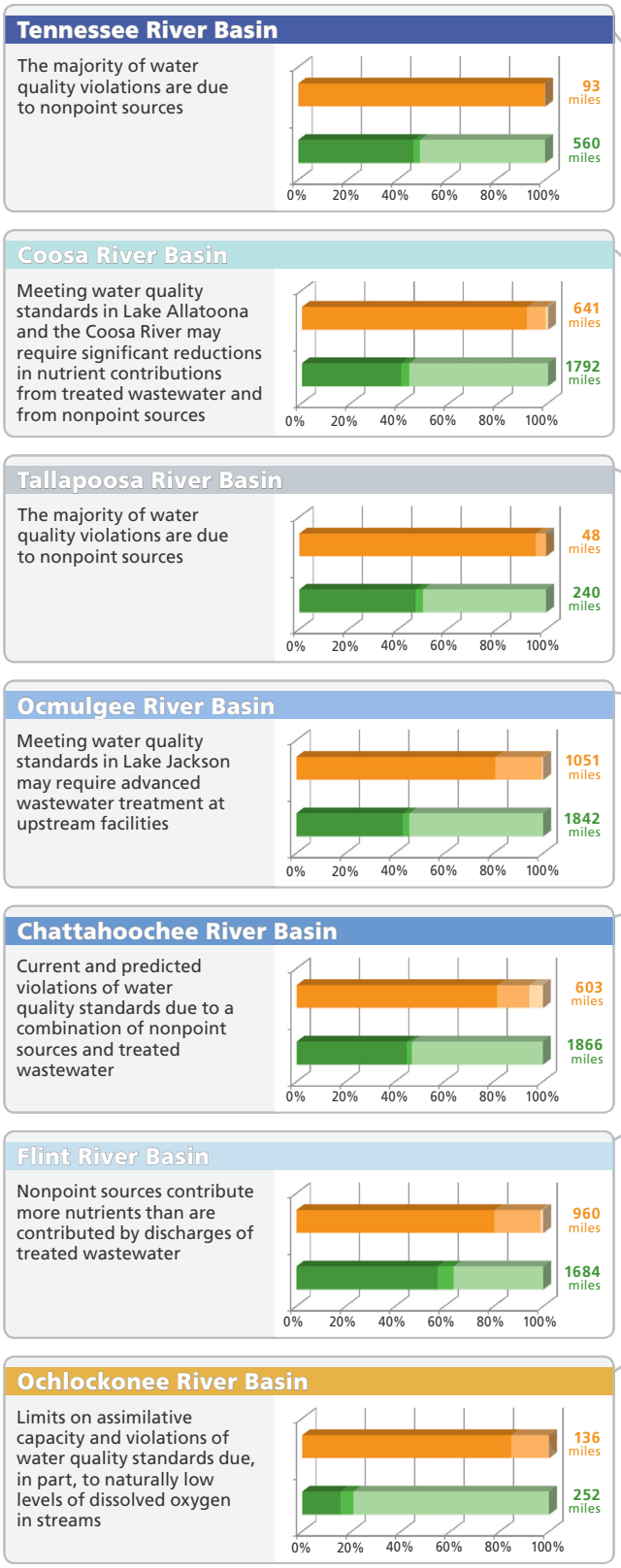
Results indicate that, of the more than 7000 stream miles evaluated statewide, 78% are expected to have good or very good capacity to assimilate additional wastewater. Discharging additional wastewater to the remaining 22%, which have less assimilative capacity, will require higher levels of treatment. Improved wastewater treatment may also be needed at a small number of existing facilities in each river basin.

Results also identified areas where pollutants carried by stormwater, known as nonpoint source pollution, may cause problems in the future. Practices to control nutrients, which can cause excessive growth of algae and aquatic plants, are likely to be beneficial in these areas.

In addition to computer modeling, surface water quality is evaluated through direct monitoring of waters around the state. Every two years, EPD evaluates whether monitored waters meet water quality standards. Water Planning Councils also drew on this information as they considered management of surface water quality in their regions.

This figure summarizes two aspects of water quality for each of the state's major river basins. The orange bars in the graphs show the capacity to assimilate additional wastewater and help meet future demands for wastewater disposal. Results are based on the wastewater demand expected in 2050 and the permit limits needed to meet water quality standards.

The green bars summarize monitored water quality conditions related to a range of pollutants, including bacteria, metals and sediment. These results highlight current water quality challenges, including the impact of pollutants carried in stormwater runoff. The results shown here are from EPD's 2008 list of waters that violate water quality standards, which the Councils used to develop their plans.



LEGEND

WATERSHED
- Modeled
- Not Modeled

LAKE/HARBOR
- Modeled
- Not Modeled

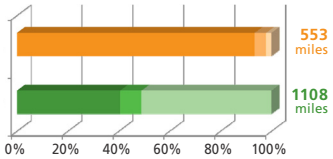
RIVERS
- Modeled
- Not Modeled

CAPACITY TO ASSIMILATE ADDITIONAL WASTEWATER (2050 SCENARIO)
- Miles Modeled
- At Capacity or Exceeded
- Limited to Moderate
- Good/Very Good

MONITORED WATER QUALITY (2008 LIST OF IMPAIRED WATERS)
- Miles Monitored
- Violates Standards
- Assessment Pending
- Meets Standards

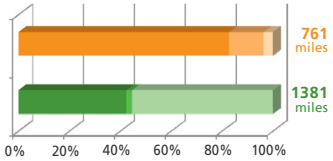
Savannah River Basin

Meeting water quality standards may require reducing the amount of oxygen-depleting waste discharged to the Savannah River



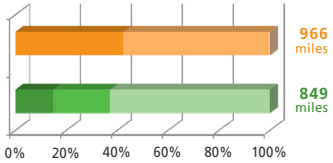
Oconee River Basin

Reductions in nutrients from treated wastewater and nonpoint sources may be needed to maintain water quality in Lakes Oconee and Sinclair



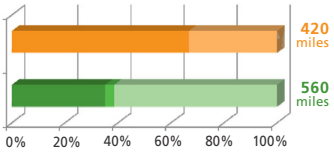
Ogeechee River Basin

Limits on assimilative capacity and violations of water quality standards are due, in part, to naturally low levels of dissolved oxygen in streams



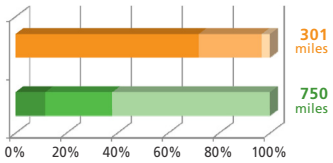
Altamaha River Basin

Limits on assimilative capacity and violations of water quality standards due, in part, to naturally low levels of dissolved oxygen in streams



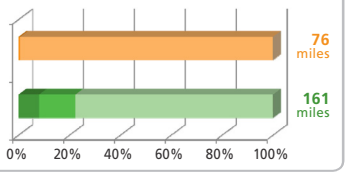
Satilla River Basin

Limits on assimilative capacity and violations of water quality standards due, in part, to naturally low levels of dissolved oxygen in streams



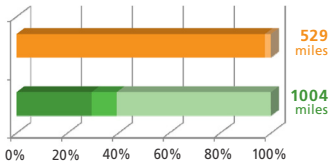
St. Marys River Basin

Limits on assimilative capacity and violations of water quality standards due, in part, to naturally low levels of dissolved oxygen in streams



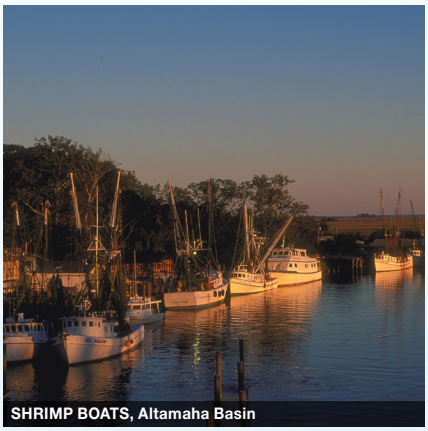
Suwannee River Basin

Limits on assimilative capacity and violations of water quality standards due, in part, to naturally low levels of dissolved oxygen in streams



The characteristics of water resources and water users vary significantly across the state. Meeting future water needs requires regional water plans that fit the resources and users in each region.

Managing Georgia's Waters


SHRIMP BOATS, Altamaha Basin

Through the regional water planning process, people who live and work in each region of the state identified actions, referred to as management practices, necessary to meet current and future water needs. Each Council selected actions based on the results of the forecasts and water resource assessments, described in Sections 2 and 3, as well as their vision and goals for their region's water future.

Management practices will primarily be implemented by local governments, utilities, and other water users who develop infrastructure and apply for permits, grants or loans. The plans provide flexibility, allowing implementers to select from the actions listed in each plan to effectively address local conditions and needs.

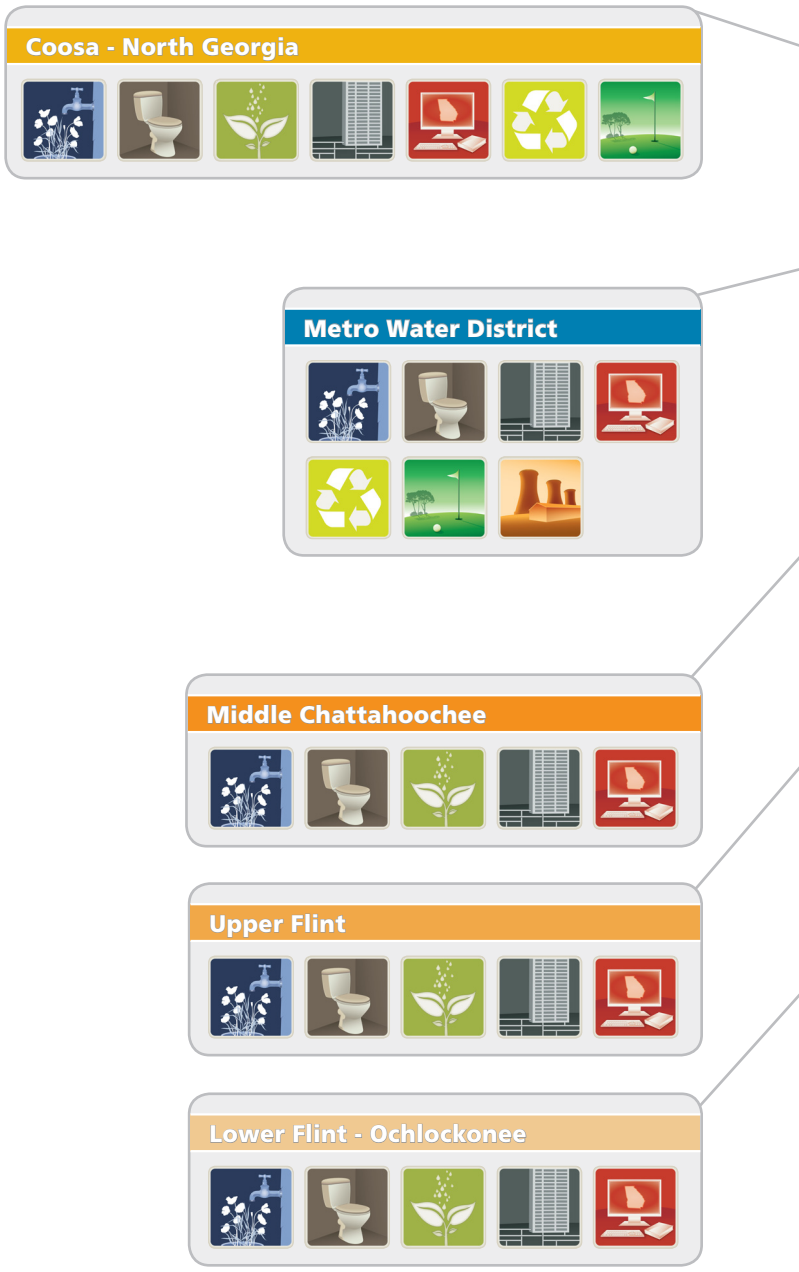
This section provides a high-level overview of the practices in each plan. Much more information can be found in the plans themselves, including priorities, implementation responsibilities, sequencing, and information needs. The plans can be downloaded from **www.georgiawaterplanning.org** or requested by contacting EPD.

FISHING LAKE WALTER F. GEORGE, Chattahoochee Basin

Water Conservation Management

The goal of water conservation is to maximize the benefit from each gallon of water used, helping to ensure that available supply can meet future needs. Georgia's State Water Plan recognizes water conservation as a priority water management practice to be implemented by all water use sectors to help meet needs across the state.

The water conservation practices in each regional water plan are summarized in this figure. Categories were chosen to show the range of practices in each plan, with symbols indicating the sectors or types of water use addressed.



The conservation practices in each plan are based on the condition of the region's water resources, specifics of water use within that region, and the extent that conservation is currently being implemented. The plans generally assume that the more limited a region's water resources, the greater the justification for investments in water conservation.

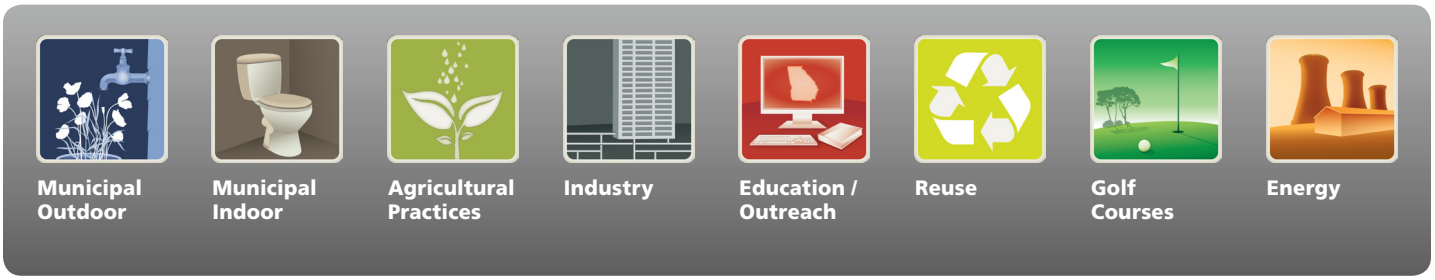
All plans outline voluntary water conservation practices to be implemented by the region's major water users. Practices for municipal and industrial users include water audits, leak reduction, schedules for outdoor watering, and use of more efficient fixtures and processes. For the agricultural sector, practices include steps to improve information on water use and efficiency as well as incentives for implementation of advanced conservation practices. Public education is an important element of each plan.

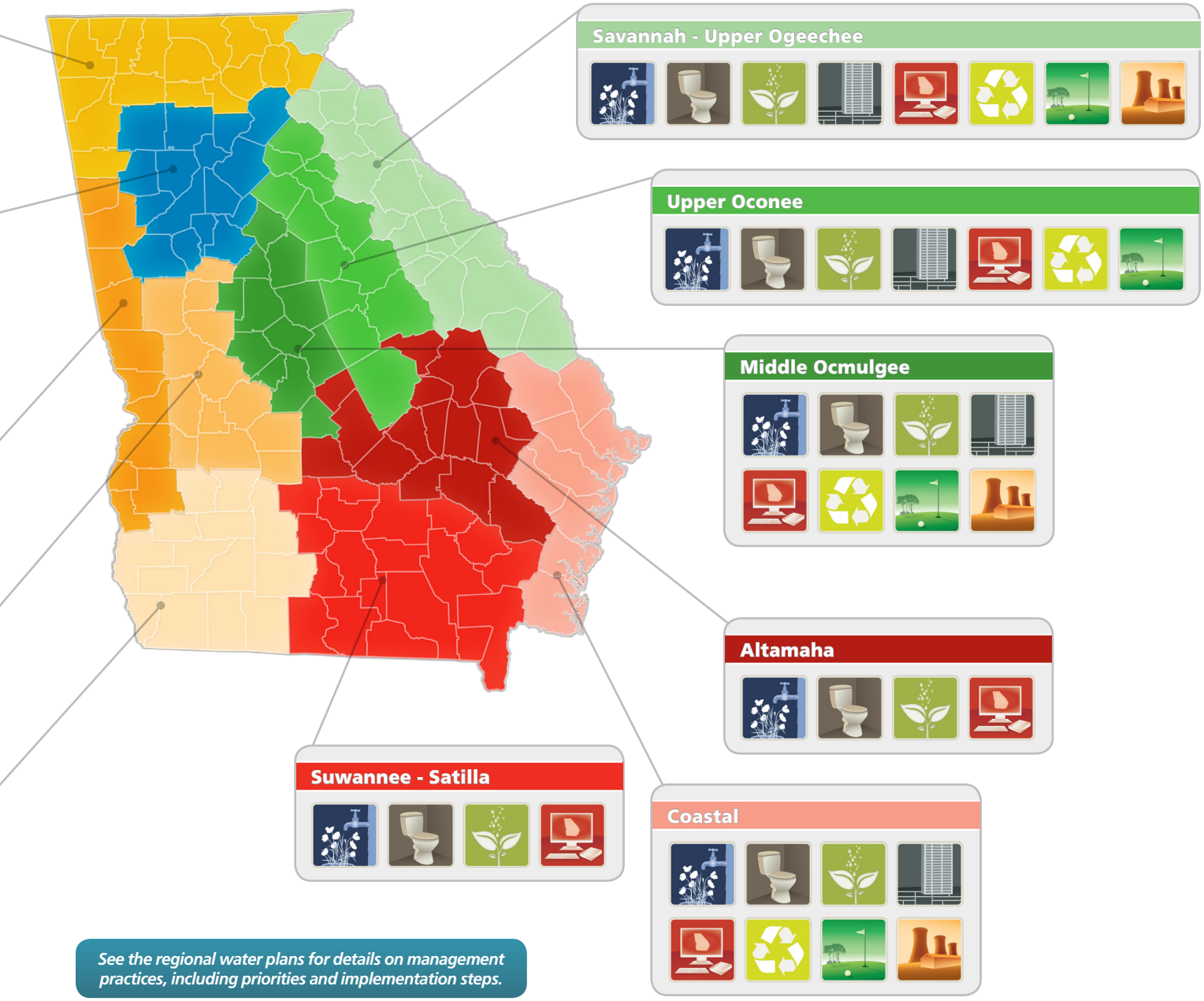
Some plans specify mandatory conservation practices to be implemented by water users in areas with high demand or significant shortfalls in water availability. Some plans also identify benchmarks for achieving performance-based indicators of efficient water use.

Each plan underscores the importance of better information on water use by different sectors. Management practices include actions to help us better understand current levels of water conservation and to document progress toward greater water use efficiency.

Many plans are also supplemented by a technical memorandum documenting the methods used to determine appropriate conservation practices, cost of implementation and potential water savings in the region. Technical memoranda can be downloaded from www.georgiawaterplanning.org or requested by contacting EPD.

Practices





See the regional water plans for details on management practices, including priorities and implementation steps.

Water Supply Management

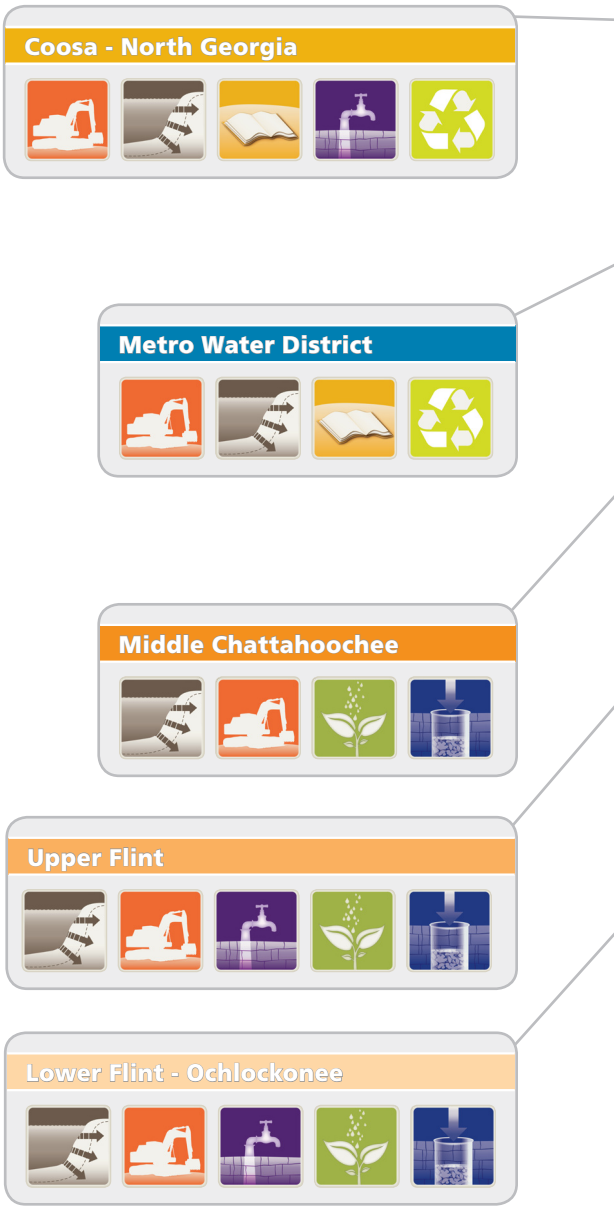
A variety of management practices can help balance water use with the sustainable capacity of water sources. Practices to increase or supplement water supply must work in concert with water conservation practices to meet current and future water supply needs.

This figure shows the categories of water supply actions presented in the regional water plans. Categories were chosen to illustrate the range selected by different Councils, with symbols indicating the activities targeted by practices in each category.

As shown by the symbols, many of the water supply practices address surface water storage. Examples including actions to expand existing reservoirs, use existing storage more effectively, and evaluate new reservoirs. Other practices address alternate sources of water, including increasing use of groundwater and reclaimed water as well as examining the feasibility of desalination of seawater and storing surface water in aquifers for dry weather use. The plans also recognize a need for better information on water use and surface water availability.

Practices to increase water supply can be very expensive and require significant time to put in place. As a result, implementation of these practices will be phased over the 40-year period covered by the plans. Many plans also recommend initial steps to assess need and feasibility of specific practices in specific locations.

In some cases, actions to be taken first could alleviate the need for more expensive practices. Water conservation, for example, can decrease future demand and the effects of conservation activities should be considered when evaluating the need for more expensive water supply practices.



Practices

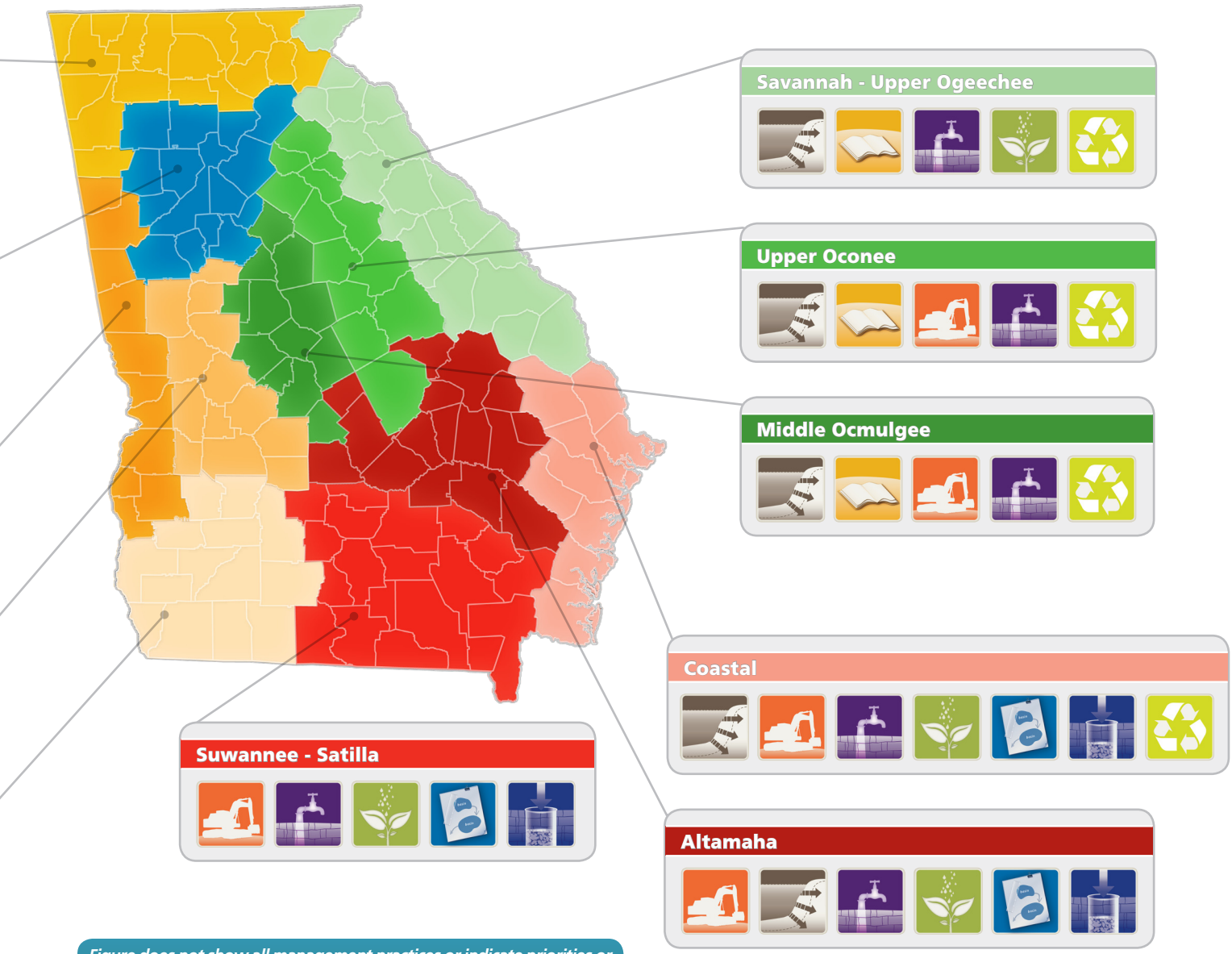


Figure does not show all management practices or indicate priorities or timing of implementation. See the full plans for detailed descriptions of all practices, including priorities and implementation steps.

Wastewater and Water Quality

Wastewater and water quality practices address two different but related challenges. Some focus on ways to meet demand for wastewater disposal while maintaining water quality. Others target the stormwater that carries pollutants into waters from human activities on the land, identifying ways to decrease this nonpoint source pollution.

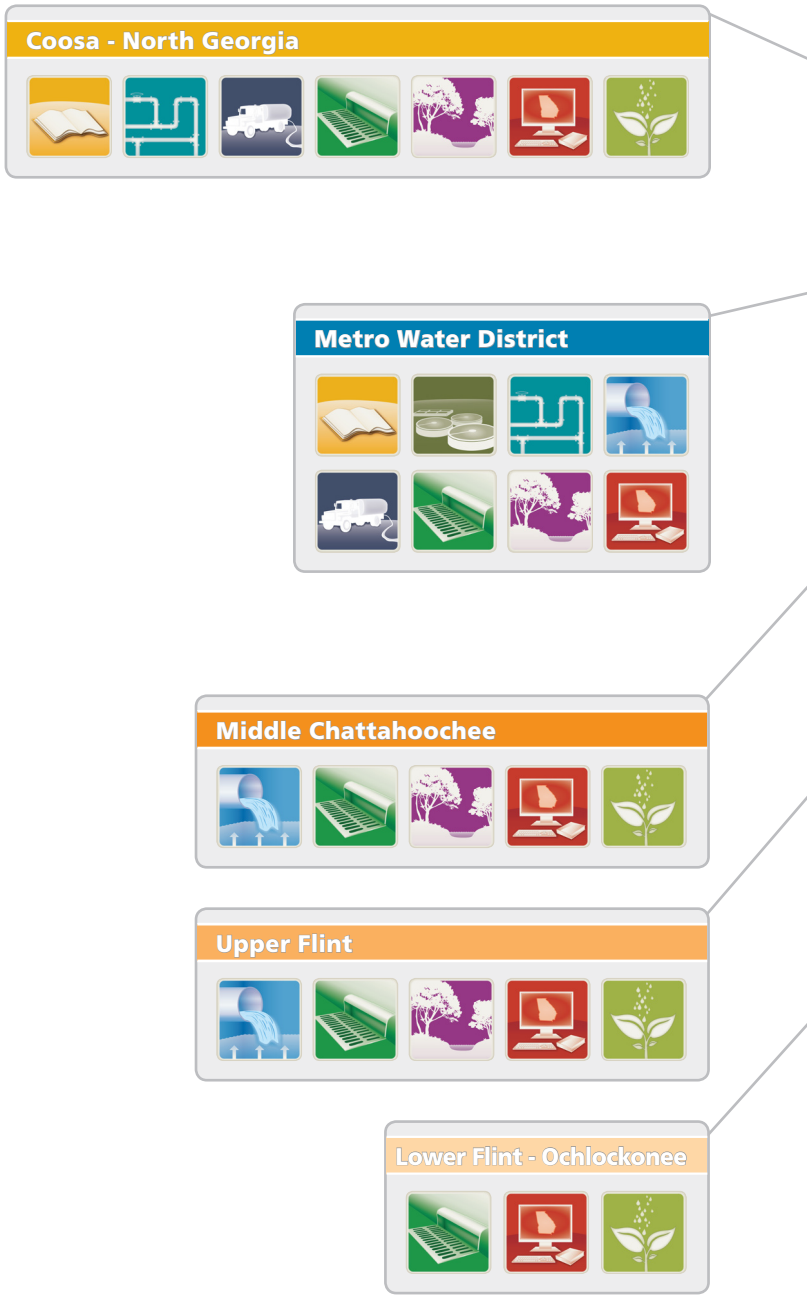
This figure summarizes the actions included in regional water plans to meet demand for wastewater disposal and to protect or restore good water quality.

Practices to meet demand for wastewater disposal include higher levels of wastewater treatment, expanding or constructing new facilities, and improving septic system maintenance and operation. Some plans recommend local master planning as a first step toward prioritizing local actions. Other plans include actions to increase dissolved oxygen in surface waters and prepare for future water quality standards that will limit the level of nutrients in streams and rivers. For some areas, plans also recommend use of wastewater treatment methods that increase the amount of water returned to streams, making more water available for other uses.

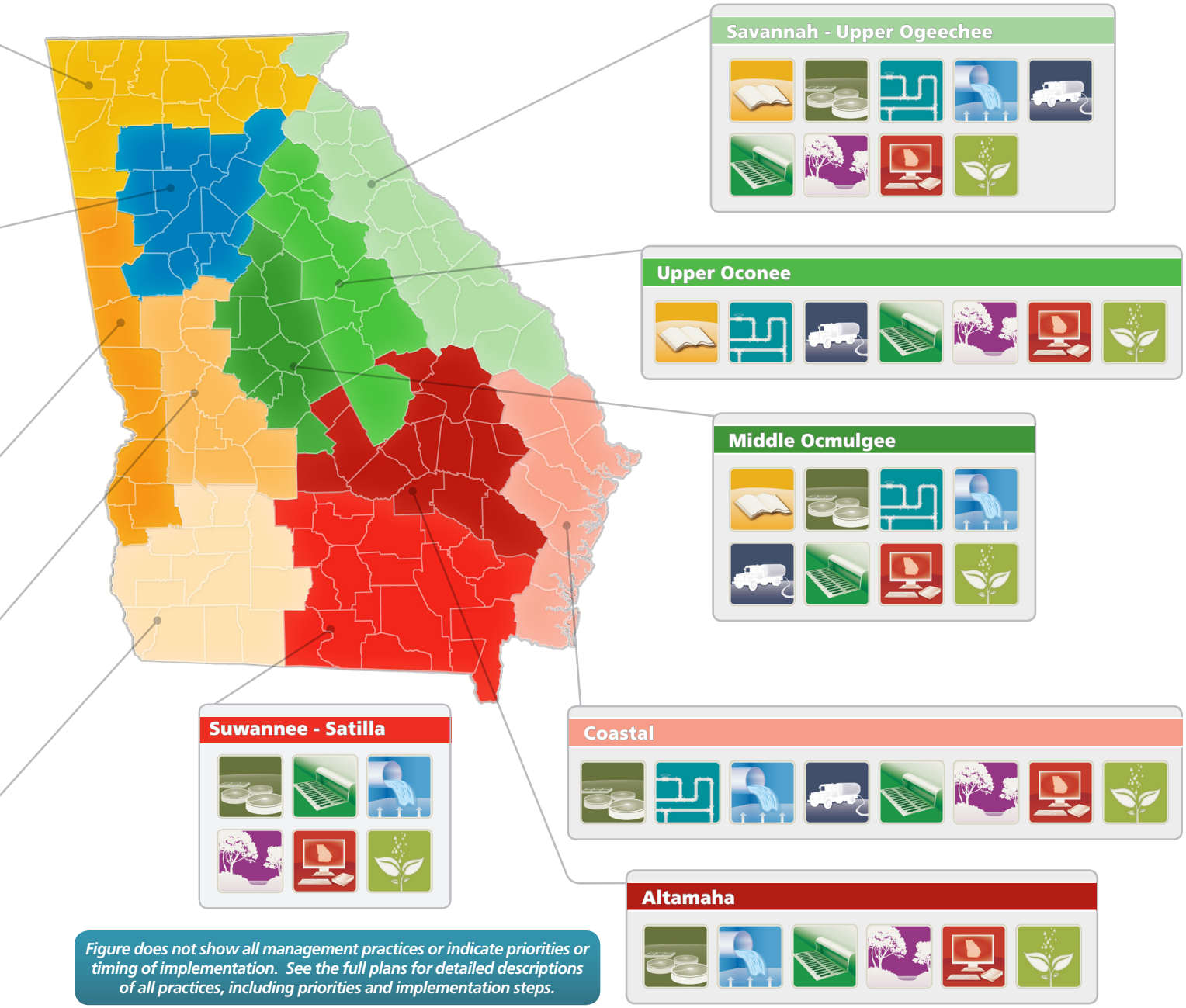
Practices to protect or restore water quality include stormwater ordinances and management programs, local erosion and sedimentation control, stream buffer protection, and actions to decrease runoff from dirt roads, among others. Many of these practices are non-regulatory and best accomplished through incentives, technical assistance, and public education.

Restoration plans have been developed for many of the waters that do not currently meet water quality standards, often focusing on decreasing pollution from stormwater. Regional water plans support these efforts and recommend additional actions, such as coordinated water quality monitoring and adoption of local ordinances, to improve the health of the streams.

Finally, the plans emphasize the need for more complete information to confirm results of water quality modeling and improve targeting of water quality practices.



Management Practices



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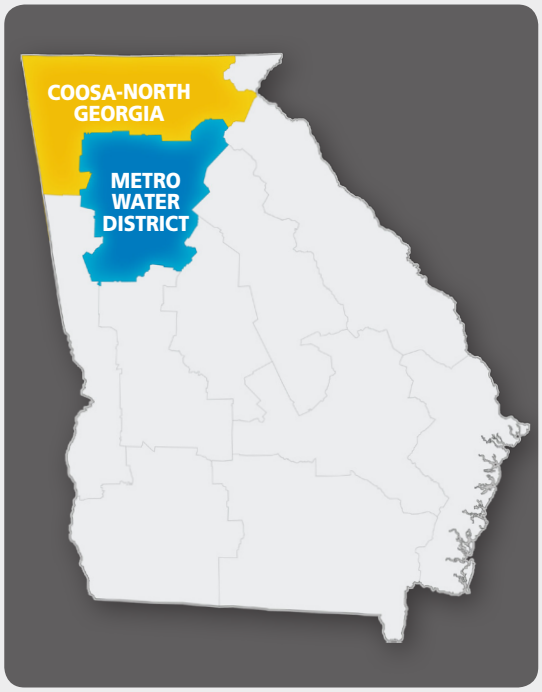
Regional Management Practices



The Coosa-North Georgia Region is comprised of 18 counties and 52 cities. Employment in the region is largely dominated by textile manufacturing. Major water resources include the Coosa River and some of its tributaries, rivers and streams in the Tennessee River basin and Carters Lake and multiple lakes owned by the Tennessee Valley Authority.

The Metropolitan North Georgia Water Planning District was created in 2001 to serve as the water planning entity for the greater Atlanta metropolitan area. The Metro District covers 15 counties and 91 cities. Employment in this region is dominated by trade, transportation and utilities, professional and business services, and government. Major water resources include the Chattahoochee and Coosa rivers, some of their tributaries, and lakes Allatoona and Lanier.

The categories and practices shown here were selected to illustrate the water management approaches taken in each region, but they do not reflect all of the practices in either plan. The regional water plans themselves should be consulted for detailed descriptions of the full suite of management practices.

COOSA-NORTH GEORGIA

In 2005, 92% of the water used in this region came from surface water and 8% from groundwater. The 2010 forecast showed water use in the following sectors: 78% for energy, 15% for municipal users, 5% for industry, and 2% for agriculture.

The Coosa-North Georgia plan presents 42 management practices to address issues related to population growth and land use changes. The plan also focuses on the importance of conservation and water supply.

Water Conservation

Focus on residential, agricultural, and governmental sectors. Provide public education and implement water conservation practices now required by state law.

Water Supply

Develop water master plans first, then expand existing and construct new reservoirs as needed. Encourage new groundwater wells, reuse, and better management of water treatment systems.

Wastewater and Water Quality

Wastewater practices focus on local master plans, public education, septic system management and sewer system maintenance and operation. Water quality practices target nutrient management, erosion and sediment control, stormwater from urban and forestry land, stream buffers and floodplain management, water quality credit trading and addressing waters that don't meet standards.

Information Needs

Refine resource models and improve assumptions about land application systems; study water quality effects of septic systems; obtain better information on agriculture water use, including future demand for golf courses and animal operations.

Recommendations to State

Identify long term funding and implementation mechanisms to support regional planning. Develop guidelines for water quality credit trading, interbasin transfers, and aquifer storage and recovery. Explore the Tennessee River as a water source and support regional reservoir projects.

METRO WATER DISTRICT

In 2006, 99% of the water used in the District came from surface water and 1% from groundwater. The 2010 forecast showed water use by the following sectors: 39% for energy, 54% for municipal users, 2% for industry, and 3% for agriculture.

The legislation that created the District requires three plans for the metro Atlanta area: a water supply and conservation plan, a wastewater management plan, and a watershed management plan. Since adoption of the State Water Plan, the District works within the statewide framework of regional planning, completing current plans in 2009. The District plans present a wide array of management practices, and local governments and some other entities in the District are subject to audits to ensure compliance before water permits, state grants, or state loans are given.

Water Conservation

Practices are very aggressive, including conservation pricing, plumbing retrofits, rain sensors, sub-metering, assessing and reducing leakage, residential and commercial water audits, car wash water recycling, and public education.

Water Supply

Implement planned facilities, including expansion of existing treatment plants as well as construction of new reservoirs and treatment plants. Reuse, local water planning, and education are also included.

Wastewater and Water Quality

Construct, expand, upgrade or retire specific wastewater facilities; inspect, maintain and rehabilitate wastewater systems; enhance septic system management and education. Water quality practices address watershed planning; alternative ways to develop land; maintenance of sewer pipes, ponds and other structures; pollution prevention; and education.

Information Needs

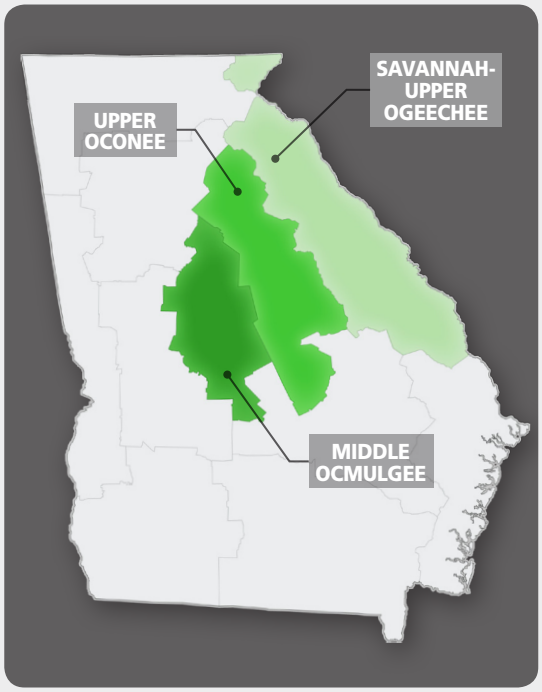
Research restricting sale of certain fertilizers; update the Georgia Stormwater Management Manual; evaluate and compile watershed monitoring data; and assess viability of a web-based electronic data management center.

Recommendations to State

Streamline water permitting and reporting; consider incentives and financial support; coordinate land use planning and water planning; ensure water supply buffers are adopted and enforced; track septic system installation and revise maintenance requirements; enhance septic limitations in critical areas and enforcement of laws for septic systems; meet stormwater criteria for road designs and implement transportation capital improvements to address runoff.

ALLATOONA DAM, Coosa Basin

Regional Management Practices



The Middle Ocmulgee Region is comprised of 12 counties and 28 cities. Leading employment sectors include government, health care, service industries, and agriculture. Major water resources include the Ocmulgee River, some of its tributaries, lakes Jackson and Juliette, and the Cretaceous and Upper Floridan aquifer systems.

The Upper Oconee Region is comprised of 13 counties and 62 municipalities. Leading employment sectors include government, health care, manufacturing, retail, and construction. Major water resources include the Oconee River, some of its tributaries, lakes Oconee and Sinclair, and the Cretaceous and Upper Floridan aquifer systems.

The Savannah-Upper Oconee Region is comprised of 20 counties and 67 municipalities. Leading employment sectors include government, health care, manufacturing, retail and construction. Major water resources include the Savannah and Ogeechee rivers, some tributaries, and lakes Hartwell, Russell, and Thurmond as well as the crystalline rock, Cretaceous, Gordon and Floridan aquifer systems.

The categories shown here allow a common presentation of information from the different plans but do not reflect the categories in each plan. The full plan for each region should be consulted for detailed descriptions of all management practices.

MIDDLE OCMULGEE

In 2005, 60% of the water used in this region came from surface water and 40% from groundwater. The 2010 forecast showed water use in the following sectors: 29% for energy, 32% for municipal users, 16% for industry, and 23% for agriculture.

This plan describes 35 management practices. The 20 practices identified as priorities are summarized here. The plan recognizes master planning for water, wastewater and stormwater as a first step toward prioritizing local actions. Developing a regional educational program for local implementation was recommended for all categories of management practices.

Water Conservation

Implement water conservation practices in the Water Stewardship Act; evaluate applicable practices in the Water Conservation Implementation Plan

Water Supply

Develop local water master plans.

Wastewater and Water Quality

Develop local wastewater master plans; coordinate water quality monitoring; upgrade existing and construct advanced treatment facilities; promote coordinated environmental planning; reduce impervious surface runoff; adopt ordinances or incentives to protect sensitive land; implement watershed protection plans and projects to restore substantially impacted watersheds.

Information Needs

Evaluate surface water availability at more locations; additional monitoring of streams with low capacity to assimilate pollutants; more research on emerging contaminants and nutrient input to reservoirs.

Recommendations to State

Public education and outreach; continue to support Council operations; evaluate instream flow policy and assumptions in the resource assessments; use monitoring to inform future nutrient policy; identify long-term funding for plan implementation; coordinate data collection to inform future water planning.

UPPER OCONEE

In 2005, 94% of the water used in this region came from surface water and 6% from groundwater. The 2010 forecast showed water use in the following sectors: 87% for energy, 5% for municipal users, 4% for industry, and 4% for agriculture.

The Upper Oconee Plan lists 38 management practices targeted toward areas with current or future shortages in water supply or wastewater capacity. Management practices were prioritized based on resource need or benefit ranking of the practice. Representative practices are listed to the right.

Water Conservation

Encourage conservation pricing; develop conservation goals; consistently meter and report agricultural withdrawals; implement education programs for the public and specific water use sectors.

Water Supply

Expand existing or construct new reservoirs; expand existing withdrawals from reservoirs; develop new groundwater wells; encourage master planning, indirect potable reuse, leak detection and maintenance of sewer pipes, ponds, and other structures

Wastewater and Water Quality

Encourage centralized sewers in developing areas where density warrants; encourage master planning; develop guidelines for septage disposal; encourage comprehensive land use planning, local erosion and sediment control, agricultural and forestry management practices, and stream buffer protection

Information Needs

Monitor long-term trends in water quality, habitat and biological communities.

Recommendations to State

Identify long-term funding for implementation and incentives; coordinate plan implementation; continue to support Council operation; develop policies for decentralized sewers; explore changes to erosion and sediment law exemptions; improve resource assessment models; evaluate current in-stream flow policy

SAVANNAH-UPPER OGEECHEE

In 2005, 78% of the water used in this region came from surface water and 22% from groundwater. The 2010 forecast showed water use in the following sectors: 21% for energy, 28% for municipal users, 27% for industry, and 24% for agriculture.

The plan for this region describes a total of 30 management practices. Sixteen are identified as priorities to address water resource needs or shortfalls. The plan recognizes master planning as a first step toward prioritizing local actions and also provides recommendations for state actions to support plan implementation. Priority practices and recommendations to the state are summarized to the right.

Water Conservation

Implement basic practices required by state law and regulations; encourage additional water conservation practices for all sectors.

Water Supply

Develop local water master plans, use groundwater where surface water is limited, decrease surface water use during low flows, and increase returns.

Wastewater and Water Quality

Develop local wastewater master plans, construct or upgrade treatment facilities, develop or implement restoration plans for waters that violate water quality standards.

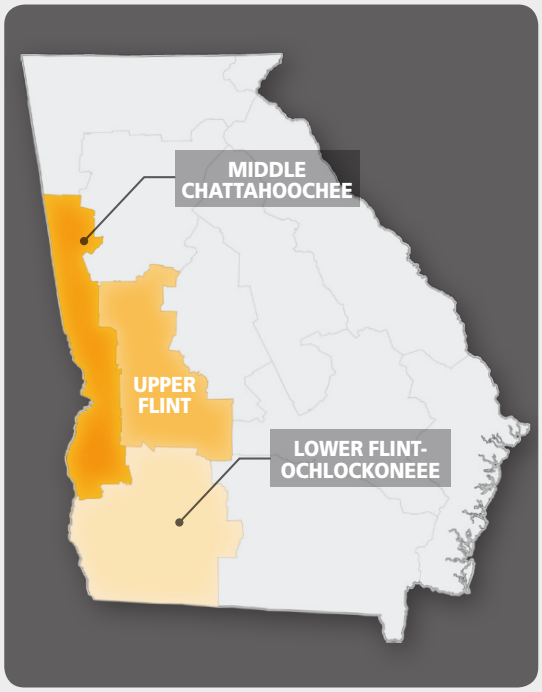
Information Needs

Monitor agricultural withdrawals, conduct instream flow studies, and confirm number and size of shortfalls in surface water availability.

Recommendations to State

Fund implementation of regional water plans, agricultural metering, and ongoing comprehensive Savannah Basin studies; compile additional data on surface water flows, agricultural withdrawals, and water quality; conduct site-specific flow studies; study instream flow policy; coordinate with South Carolina and federal agencies; develop regional education materials.

Regional Management Practices



The Middle Chattahoochee Region is comprised of 11 counties and 34 municipalities. Leading employers include manufacturing and government facilities. Major water resources include the Chattahoochee River, lakes West Point and Walter F. George and the Cretaceous, Clayton, Claiborne and Floridan aquifer systems

The Upper Flint Region is comprised of 13 counties and 48 cities. Agriculture is the leading economic sector and water user in the region. Major water resources include the Flint River, some of its tributaries and the Cretaceous, Clayton, Claiborne and Floridan aquifer systems.

The Lower Flint-Ochlocknee Region is comprised of 14 counties and 50 cities. Agriculture is the leading economic sector and water user in this region as well. Major water resources include the Flint River, some of its tributaries, and the Clayton, Claiborne and Floridan aquifer systems.

Representative management practices are summarized below. The full plans should be consulted for a comprehensive list, including joint recommendations from the three Councils.

MIDDLE CHATTAHOOCHEE

In 2005, 91% of the water used in this region came from surface water and 9% from groundwater. The 2010 forecast showed water use in the following sectors: 44% for energy, 39% for municipal users, 2% for industry, and 15% for agriculture.

The plan recommends 22 management practices to address current or future shortfalls or needs and achieve the Council's vision. Shortfalls include Council-identified impacts resulting from operation of reservoirs by the US Army Corps of Engineers. Actions focus on improving operations of existing reservoirs and studying new or enhanced storage.

Water Conservation

Implement basic water conservation practices; encourage conservation-oriented water rates and education programs.

Water Supply

Study new or enhanced use of existing surface water storage; continue use of farm ponds; increase returns of wastewater from treatment facilities; encourage water system interconnections and drought contingency planning; consider use of aquifer storage and recovery.

Wastewater and Water Quality

Improve water quality monitoring, increase funding for erosion and sedimentation control, enforce stream buffers, and encourage local adoption of Georgia Stormwater Management Manual. Evaluate and encourage increased use of best management practices by major water users.

Information Needs

Improve understanding of water returns from agricultural irrigation, land application systems and septic systems. Determine scientifically-based minimum flow targets. Improve forecasting of water demand for energy and water use in Alabama.

Recommendations to State

Advocate for recommended changes in operations of Corps of Engineers' reservoirs and for funding to improve resource assessments and implementation of management practices. Study delegation of water management authority to regional Councils and how Councils would work under interstate compact. Conduct peer review of water quality models.

UPPER FLINT

In 2005, 36% of the water used in this region came from surface water and 64% from groundwater. The 2010 forecast showed water use in the following sectors: 0% for energy, 15% for municipal users, 9% for industry, and 76% for agriculture.

The plan outlines 18 management practices focused on current and future shortfalls in water availability, water conservation, and water quality. Management practices focus on shortfalls in surface water availability due to water consumption and a lack of storage to meet water needs during droughts.

Water Conservation

Improve metering of agricultural water use; implement basic water conservation for farm and non-farm use; provide incentives for advanced water conservation. Continue farm withdrawal permitting under 2006 Flint River Basin Plan.

Water Supply

Evaluate reservoir storage options. Use groundwater to augment stream flow or replace surface water use. Consider aquifer storage and recovery and encourage continued development of farm ponds. Limit development of new land application systems.

Wastewater and Water Quality

Improve enforcement of existing permits and regulations for erosion and sediment control. Encourage use of practices from the Georgia Stormwater Management Manual and consider land conservation programs to improve stream buffers.

Information Needs

Improve resource assessment models and evaluate impacts of low flows as measured at Bainbridge. Evaluate current use of water conservation and water quality best management practices; study impacts of irrigation, reservoirs, and farm ponds on regional hydrology; evaluate scientific basis for minimum flow requirements below Woodruff Dam.

Recommendations to State

Provide funding to support Water Planning Councils and incentives for implementation of management practices. Continue voluntary irrigation suspension under existing law. Provide legal authority and funding to Councils for water management and oversight.

LOWER FLINT-OCHLOCKONEE

In 2005, 36% of the water used in this region came from surface water and 64% from groundwater. The 2010 forecast showed water use in the following sectors: 13% for energy, 6% for municipal users, 14% for industry, and 67% for agriculture.

The plan outlines 17 management practices to address current and future shortfalls in water availability, water conservation, and water quality. Management practices focus on shortfalls in surface water availability due to water consumption and a lack of storage to meet water needs during droughts.

Water Conservation

Improve agricultural water use efficiency; implement basic water conservation for farm and non-farm use; provide incentives for advanced water conservation; study benefits of irrigation institutions.

Water Supply

Evaluate storage options. Use groundwater to augment stream flow or replace surface water use. Evaluate aquifer storage and recovery; continue farm pond development programs.

Wastewater and Water Quality

More effective coordination and use of existing state water quality resources. Conduct baseline survey of agricultural BMP implementation. Encourage use of practices from the Georgia Stormwater Management Manual. Improve water quality monitoring to support future planning.

Information Needs

Evaluate impacts of low flows as measured at Bainbridge. Improve metering of agricultural water use. Evaluate effectiveness of water conservation practices and scientific basis for minimum flow requirements below Woodruff Dam. Improve water quality models.

Recommendations to State

Provide funding to support Councils and incentives for implementation of management practices. Continue voluntary irrigation suspension under existing law. Do not modify existing permits based on resource assessment results. Authorize and fund Council work on threatened and endangered species. Provide legal authority and funding to Councils for water management and oversight.

Regional Management Practices

The Suwanne-Satilla Region is comprised of 18 counties and 43 cities. Agriculture and forestry are the major economic drivers in the region. Major water resources include the Suwannee, Satilla, and St. Marys rivers, some of their tributaries and the Floridan aquifer system.

The Altamaha Region covers 16 counties and 56 cities. Leading economic sectors in the region include agriculture and forestry. Major water resources include the Altamaha River, some of its tributaries and the Floridan aquifer system.

The Coastal Region is comprised of 9 counties and 30 cities. Dominant economic sectors include government, tourism, trade, transportation, and utilities among others. Major water resources include the Savannah, Ogeechee, Altamaha, Satilla and St. Marys rivers and some of their tributaries as well as the Brunswick and Floridan aquifer systems.

The categories shown here allow a common presentation of information from the different plans and do not reflect the categories in each plan. The complete plans should be consulted for detailed descriptions of all management practices.

SUWANNEE-SATILLA

In 2005, 27% of the water used in this region came from surface water and 73% from groundwater. The 2010 forecast showed water use in the following sectors: 0% for energy, 19% for municipal users, 6% for industry, and 75% for agriculture.

The Suwannee-Satilla plan identifies 76 management practices to address current and future shortfalls and needs. The plan also provides specific recommendations to the State to support successful implementation.

Water Conservation

Implementation of Water Stewardship Act; evaluate practices from the Water Conservation Implementation Plan; promote water conservation education and programs.

Water Supply

Consider low-flow conditions in future surface water permitting; provide dry-year pond releases; undertake sustainable groundwater development; increase wastewater return increases; explore interbasin transfers.

Wastewater and Water Quality

Relocate wastewater discharge locations; enhance wastewater treatment; increase permitted wastewater capacity; implement non-point source practices for appropriate sectors or land uses (agriculture, urban, forestry, rural); link nutrient loading to current land use.

Information Needs

Refine agricultural consumption data; collect water quality data from all water use sectors; research groundwater sustainability and aquifer potential to address shortfalls; improve data quality and analysis capabilities; irrigation efficiency education and research.

Recommendations to State

Focus on education, incentives, collaboration, cooperation, and enabling and supporting plan implementers. Institutionalize water planning. Focus funding and permitting assistance on projects and programs for areas with shortfalls.

ALTAMAHA

In 2005, 45% of the water used in this region came from surface water and 55% from groundwater. The 2010 forecast showed water use in the following sectors: 20% for energy, 10% for municipal users, 24% for industry, and 46% for agriculture.

The Altamaha Plan describes 71 management practices targeted toward current and future needs. Actions for surface and groundwater are grouped and listed by the water use sectors that will implement them. The Plan also includes practices for resources shared with other regions. Representative practices are summarized here.

Water Conservation

Implement practices in Water Stewardship Act; evaluate practices for agricultural water use in areas with shortfalls in streamflow; promote conservation education programs.

Water Supply

Provide incentives for dry-year releases from farm ponds, groundwater development, wetland restoration, and increases in wastewater returns. Study feasibility of multi-region reservoir, interbasin transfers, and aquifer storage and recovery.

Wastewater and Water Quality

Relocate wastewater discharges; increase permitted wastewater capacity; monitor nutrient pollution; implement nutrient management practices.

Information Needs

Study human impacts on water quality; refine agricultural consumption data; research groundwater potential to address surface water shortfalls; irrigation efficiency education and research; study impacts of wetland restoration on streamflow; monitor and evaluate estuaries.

Recommendations to State

Focus on education, incentives, collaboration, cooperation, and enabling and supporting plan implementers; institutionalize and fund water planning; focus funding and assistance on areas with shortfalls; continue monitoring to help conserve Georgia's natural, historic, and cultural resources

COASTAL GEORGIA

In 2005, 72% of the water used in this region came from surface water and 28% from groundwater. Surface water use reflects large withdrawals for thermoelectric power facilities in the region. The 2010 forecast showed water use in the following sectors: 57% for energy, 14% for municipal users, 27% for industry, and 2% for agriculture.

The plan for this region identifies 86 management practices to address current and future water resource needs in nine coastal counties. The plan also provides specific recommendations to the State to aid in the successful implementation of the plan.

Water Conservation

Implement basic water conservation practices for all municipal and industrial water users; implement advanced conservation practices for all agricultural users and for municipal and industrial users in areas affected by movement of saltwater into the Upper Floridan aquifer.

Water Supply

Alternate groundwater sources and engineering controls to address saltwater intrusion, use groundwater to address shortfalls in streamflow, evaluate feasibility of aquifer storage and recovery, evaluate feasibility of desalination, increase aquifer recharge, and increase wastewater returns.

Wastewater and Water Quality

Support current wastewater discharge permitting process and existing programs for implementation of best management practices, encourage stormwater ordinances and septic system maintenance.

Information Needs

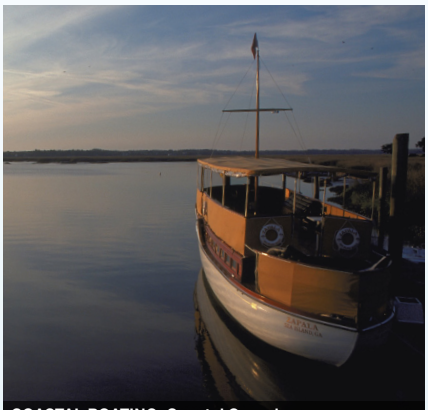
Confirm shortfalls in surface water availability, wastewater discharge characteristics and receiving stream chemistry, and causes of nonpoint source pollution.

Recommendations to State

Institutionalize planning, support the stakeholder processes addressing the Savannah Harbor and saltwater intrusion, improve agricultural water use data, standardize water use data, continue coordination between state agencies and with South Carolina and Florida.

Georgia's continued prosperity and quality of life are tied to how we collectively manage our water resources.

A State-wide Effort


COASTAL BOATING, Coastal Georgia

As the state's population and economy grow, demands on the state's waters grow as well. Over the past several decades, decisions about water management in Georgia were made largely in response to specific issues or needs. Meeting future water challenges will require a more proactive, comprehensive, and cooperative approach.

To that end, Georgia's 2008 State Water Plan calls for on-going water planning that incorporates local and regional perspectives to ensure that the state's water resources are sustainably managed.

In February of 2009, the Governor, Lieutenant Governor, and Speaker of the House appointed the 300 members of the ten new Water Planning Councils. The Councils spent the next two and a half years learning about their region's water resources, developing a regional vision and goals, refining assessments and forecasts, and identifying strategies for water management. Using this information and working with a range of stakeholders including neighboring Councils, the Councils prepared the plans described in this document.

With the plans already completed by the Metro District, Georgia now has a state-wide base of regional water plans that build on local and regional perspectives to identify the most appropriate ways to meet water needs through 2050.

SPREWELL BLUFF STATE OUTDOOR RECREATION AREA, Flint Basin

A Decade of Water Planning in Georgia

With completion of the regional water plans, Georgia is ready to embark on its second decade of strategic water resource planning. This figure shows major milestones to date in Georgia's statewide and regional water planning.

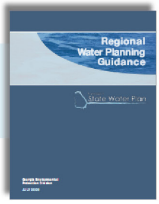
September 2011: Regional Water Plans adopted

2011

March 2010: EPD released the Water Conservation Implementation Plan

2010

January 2010: EPD released initial results from assessments of groundwater availability, surface water availability, and surface water quality



July 2009: EPD issued Regional Water Planning Guidance

May 2009: The Metro Water District revised their plans

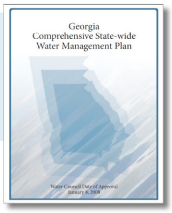
2009

March 2009: Kick-off of regional water planning under the State Water Plan. Water Planning Councils begin meeting at least quarterly

Regional Water Planning Rules adopted by Board of Natural Resources

2008

2008: The State Water Plan was adopted by the General Assembly, establishing a framework for regional water planning



2004: Georgia's Comprehensive State-wide Water Planning Act was passed, directing EPD and the Water Council to prepare Georgia's Comprehensive State-wide Water Management Plan (State Water Plan)

2004

2003

2003: Metro Water District prepared and adopted three regional water plans: Watershed Management Plan, Long-term Wastewater Management Plan, and Water Supply and Water Conservation Management Plan

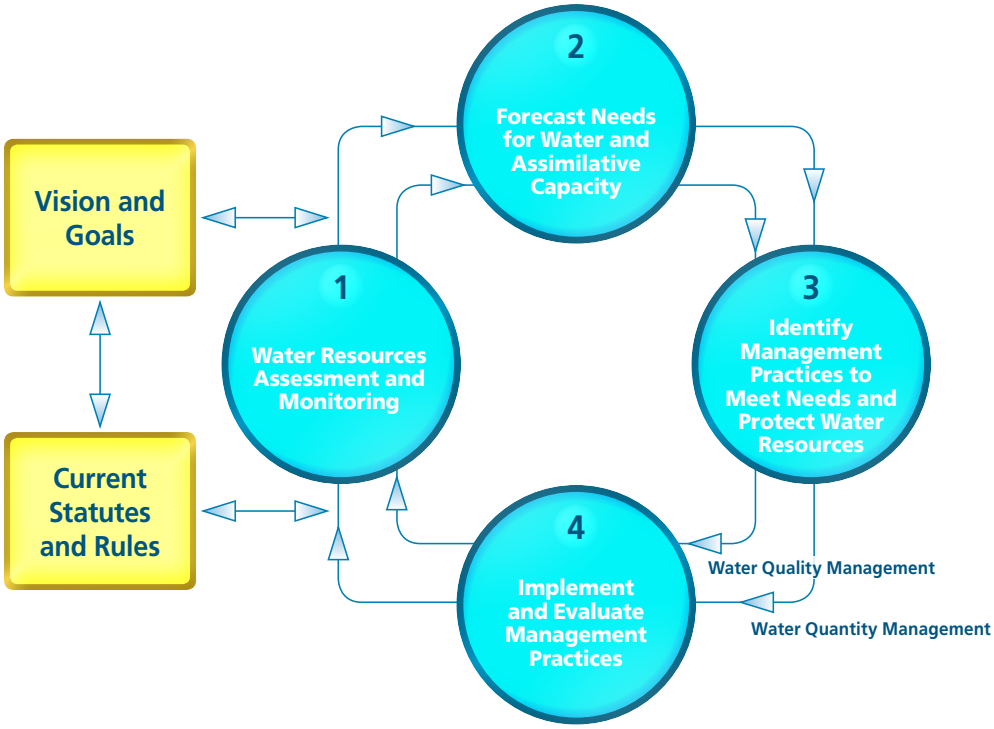
2001

2001: Metropolitan North Georgia Water Planning Act was passed, creating the Metropolitan North Georgia Water Planning District (Metro Water District)

The Water Planning Process

The State Water Plan established innovative approaches to water management in Georgia. An ongoing process for regional water planning is central to this effort.

This figure depicts Georgia's comprehensive water planning cycle. The approach emphasizes flexibility, allowing state agencies, Water Planning Councils, water users, and others to adapt as new circumstances and information arise. The approach ensures that regional differences, as reflected in water needs and the condition of regional water resources, are integral considerations in management decisions.



Over the past three years, the Water Planning Councils, the Environmental Protection Division, and other state agencies have put this cycle in motion, helping Georgia take an important step forward in water management. The Councils' have considered information on the condition of water resources in their region (Item #1 above) along with information on the anticipated water needs (Item #2 above). They then identified actions that, when implemented, will help ensure that each region's water resources can sustainably meet water needs, now and in the future (Item #3 above). Each Council's vision and goals for their regional water future served a frame of reference as they prepared their recommendations.

The next steps are to implement the regional water plans and evaluate the effect of the practices that are put in place. And, as the regional water plans recognize, it will be important that we continue to improve information on water needs and the condition Georgia's water resources. This information will be the starting point for a renewed look at regional water plans in 2016 when, as the State Water Plan requires, Water Planning Councils will review their plans and revise them as needed.

Outreach, Input, and Collaboration


REGIONAL WATER PLANNING COUNCILS JOINT MEETING


OXBOW MEADOWS EDUCATION CENTER, Chattahoochee Basin


CITY OF ALPHARETTA'S ROCK MILL PARK, Chattahoochee Basin

Just as water resources are interconnected, the Councils could not do their work in isolation. Over the past three years, the Councils and EPD actively used outreach, input, and collaboration to build the information base for decision making. These activities strengthened connections between water users while promoting a better understanding of local, regional, and statewide issues.

These interactions also helped lay a foundation for activities to implement each plan. Local governments and others who develop water infrastructure and apply for water-related permits, grants and loans will be the primary implementers. Consideration of local perspectives as plans were prepared was essential.

Each Council prepared a public involvement plan to ensure the participation of local governments and other water users in their region. Councils also held outreach meetings with local governments to discuss the management practices under consideration. The goal was to ensure that municipal and county officials understood and contributed to the draft recommendations.

Technical experts from major water use sectors (municipal, industrial, agriculture, and energy) provided input on forecasts of water demand, helping forecasts reflect on-the-ground realities. Some Councils also involved experts from their region on subcommittees that aided in development of recommendations.

The Metro Water District also actively engages local governments and water users in their region. A technical committee, comprised primarily of local officials, and basin councils provide input to District plans and policies.

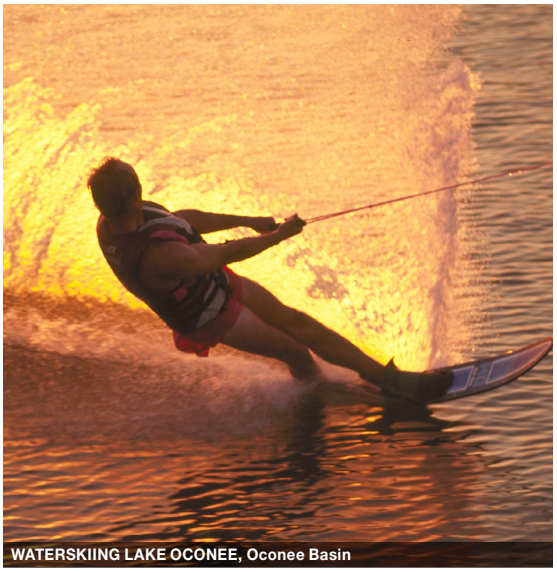
In addition to interactions within each region, the Councils, Metro Water District, and EPD worked to ensure coordination among adjacent regions and regions with shared water resources. Joint meetings between Councils and the Metro Water District began in January 2010. During the 19 months that followed, more than ten state-wide or multi-region meetings were held to discuss the condition of shared water resources, exchange ideas for management practices, and explore how actions in one region might affect shared resources.

Finally, Councils whose regions border neighboring states worked with those states to incorporate information on the use and management of shared waters.

As reflected in most of the comments submitted during public review of the draft plans, these interactions have helped Georgia take meaningful strides forward in management of our valuable water resources – due in no small part to the outreach, input, and collaboration activities of the Councils and the Metro Water District.

Next Steps

Georgia's eleven regional water plans outline practical approaches to short-term and long-term water resource management. The plans also identify the entities expected to take specific steps to help ensure the sustainable management of our water resources.



WATERSKIING LAKE OCONEE, Oconee Basin

CANOEING GENERAL COFFEE STATE PARK, Satilla Basin

Local and Regional Water Users Will Implement Plans. Implementation is primarily the responsibility of local governments, water utilities, industries, and land owners who use water and develop water infrastructure. To assist local water managers, the Councils took a menu-oriented approach to management practices. The menu of practices in each plan can guide water managers in the region as they expand or develop new programs or facilities to address local conditions and needs. Shorter-term practices that address more immediate needs are emphasized, with more complex or expensive practices to be evaluated for subsequent implementation, if warranted.

Plans Will Guide State Decisions on Permits, Grants and Loans. State law requires that the regional water plans guide state agency decisions on water permits and grants and loans for water-related projects. When considering applications for water permits, EPD will consult the regional water plans at the outset, with the plans providing a framework for consideration throughout permit evaluation. Permit decisions will continue to be based on the existing framework of laws, rules, and guidance, and the plans are an important new source of information for EPD permitting programs. The Georgia Environmental Finance Authority and Department of Community Affairs will also consult the regional water plans as they consider applications for water-related state grants and loans.

State to Enhance Modeling, Monitoring and Data Collection. Over the past three years, the State made significant investments in modeling tools and monitoring networks to improve information and decisions. The Councils strongly recommend that the State continue and expand these efforts. EPD will take the lead, coordinating with other state agencies, the Councils, and other interested parties as we continue to improve the tools and information base for water planning and management.

Review and Revision of Regional Water Plans. The five-year review and revision by each Water Planning Council and the Metro Water District will provide an opportunity to evaluate benchmarks and revise management practices to more effectively address water issues and needs. It will also provide an opportunity to respond to new information or changed circumstances.

It is now time to put the regional water plans into action, building on the progress made through collaboration within and among the Water Planning Councils and the Metro Water District. Water users, water providers, local governments, state agencies, and elected leaders all have an important role in actions to ensure that Georgia's waters are sustainably managed to support the state's economy, protect public health and natural systems, and enhance the quality of life for all citizens.

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State Water Plan

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