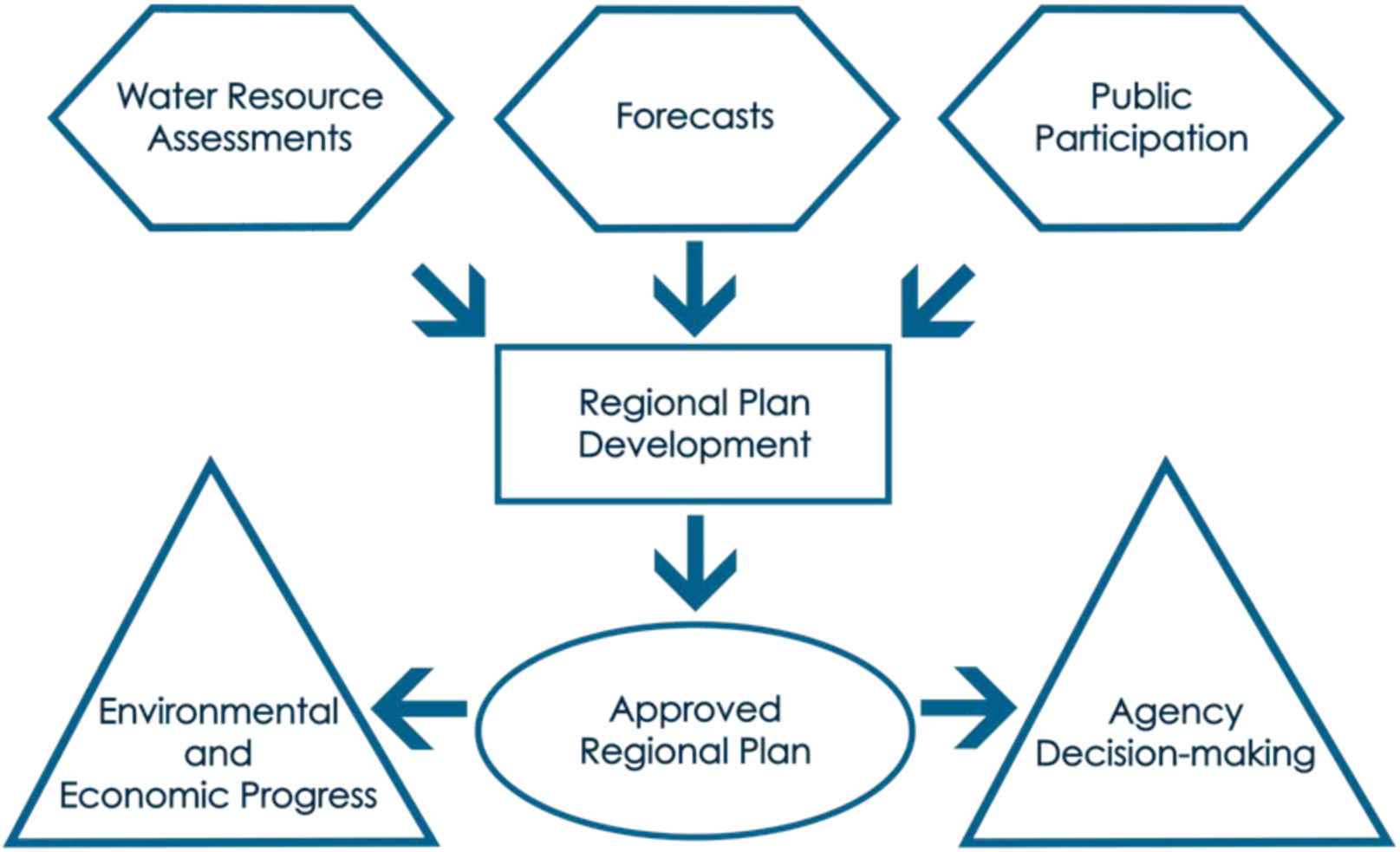
Georgia's
State Water Plan

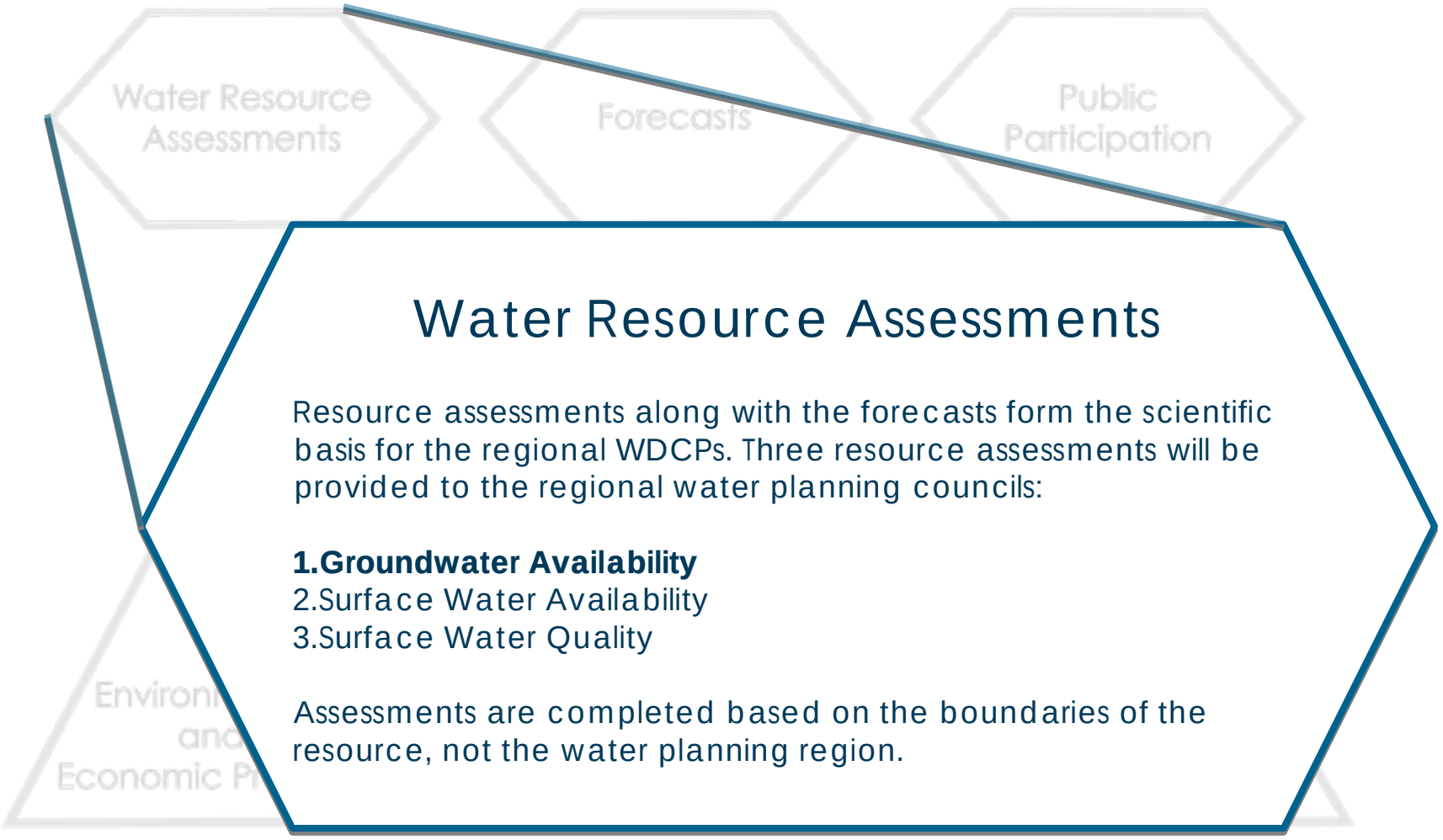
Introduction to Resource Assessments

www.georgiawaterplanning.org

Water Planning Process



Our Focus Today



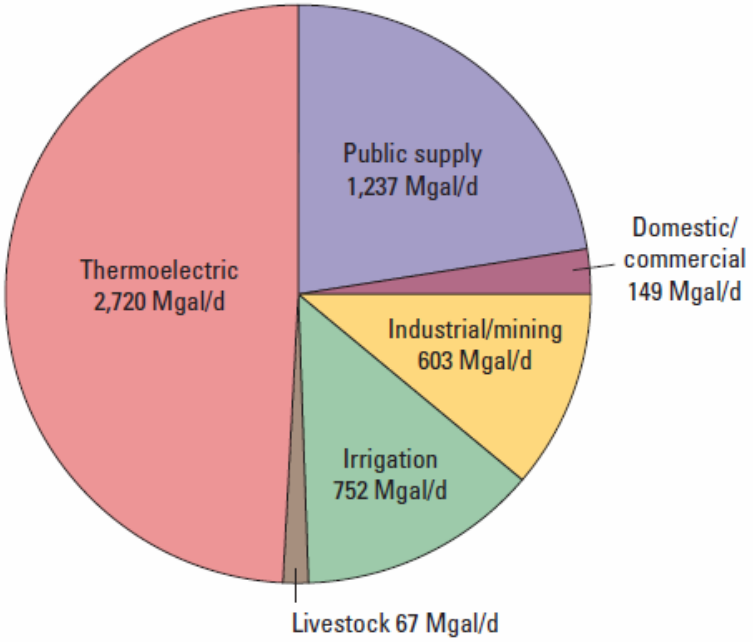
Resource Assessments

Groundwater Availability

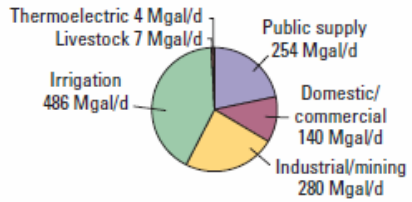
The Georgia Environmental Protection Division (EPD) is preparing an assessment of groundwater availability state-wide.

Groundwater Availability Assessment

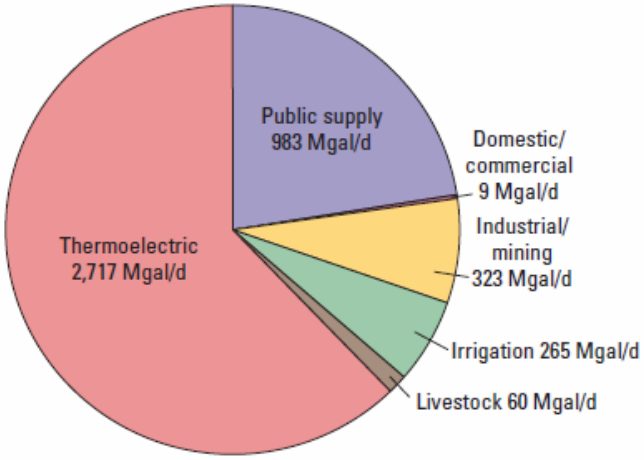
2005 Water Use in Georgia



Total water withdrawals—5,528 Mgal/d



Ground-water withdrawals—1,171 Mgal/d



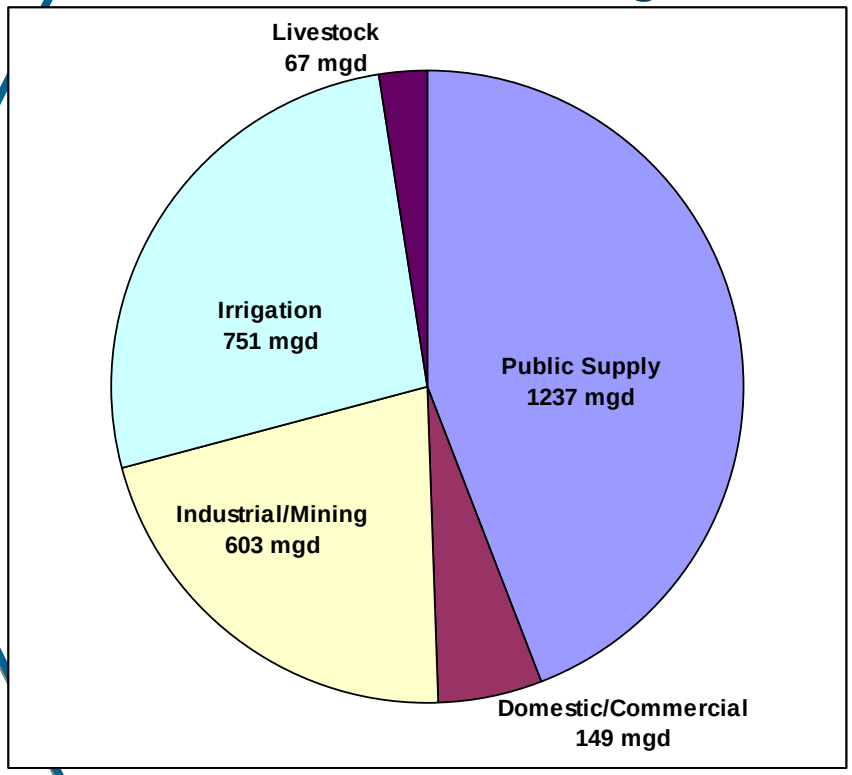
Surface-water withdrawals—4,357 Mgal/d

Data from Fanning, J.L. and V.P Trent, USGS SIR 2009-5002

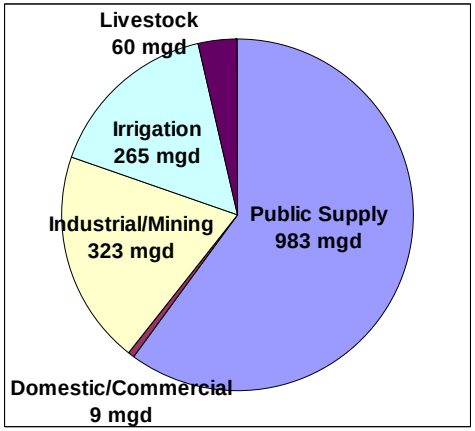
Georgia

Groundwater Availability Assessment

2005 Water Use in Georgia Excluding Thermoelectric Use

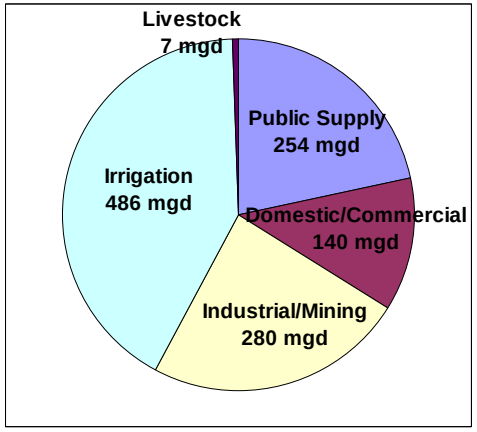


Total Water Withdrawals – 2,807 mgd



Surface Water Withdrawals

1,640 mgd (58.4%)



Groundwater Withdrawals

1,167 mgd (41.6%)

Data from Fanning, J.L. and V.P Trent, USGS SIR 2009-5002

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Groundwater Availability Assessment

Assessment of Groundwater Availability Driven by Section 4 of the Water Management Plan

Manage the consumptive use of water on the basis of defined hydrologic systems of surface water and groundwater

Determine the sustainable yield and consumptive use assessment for each resource based on dry year conditions

A comprehensive accounting of the sustainable yields of all aquifers in Georgia would be extraordinarily expensive and time consuming

Aquifer assessments of sustainable yield are prioritized

Georgia

Groundwater Availability Assessment

Prioritization of Aquifers and Aquifer Units for Assessment of Sustainable Yield

Functional characteristics of the aquifer

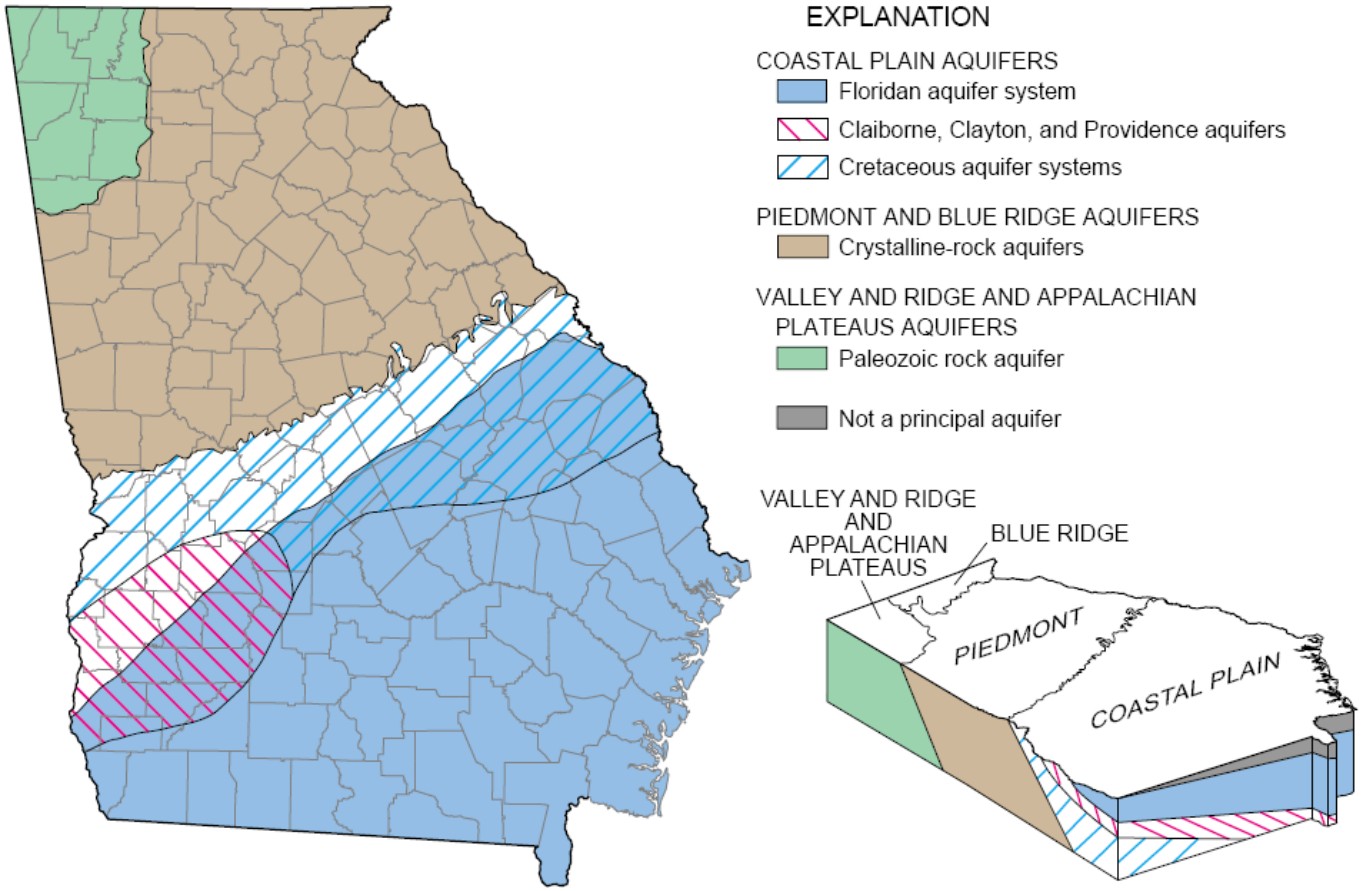
Existing evidence of adverse effects due to withdrawals from the aquifer

Forecasts suggesting significant increases in demands placed on the aquifer

Aquifers where it will not be possible to determine sustainable yield within a reasonable time period

Groundwater Availability Assessment

Georgia's Aquifers

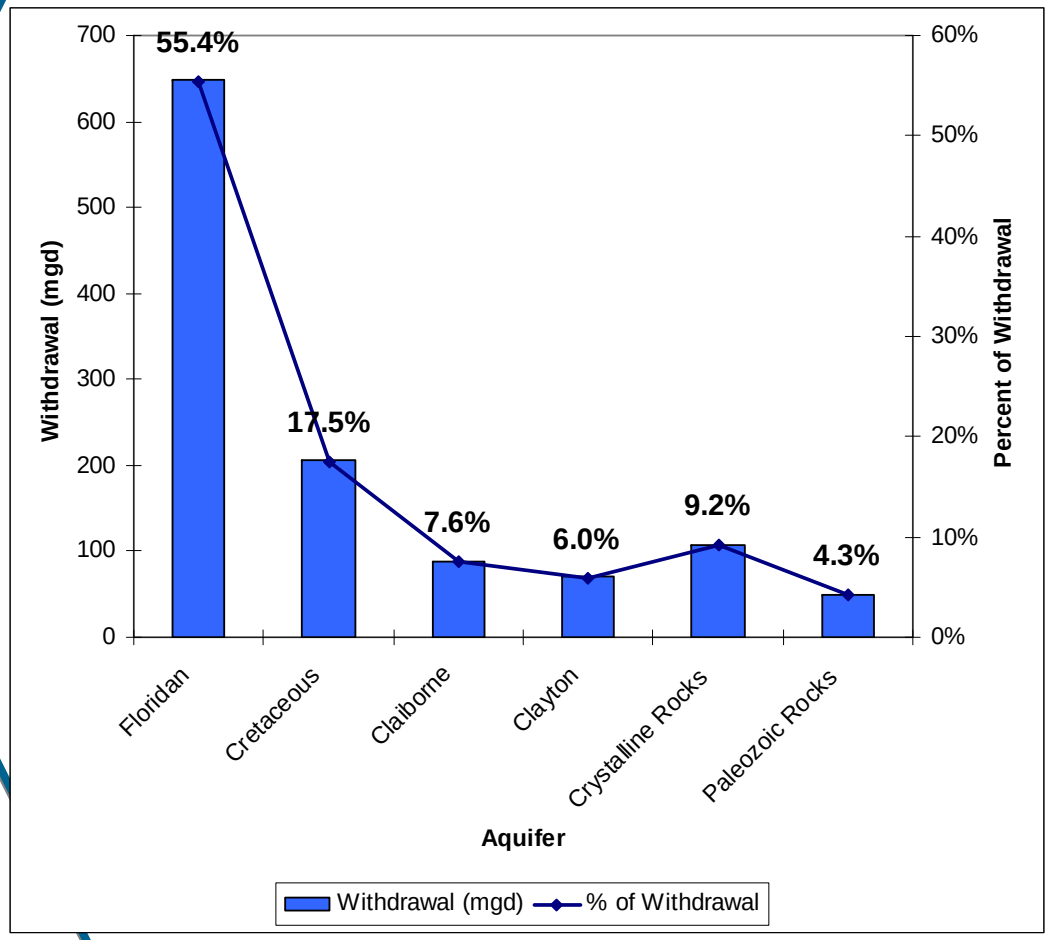


USGS Fact Sheet 010-96

Georgia

Groundwater Resource Assessment

2005 Groundwater Use by Aquifer



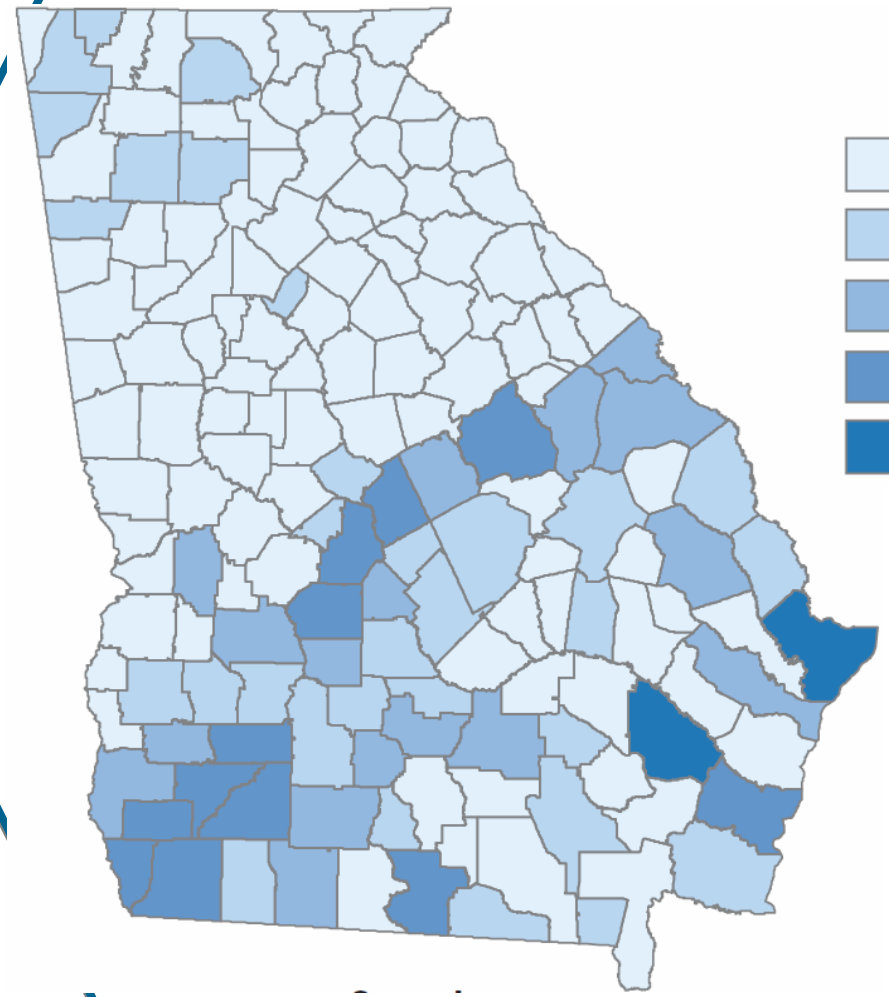
- 86.5% of groundwater was withdrawn from Coastal Plain aquifers in southern Georgia (Floridan, Cretaceous, Claiborne, Clayton)
- 13.5% of groundwater was withdrawn from crystalline rock and Paleozoic rock aquifers in northern Georgia

Data from Fanning, J.L. and V.P Trent, USGS SIR 2009-5002

Georgia

Groundwater Availability Assessment

2005 Groundwater Withdrawals



- Highest amounts of groundwater withdrawals were in the Coastal Plain of southern Georgia
- There were relatively high amounts of groundwater withdrawals in some counties of northern Georgia

Data from Fanning, J.L. and V.P Trent, USGS SIR 2009-5002

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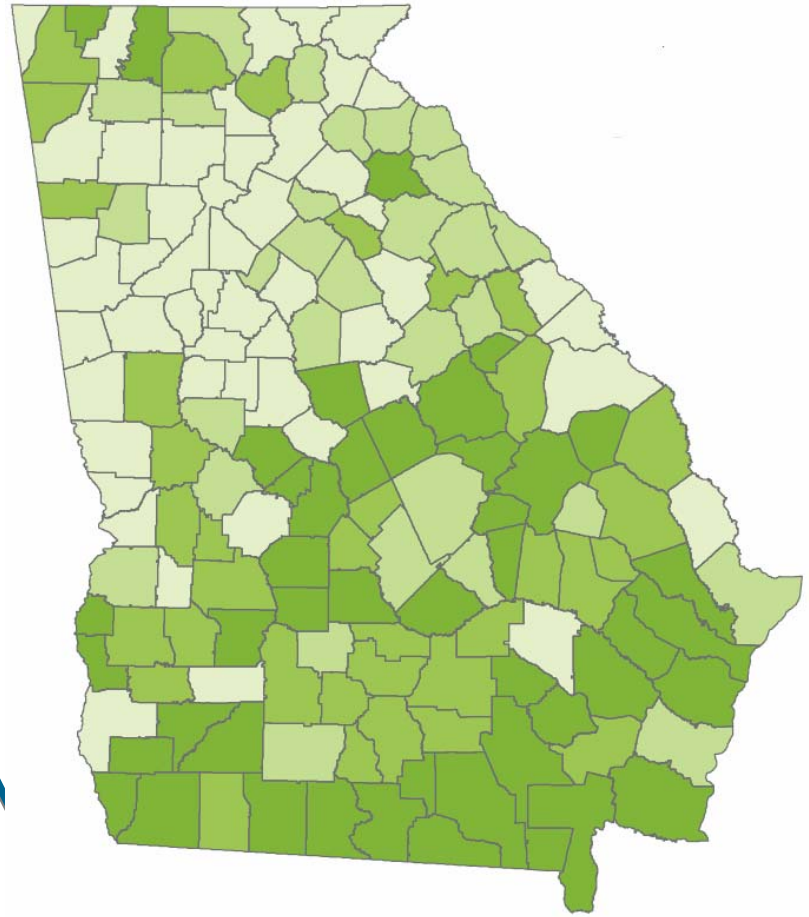
Groundwater Availability Assessment

Percentage of 2005 Water Withdrawals That Were From Groundwater



- Counties with the highest percentages of water from groundwater were in the Coastal Plain of southern Georgia
- Some counties in northern Georgia had high percentages of water from groundwater

Data from Fanning, J.L. and V.P Trent, USGS SIR 2009-5002

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Groundwater Availability Assessment

Determine Sustainable Yield

Determine sustainable yield of aquifers and aquifer units for which current or projected withdrawals could cause unacceptable impacts such as

- Progressive reduction of the groundwater resource as indicated by dropping water levels that do not recover
- Reduction of stream flows
- Salt water intrusion
- Sinkhole development

Sustainable yield will be developed through development of a numerical model or water balance

Georgia

Groundwater Availability Assessment

Prioritization of Aquifers for Determination of Sustainable Yield

Numerical (MODFLOW) computer models of Coastal Plain aquifers where most groundwater is withdrawn, groundwater withdrawals have caused some unacceptable impacts, and forecasts suggest increases in future withdrawals

- Upper Floridan aquifer in Tift County area
- Cretaceous aquifer between Macon and Augusta
- Claiborne aquifer in southwestern Georgia
- Upper Floridan aquifer in eastern Coastal Plain

Water balance models in the north Georgia crystalline and Paleozoic rock aquifers where less groundwater is withdrawn

Georgia

Groundwater Availability Assessment

Aquifer Sustainable Yield may be Limited by Groundwater Quality

No direct wastewater disposal to groundwater in Georgia

Evaluate groundwater quality in a different manner than surface water quality

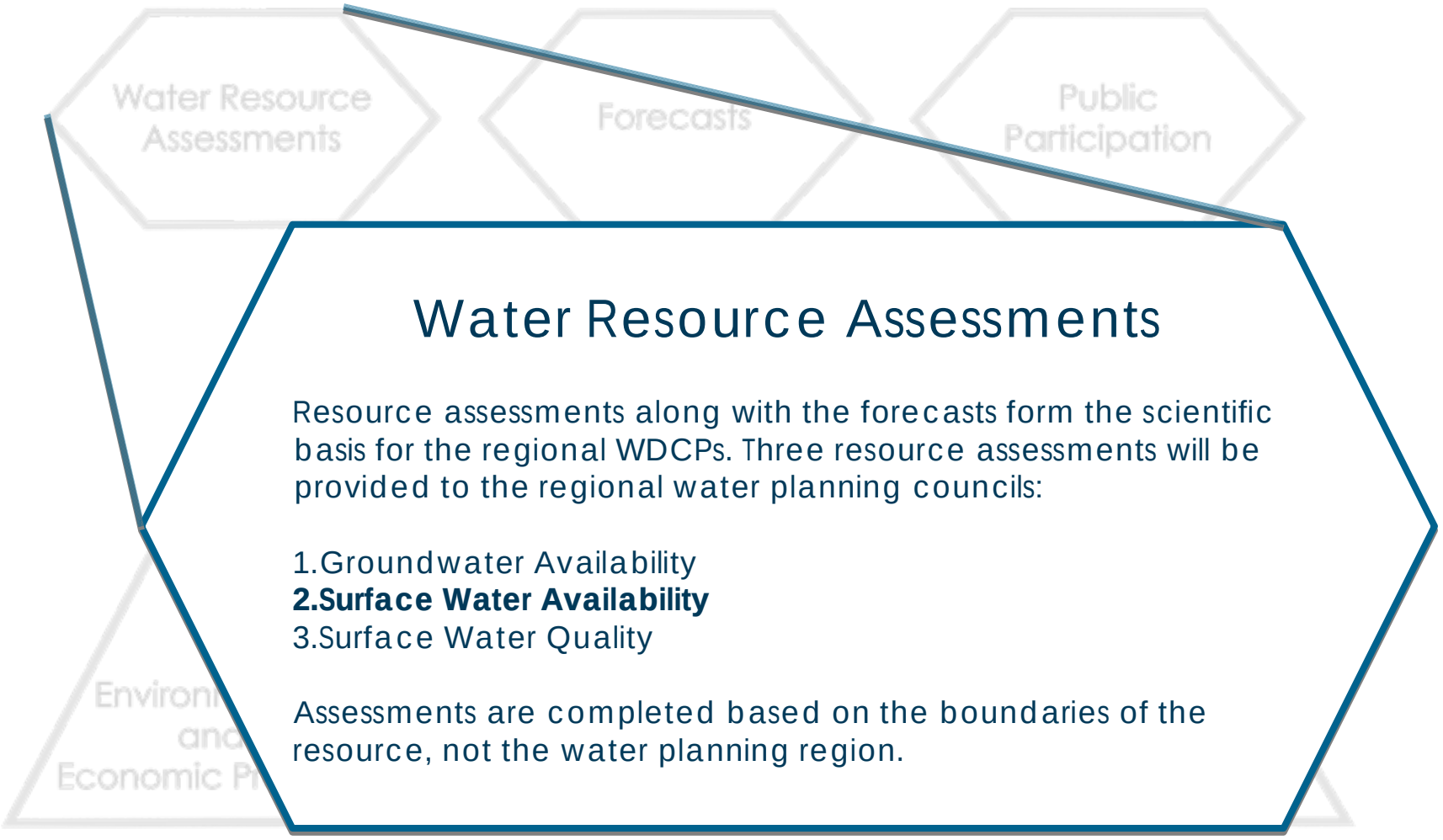
May have to limit groundwater withdrawals to not impair groundwater quality

Limit withdrawals from Atlantic Coastal Plain aquifers to manage salt water intrusion

Limit withdrawals from crystalline and Paleozoic rock aquifers in areas of man-made pollutant plumes (e.g. landfill leachate, dry cleaner plumes, underground storage tank (UST) plumes)

Georgia

Our Focus Today



Resource Assessments

Surface Water Availability

The Georgia Environmental Protection Division (EPD) is preparing an assessment of surface water availability state-wide using a computer model developed by the Georgia Tech Water Resources Institute.

Surface Water Availability Assessment

Overarching Questions

How much water are we using?

How much water do we have?

How much water is naturally available?

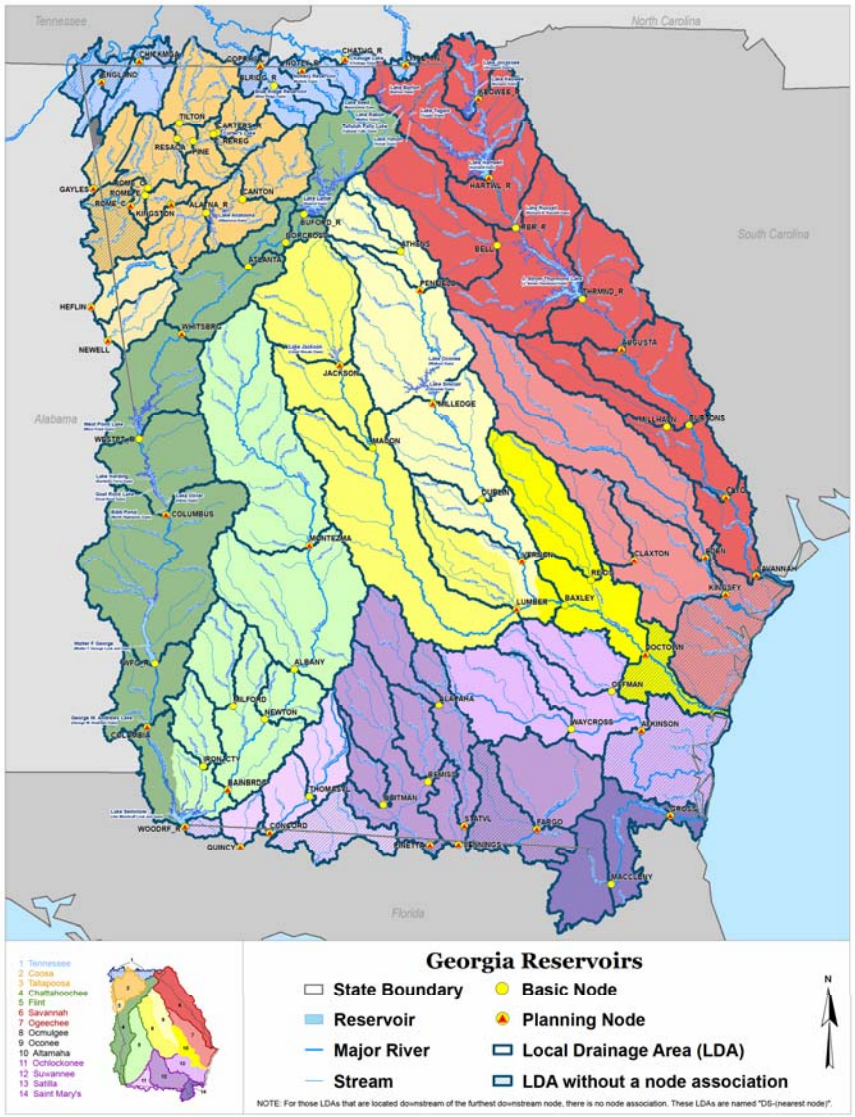
How much water can we reliably use without compromising the in-stream flow needs?

What are the in-stream flow needs?

How much water use can be sustained subject to these needs?

Surface Water Availability Assessment

River Basin Map with Nodes



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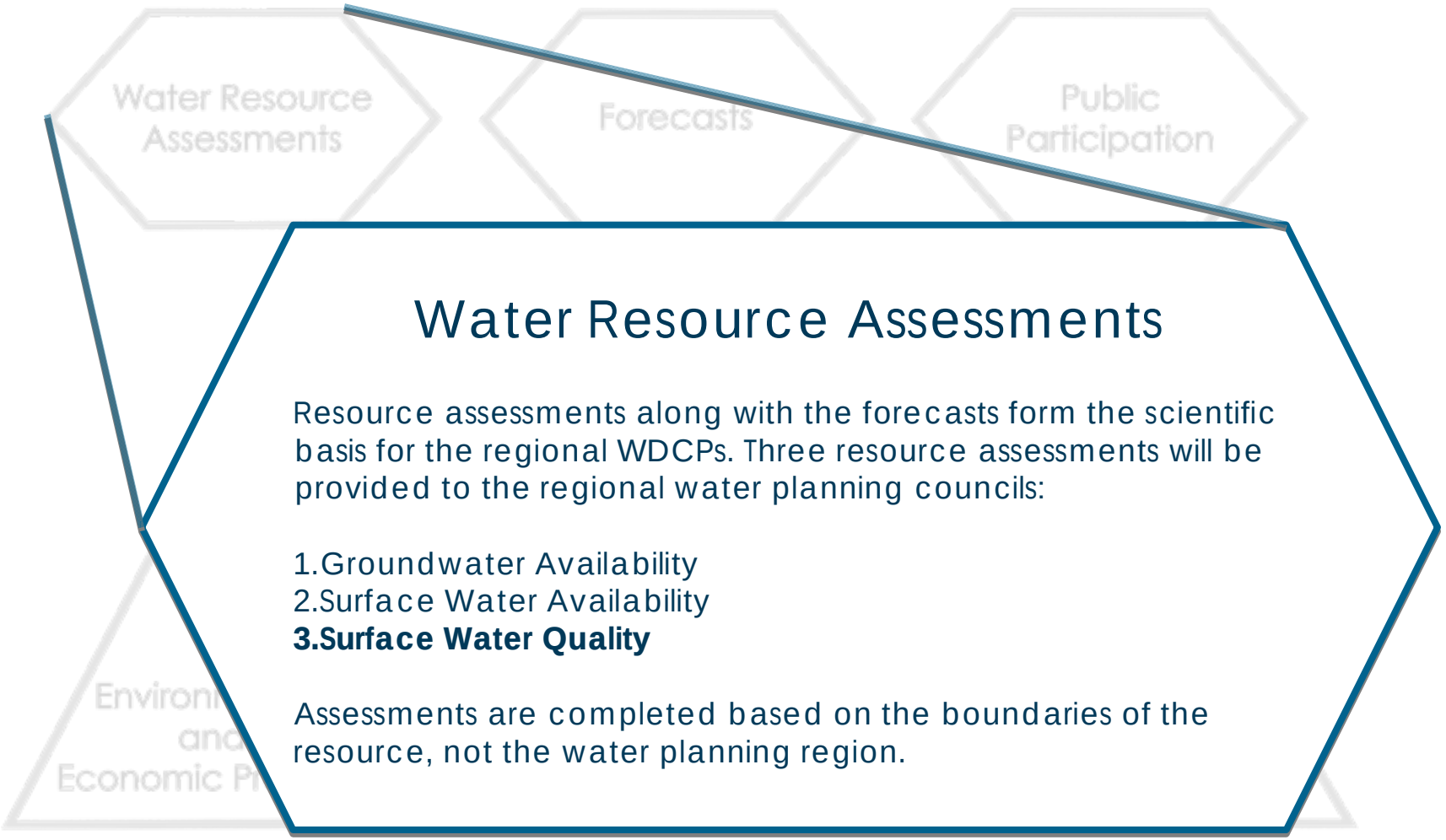
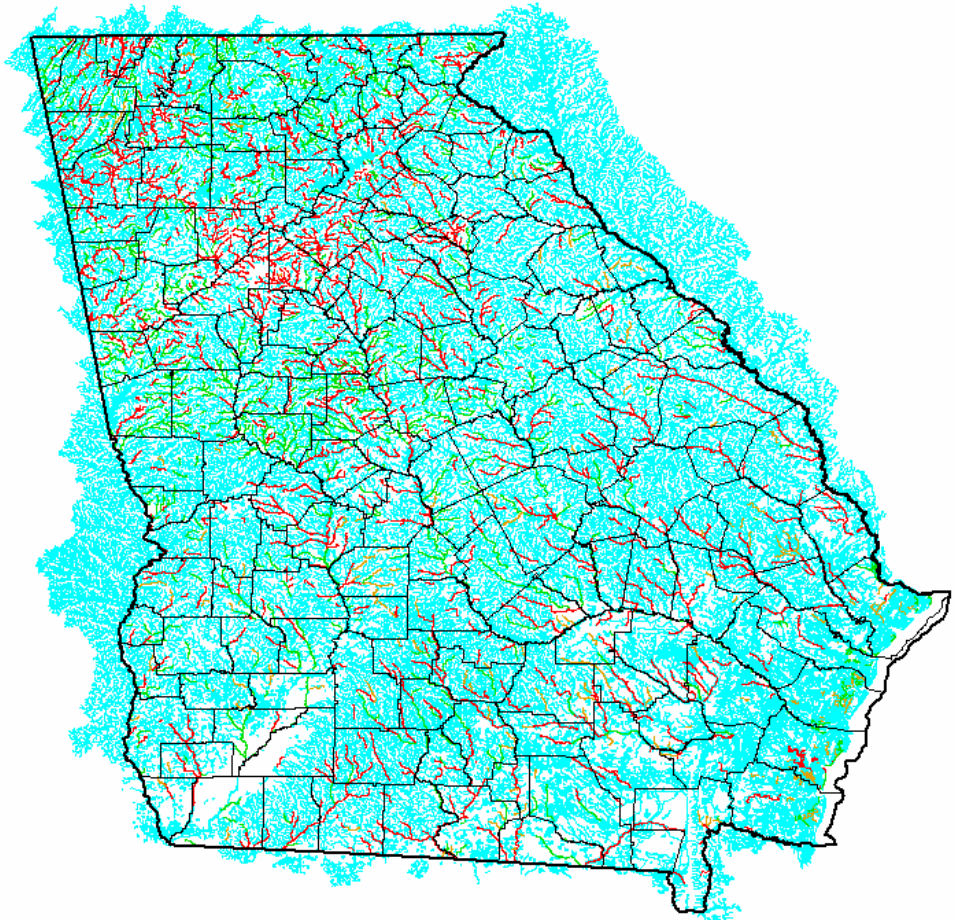


Surface Water Quality Assessment

2008 305(b)/303(d) listed Segments



Surface Water Quality Assessment

Current Assimilative Capacity Assessment

Develop water quality models using available data and conservative assumptions

Calibrate models to existing conditions

Use models to conduct resource assessments to evaluate current wasteload allocations

Identify areas with available assimilative capacity

Identify areas of overallocation or other challenges

Surface Water Quality Assessment

Future Assimilative Capacity Assessment

Use models to assist in planning by evaluating the water quality impacts of forecasted flows, proposed discharge locations, and future land use patterns

Based on model results, Georgia EPD will propose a range of discharge allocation options to the Regional Water Planning Councils

Using an iterative approach, the Regional Water Planning Councils will then evaluate the various options with Georgia EPD

Resource Assessment

Additional Information in Future Council Meetings

Presentations by EPD Resource Assessment Experts

- Inputs
- Key Assumptions
- Outputs
- Linkages to the planning process
- Sensitivity analysis
- Limitations of resource assessment models
- Future Joint Meetings