State Water Plan Surface Water Availability Resource Assessment

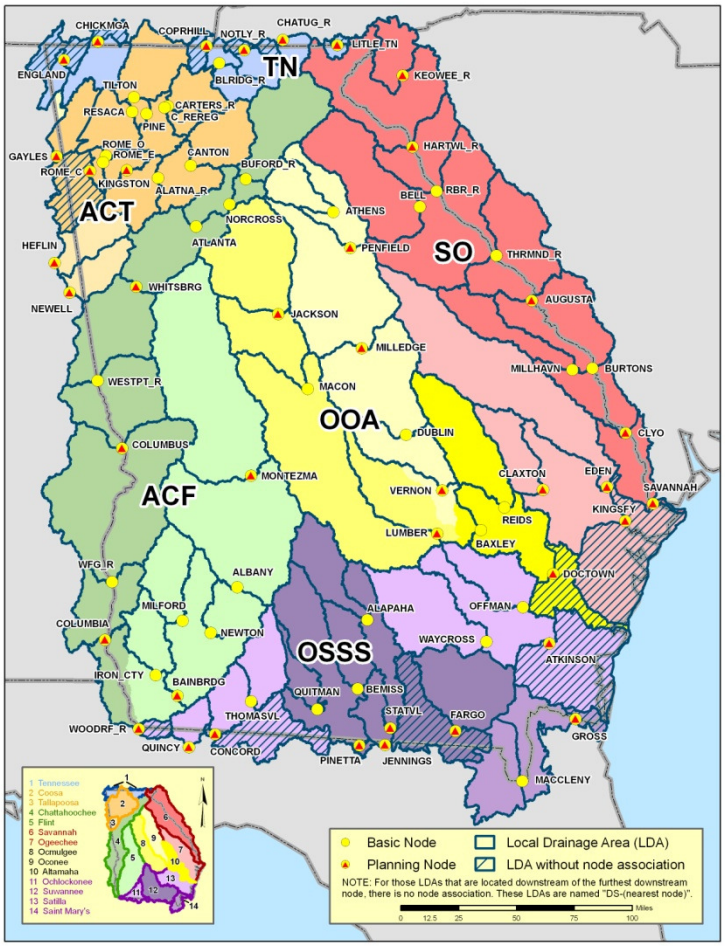
January 2010

Agenda:

- Resource Assessment Objectives
- Modeling Approach
- Draft Results

Study Basins and Study Nodes

- Six study basins:
  - ACF: Apalachicola-Chattahoochee Flint
  - ACT: Alabama-Coosa-Tallapoosa
  - OOA: Oconee-Ocmulgee-Altamaha
  - OSSS: Ochlocknee-Suwannee-Satilla-St. Marys
  - SO: Savannah-Ogeechee
  - TN: Tennessee
- Study nodes:
  - 70+ basic nodes
  - 40+ planning nodes



Resource Assessment Objectives

- Assess current availability of surface water resource for both:
  - Consumptive water use (off-stream use), and
  - Flow regime (in-stream use)
- Identify and quantify gaps between currently available resource and combined current needs

Modeling Approach Advantages

- Uses available existing data
- Built upon earlier studies by the Corps of Engineers and the States of Georgia, Alabama, Florida, and South Carolina
- Allows us to evaluate current and future water use scenarios and management practices
- Strong foundation for further detailed regional analyses, if needed

Modeling Approach Limitations

- Regional planning level resolution
  - Results at 70+ basic nodes and 40+ planning nodes
- Models used for broad scale regional planning, not for individual permitting decisions

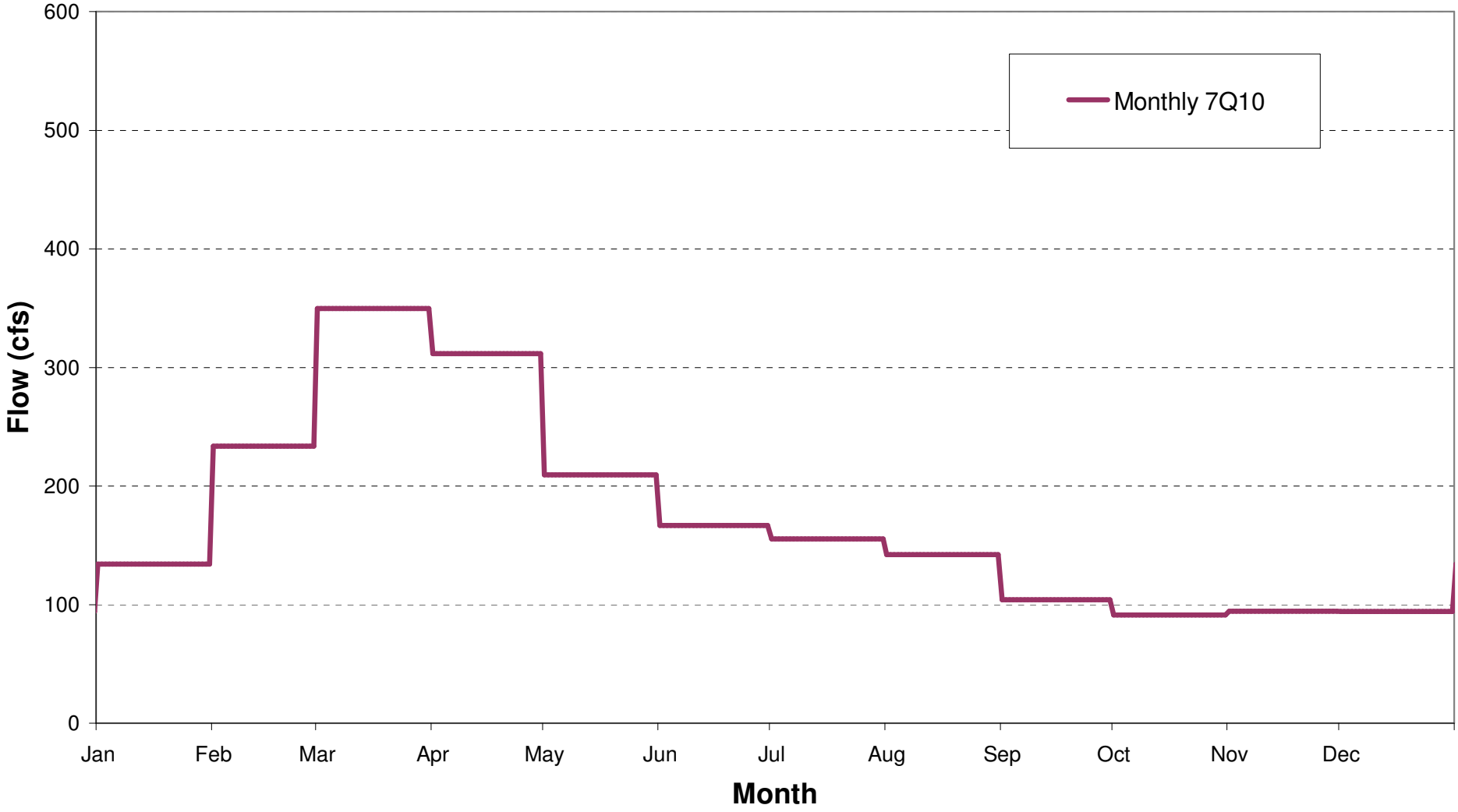
Current Conditions Assessment Modeling Approach

- **River Basin Planning Tool and Reservoir Operation Models**
- **Inputs:**
  - Unimpaired or “natural” flow data representing natural hydrologic conditions over a period of nearly 70 years
  - Water use data representing current, instead of permitted level of withdrawals, discharges, and consumptive water use
  - Flow regime:
    - US Army Corps of Engineers’ Water Control Plan
    - State Interim Instream Flow Protection Policy: protecting monthly 7Q10 or natural inflow, whichever is lower

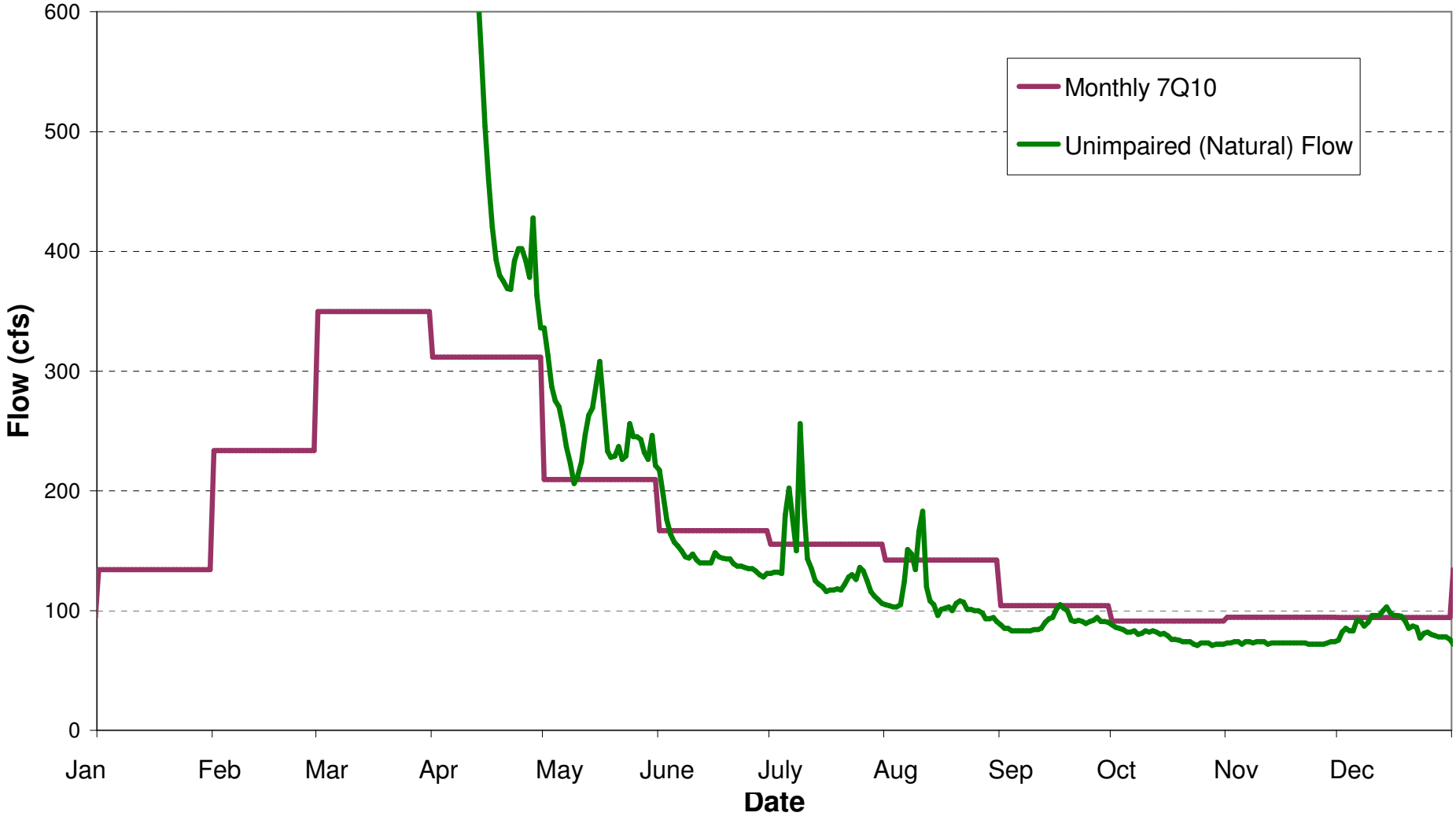
General Approach in Identifying Resource Gaps

- Step 1 – Determine monthly 7Q10 for each of the unregulated Planning Nodes
- Step 2 – Determine unimpaired or “natural” flow for a node by removing man-made effects on flow observed at that node for the 70 year period
- Step 3 – Develop Flow Regime by taking the less of the two
- Step 4 – Identify gaps between availability and demand by comparing the Flow Regime to modeled stream flow assuming all water demands are being met

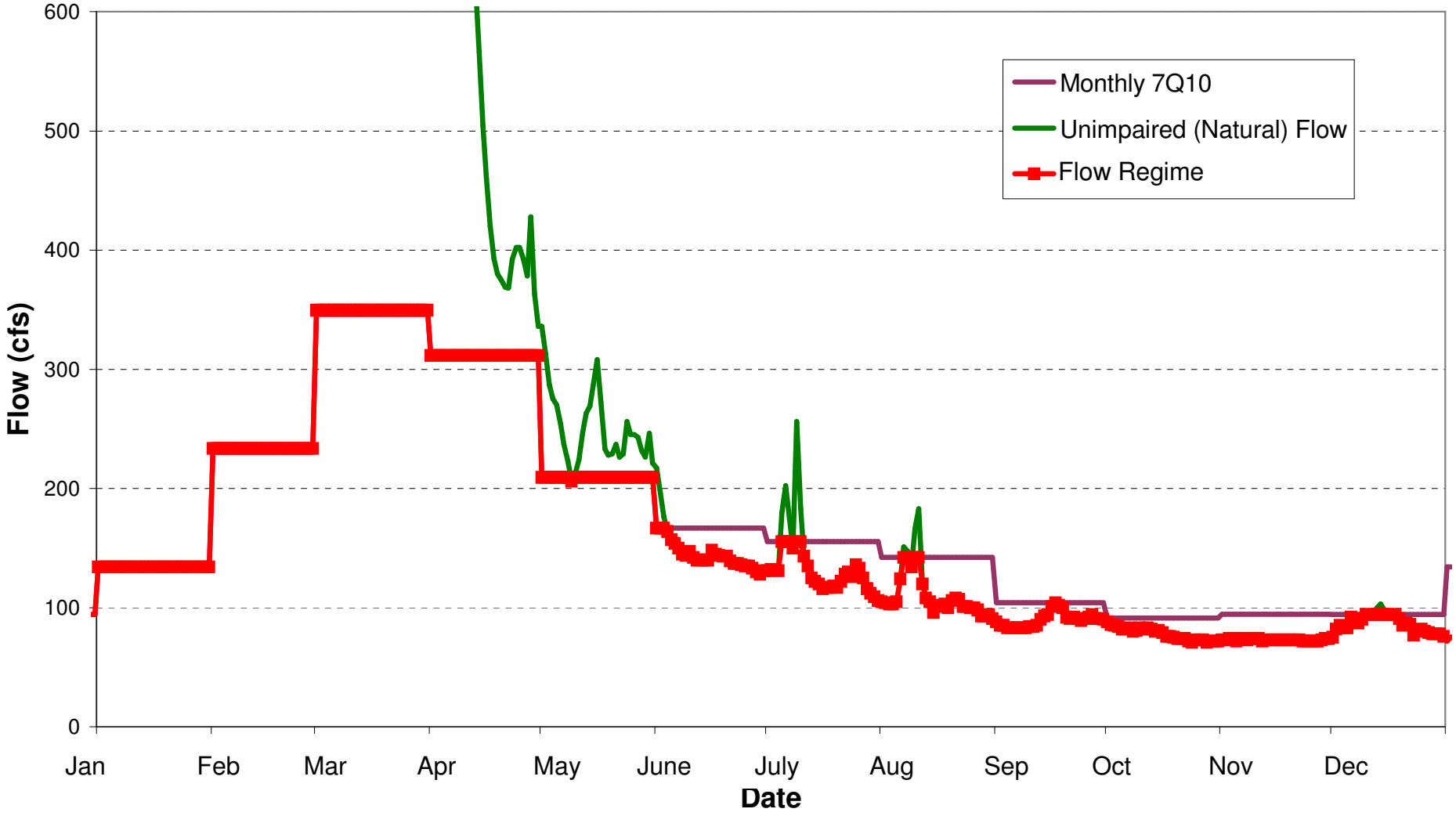
Step 1 – Determine Monthly 7Q10



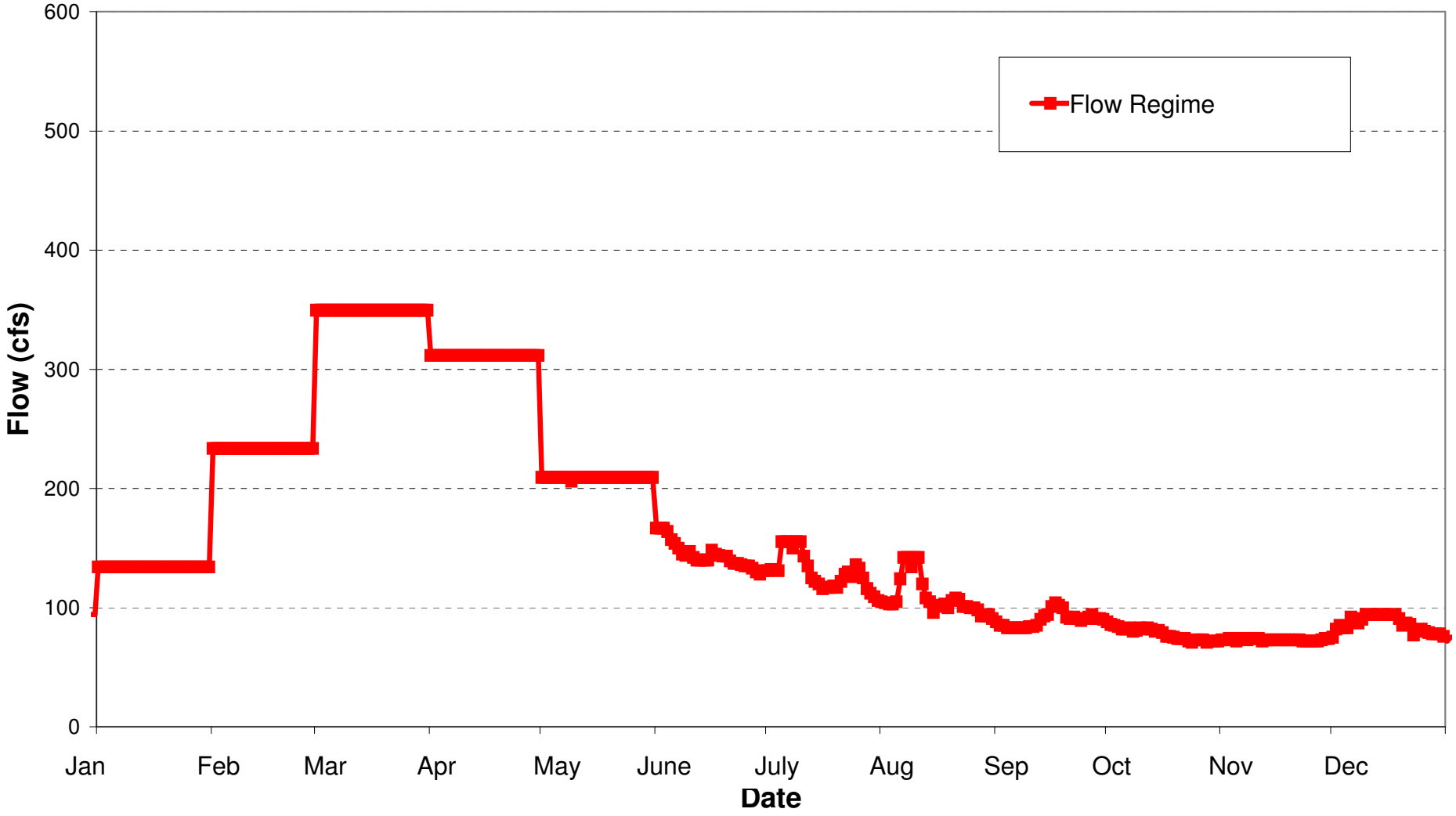
Step 2 – Determine Unimpaired Flow



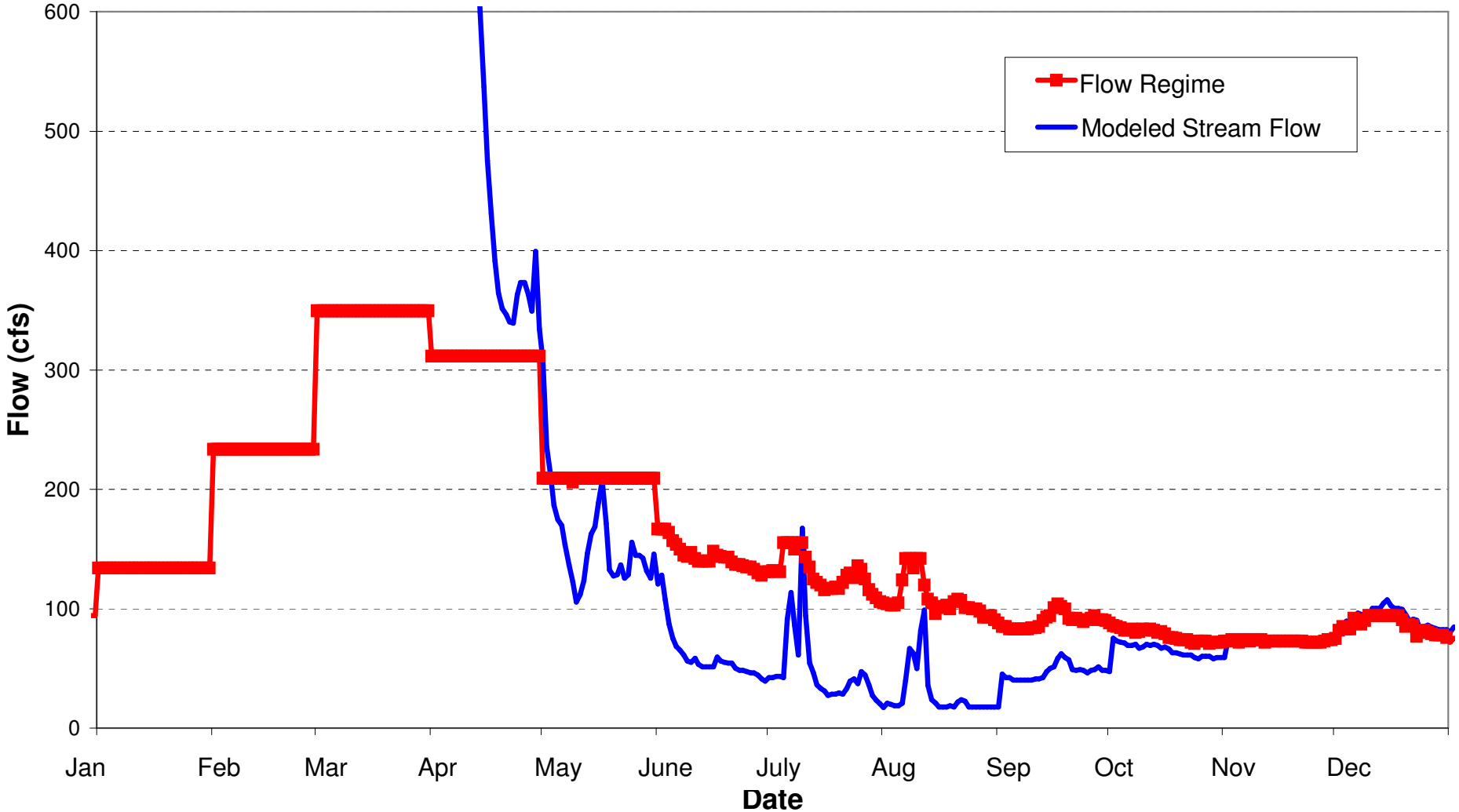
Step 3 – Take Monthly 7Q10 or Natural Flow, Whichever is Lower…



Step 3 – …to Develop Flow Regime

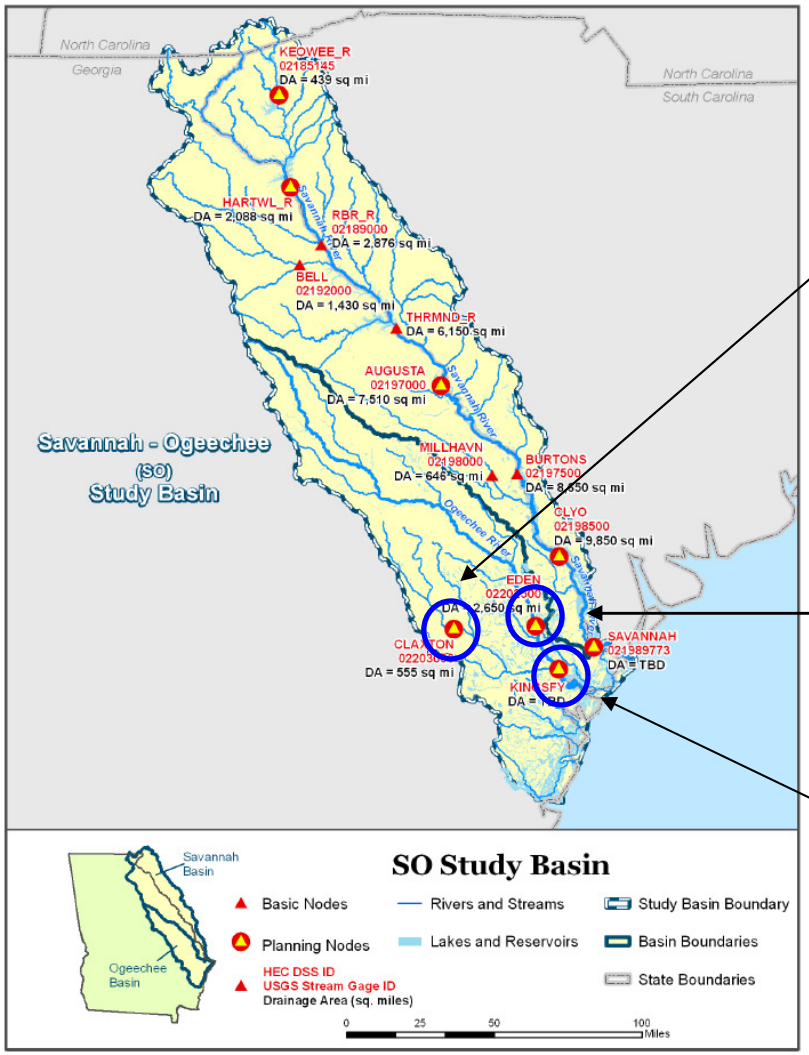


Step 4 – Identify Gaps by Comparing Modeled Stream Flow to Flow Regime



Modeled Stream Flow Assumes Water Demand Fully Met

Ogeechee River Basin

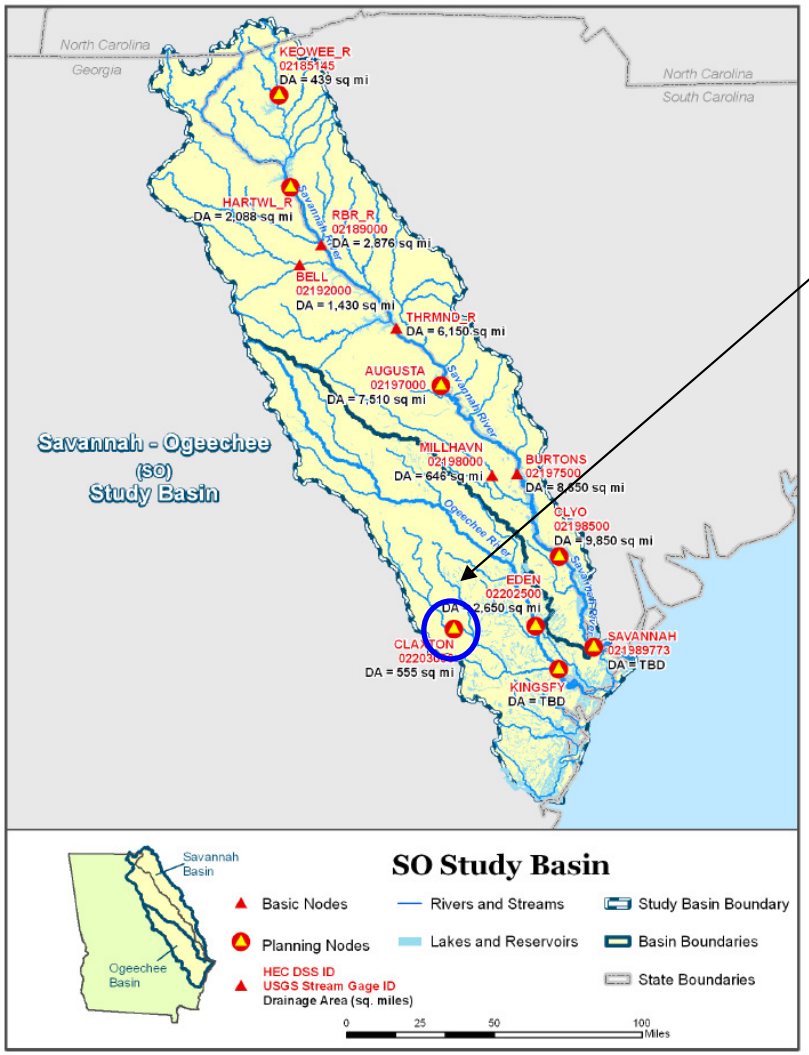


Claxton

Eden

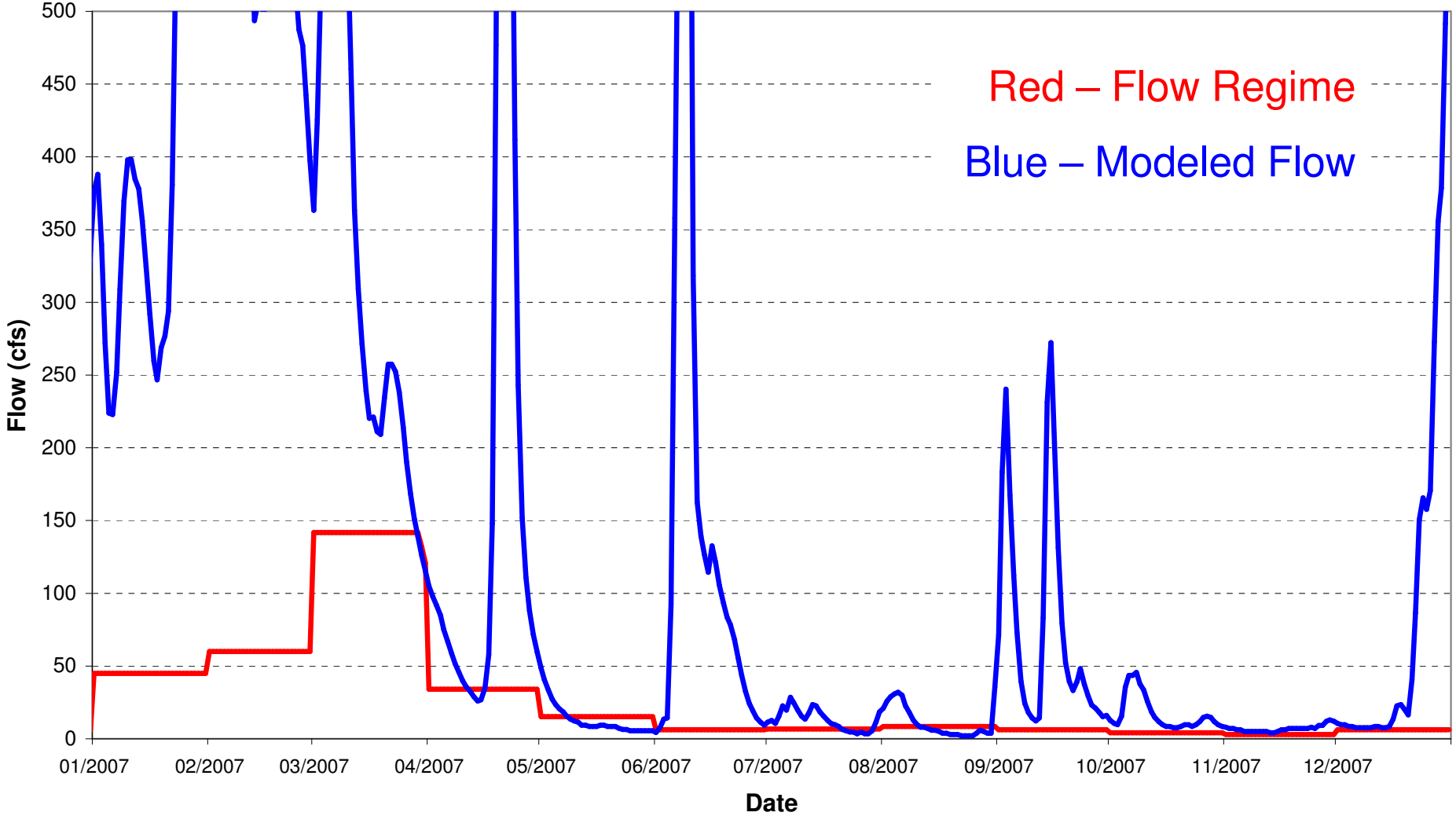
Kings Ferry

Claxton in the Ogeechee River Basin



Claxton

Gap at Claxton in the Ogeechee River

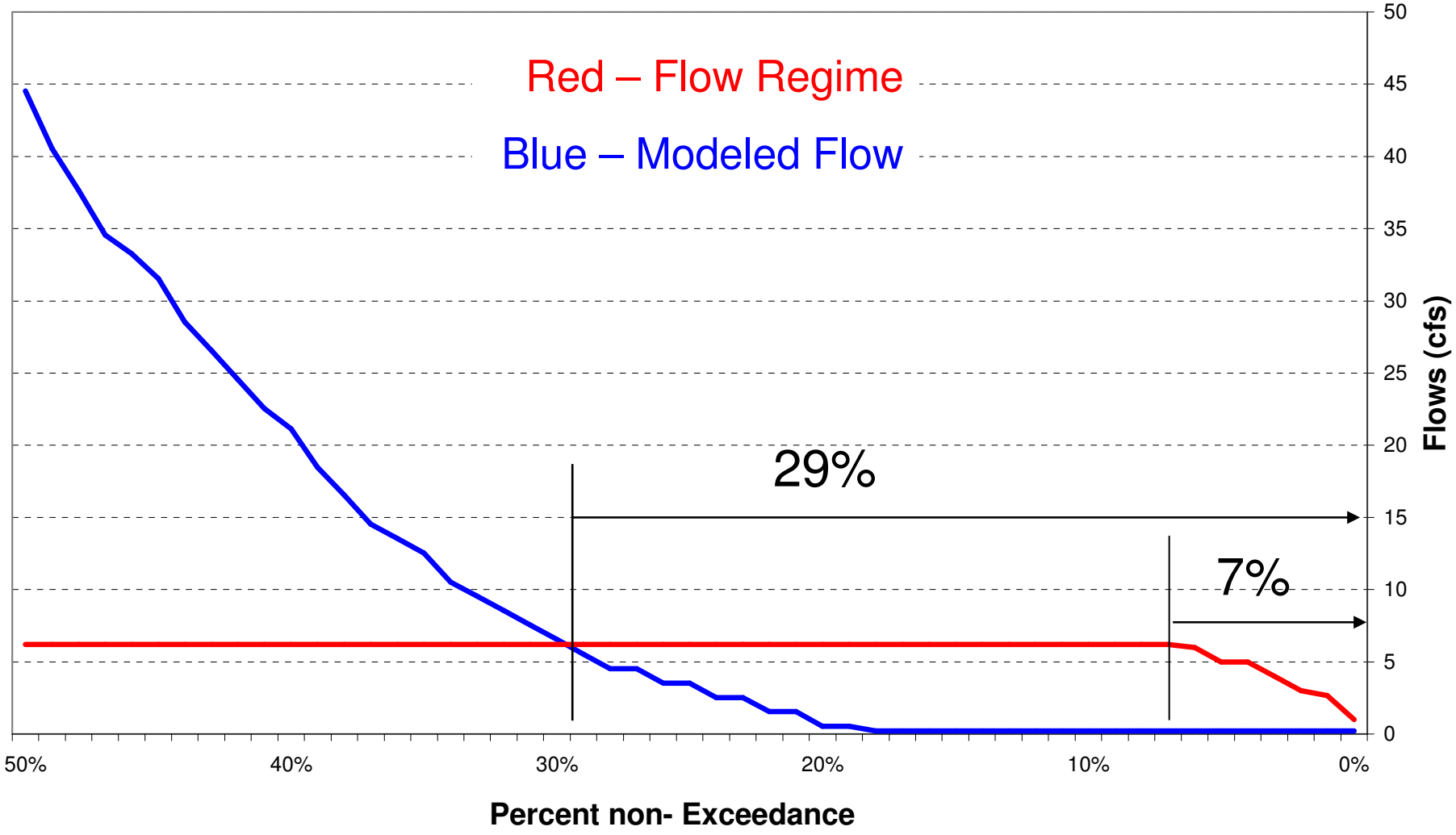


Modeled Stream Flow Assumes Water Demand Fully Met

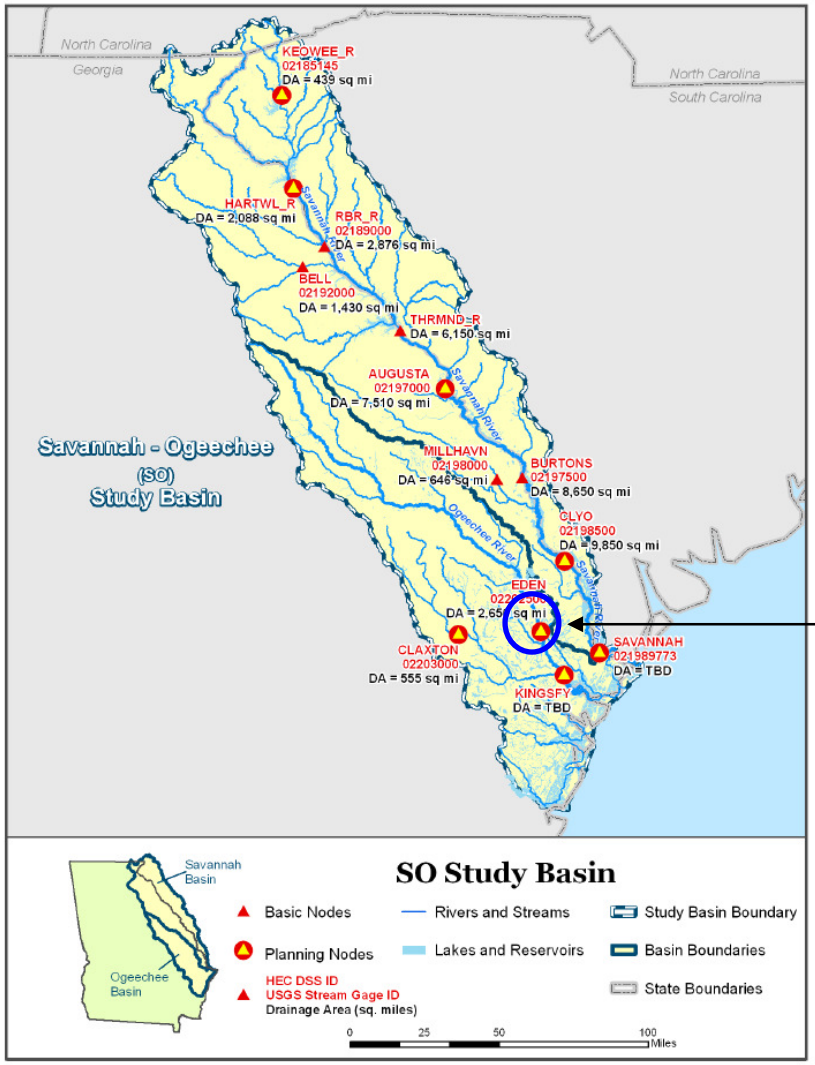
Flow Regime Shortfall at Claxton in Ogeechee River Basin

Length of Shortfall (% of time)	Average Shortfall (cfs)	Long-term Average Flow (cfs)	Maximum Shortfall (cfs)	Corresponding Flow Regime (cfs)
18%	5 (3.2 MGD)	457 (295 MGD)	15 (9.7 MGD)	15 (9.7 MGD)

June Flow Exceedance Curves at Claxton in the Ogeechee River



Eden in the Ogeechee River Basin



Eden

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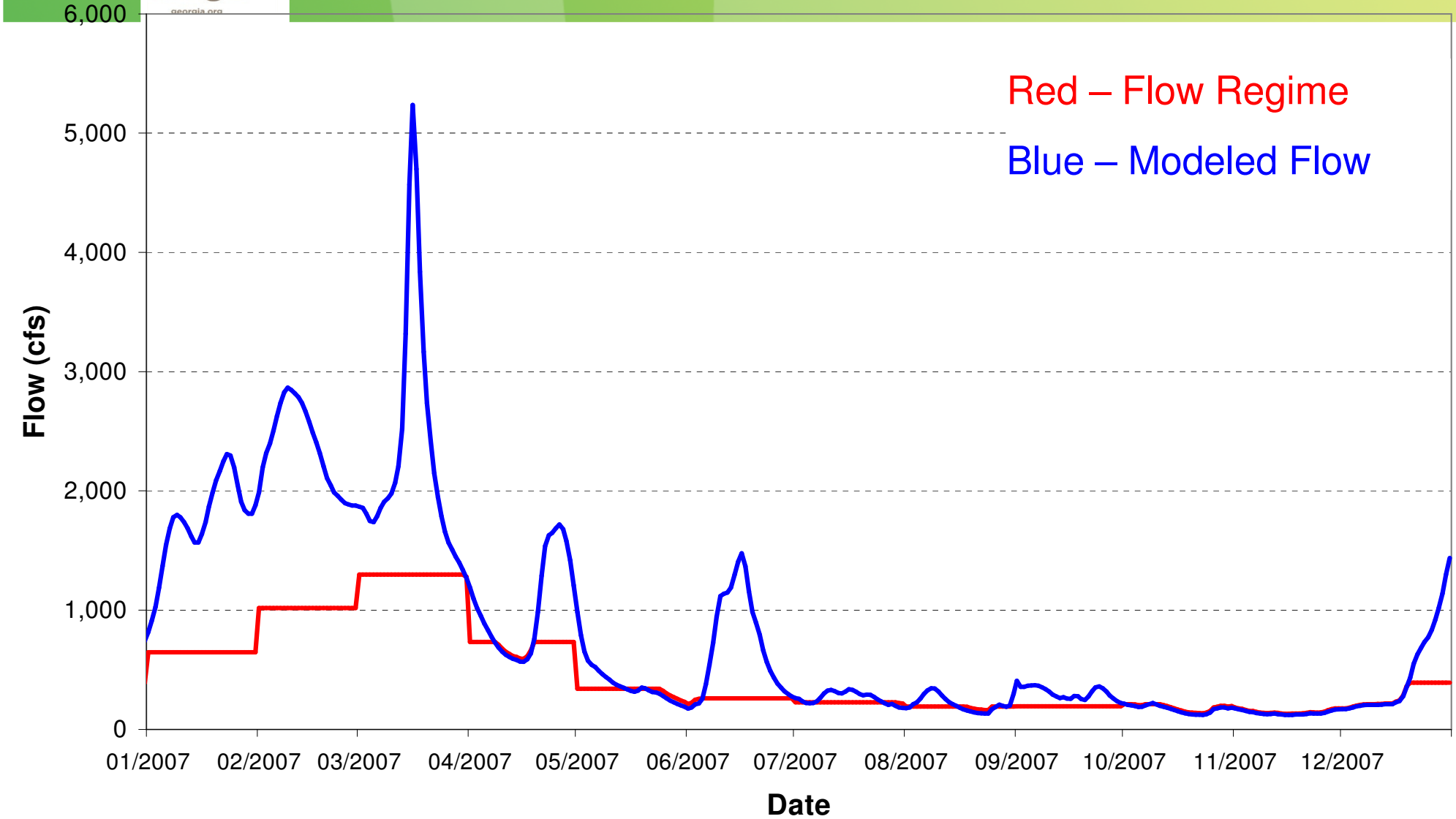
Gap at Eden in the Ogeechee River

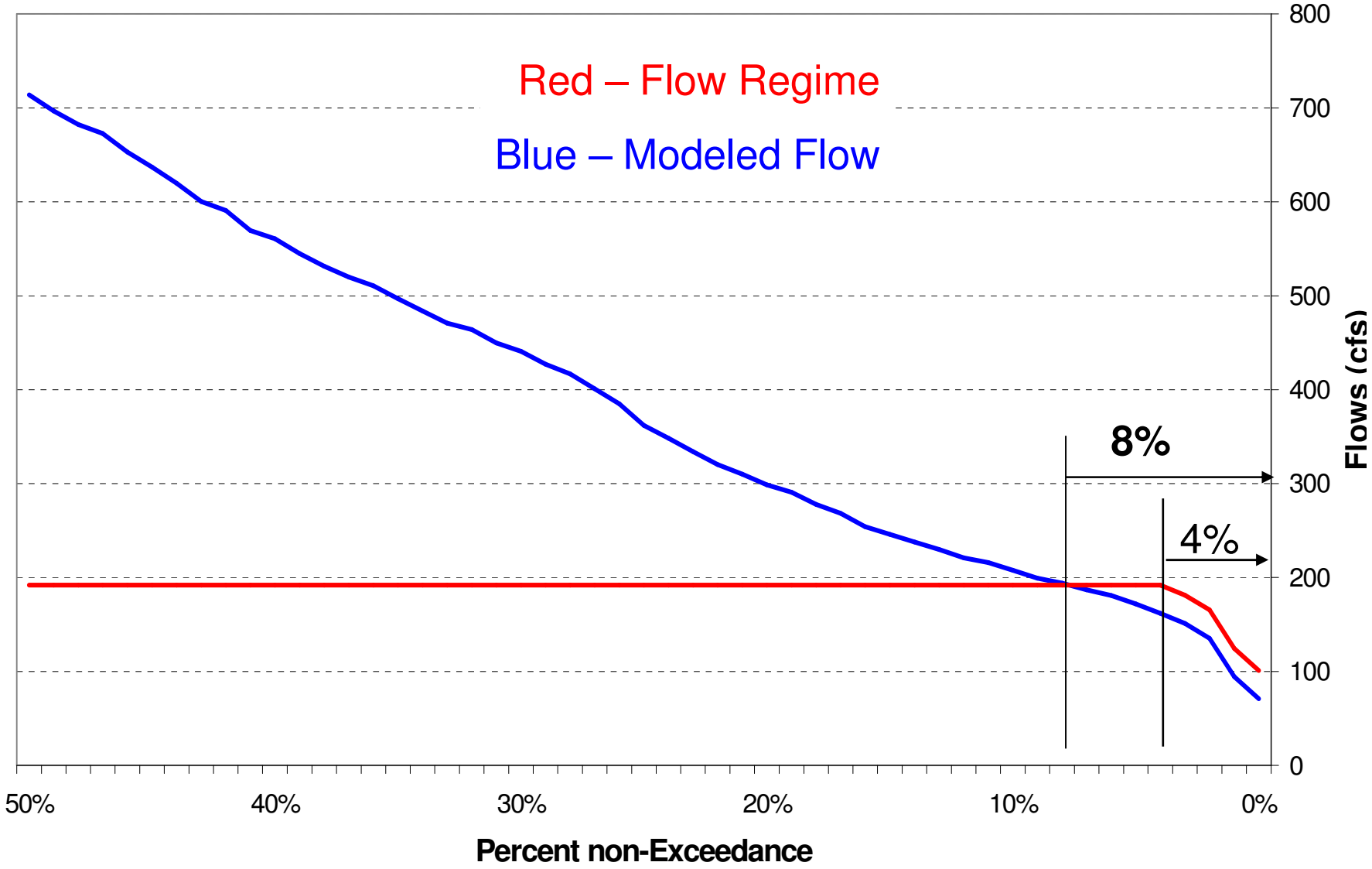


Modeled Stream Flow Assumes Water Demand Fully Met

Flow Regime Shortfall at Eden in Ogeechee River Basin

Length of Shortfall (% of time)	Average Shortfall (cfs)	Long-term Average Flow (cfs)	Maximum Shortfall (cfs)	Corresponding Flow Regime (cfs)
6%	20 (12.9 MGD)	2,257 (1,459 MGD)	42 (27.1 MGD)	201 (130 MGD)

August Flow Exceedance Curves at Eden in the Ogeechee River



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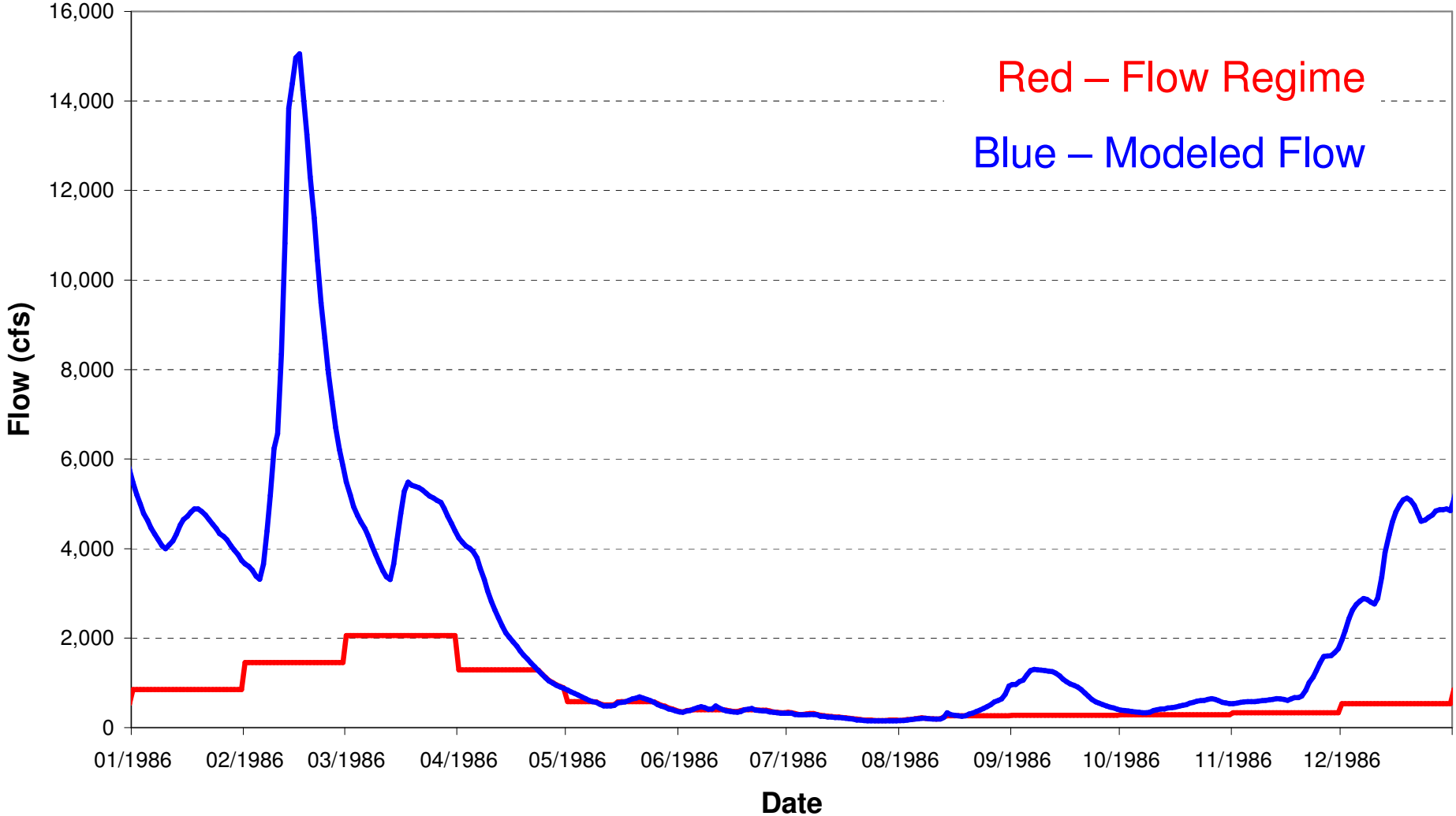
Kings Ferry in the Ogeechee River Basin

Kings Ferry

Gap at Kings Ferry in the Ogeechee River

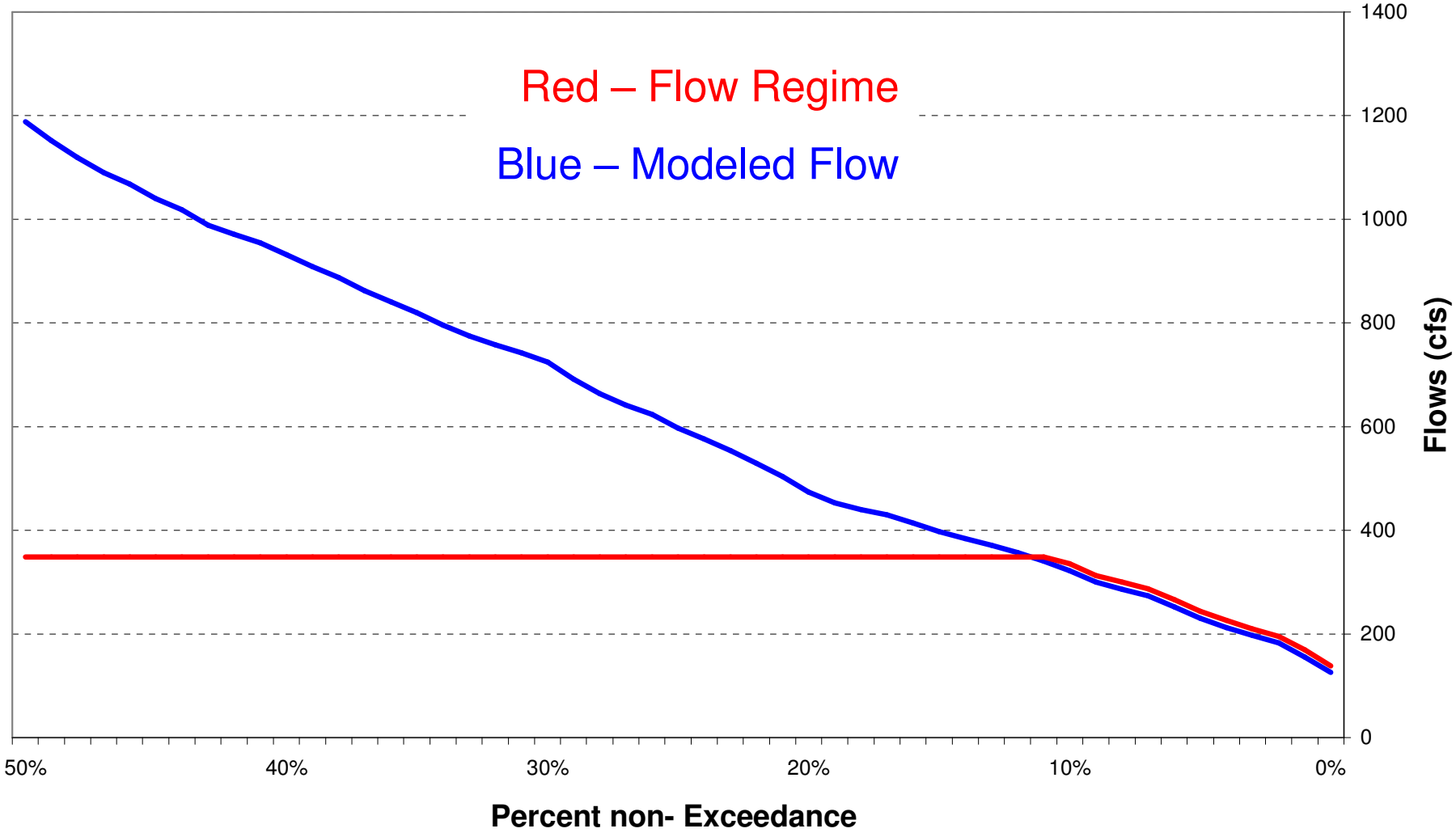


Modeled Stream Flow Assumes Water Demand Fully Met

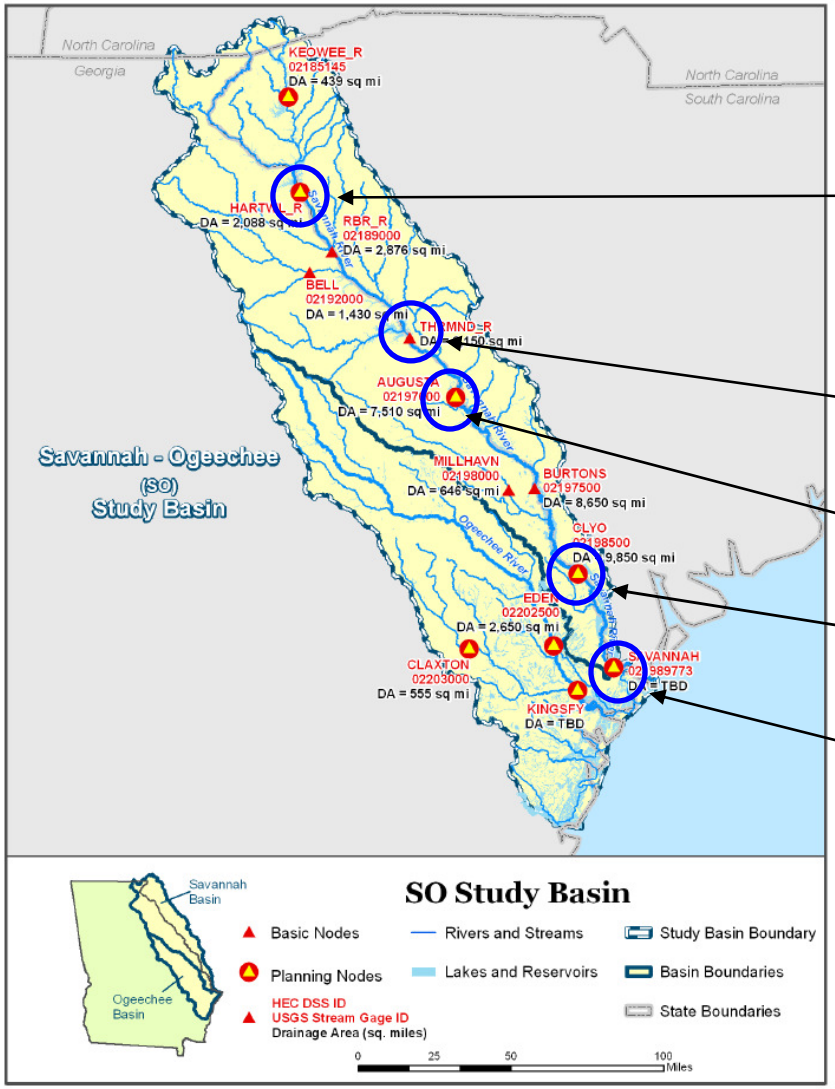
Flow Regime Shortfall at Kings Ferry in Ogeechee River Basin

Length of Shortfall (% of time)	Average Shortfall (cfs)	Long-term Average Flow (cfs)	Maximum Shortfall (cfs)	Corresponding Flow Regime (cfs)
4%	11 (7.1 MGD)	3,720 (2,404 MGD)	17 (11 MGD)	257 (166 MGD)

July Flow Exceedance Curves at Kings Ferry in the Ogeechee River



Savannah River Basin



Hartwell

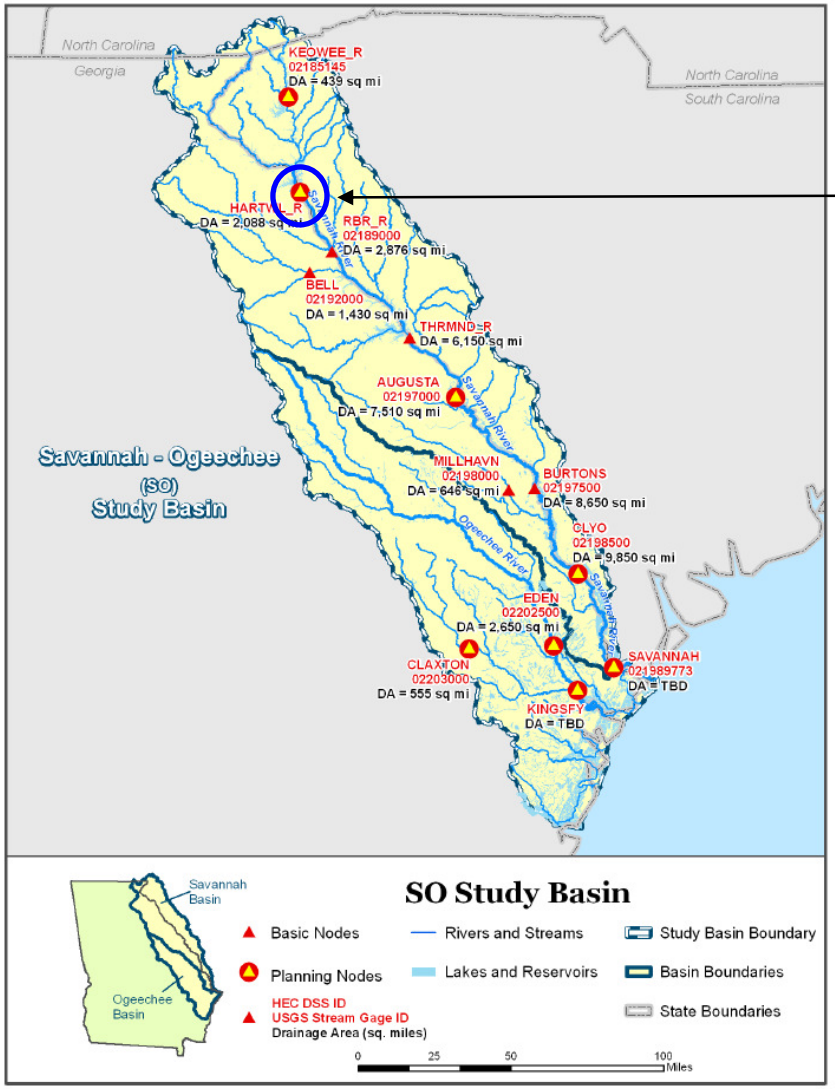
Thurmond

Augusta

Clyo

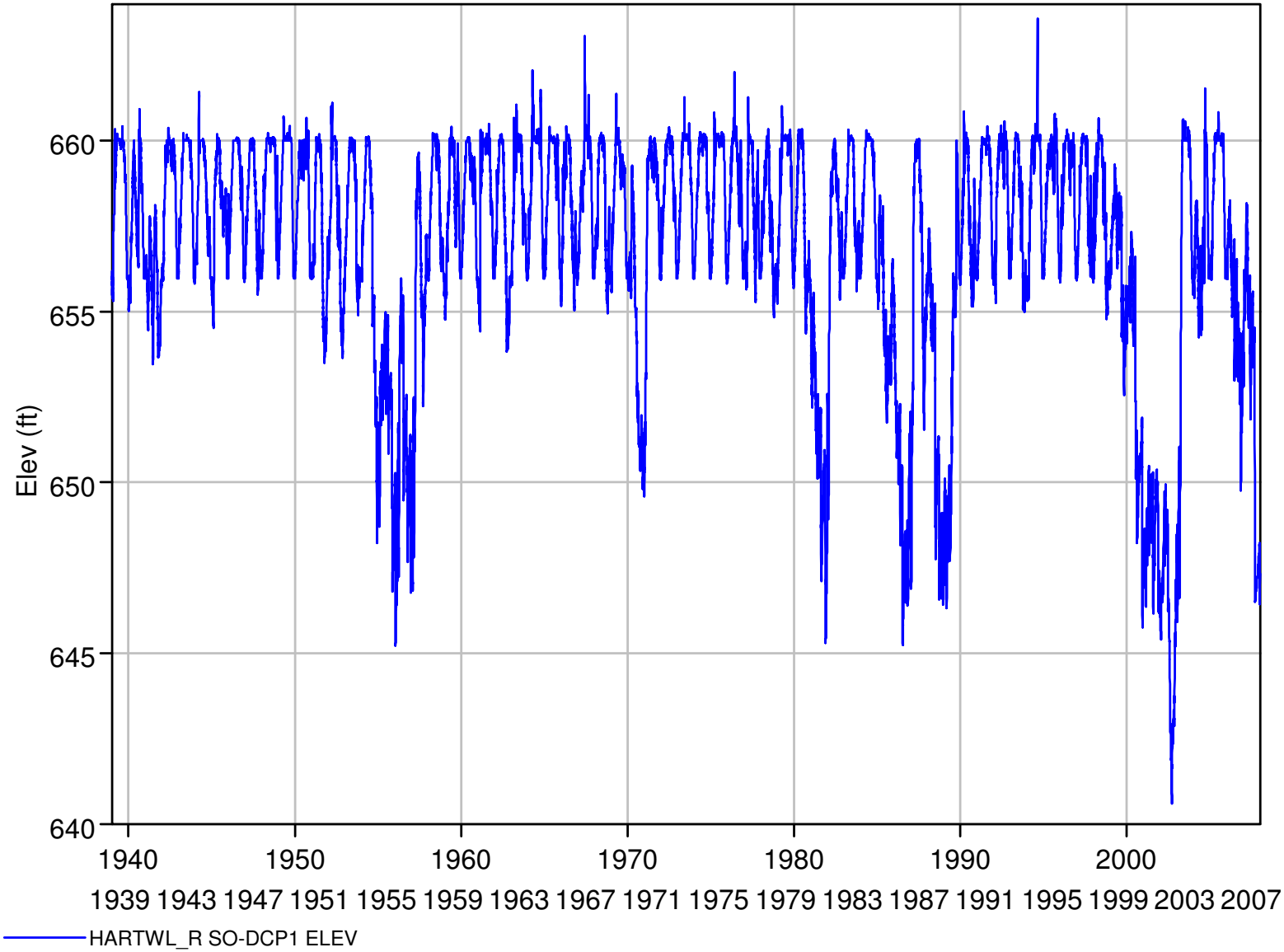
Savannah

Hartwell



Hartwell

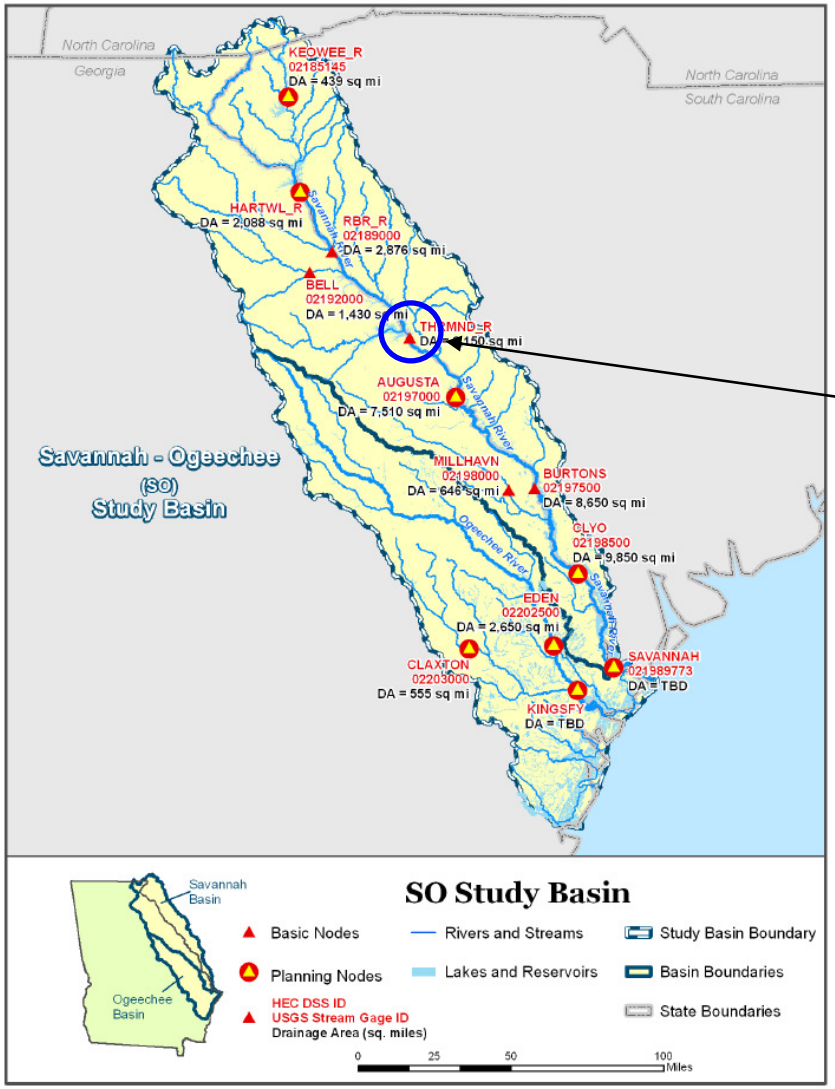
Hartwell Reservoir Elevation



Gap at Hartwell?

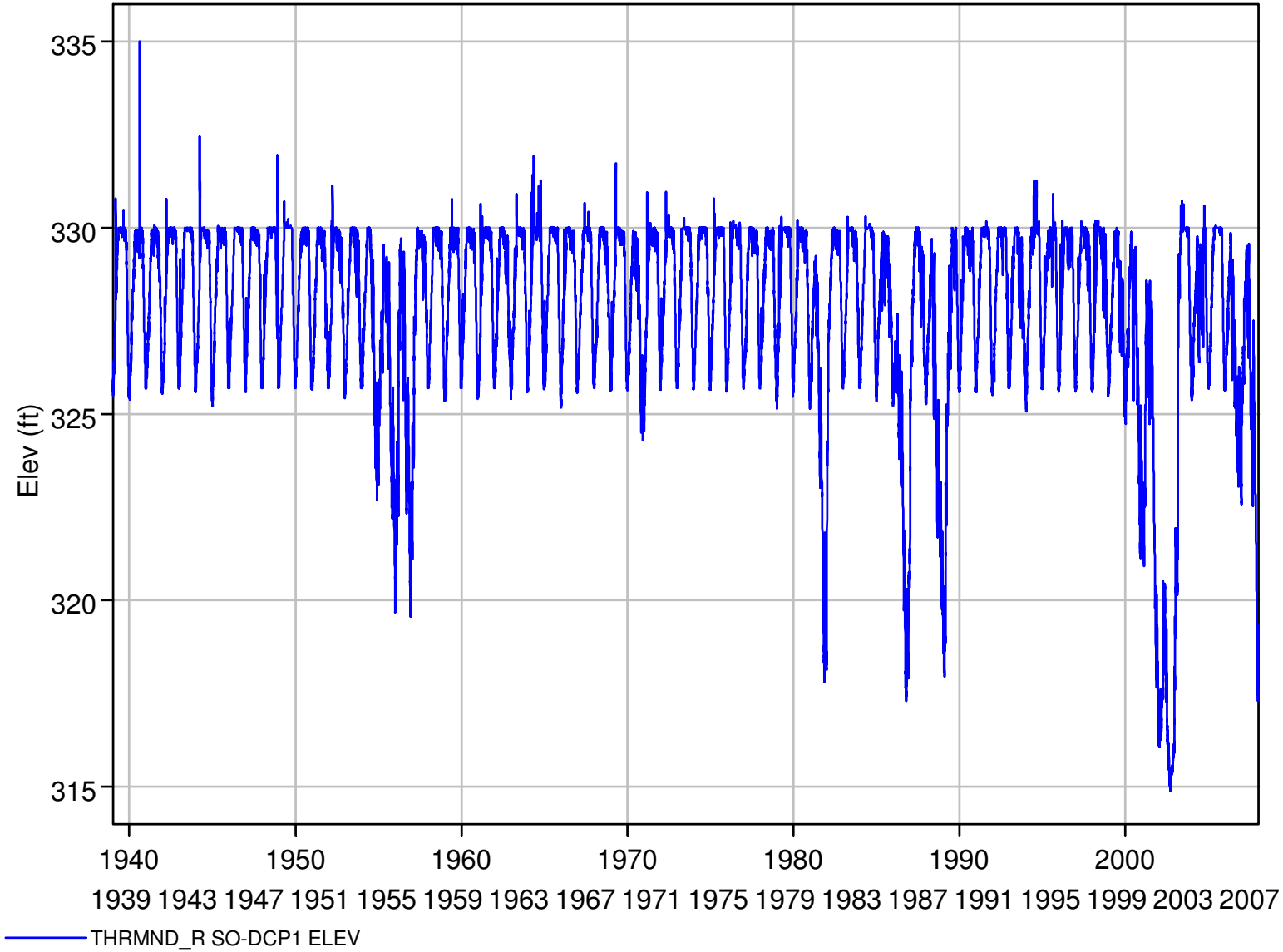
Demand Shortage (cfs)	At-site Flow Requirement Shortage (cfs)	Minimum Reservoir Storage (acre-feet)	Minimum Percentage Reservoir Storage	Basin-wide Flow Requirement shortage
0	0	523,700	37%	None

Thurmond



Thurmond

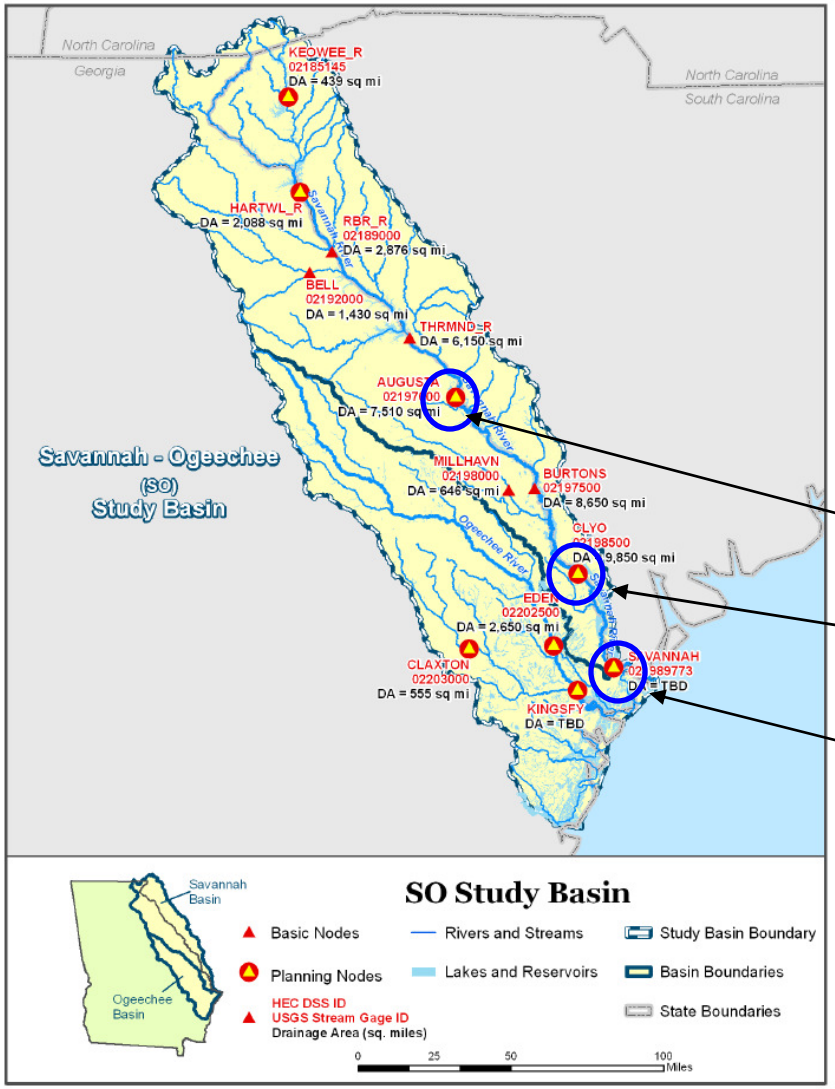
Thurmond Reservoir Elevation



Gap at Thurmond?

Demand Shortage (cfs)	At-site Flow Requirement Shortage (cfs)	Minimum Reservoir Storage (acre-feet)	Minimum Percentage Reservoir Storage	Basin-wide Flow Requirement shortage
0	0	135,000	13%	None

Augusta, Clyo, and Savannah



Augusta

Clyo

Savannah

Gap at Augusta, Clyo, and Savannah?

Demand Shortage (cfs)	At-site Flow Requirement Shortage (cfs)	Minimum Reservoir Storage (acre-feet)	Minimum Percentage Reservoir Storage	Basin-wide Flow Requirement shortage
0	0	523,700 at Hartwell	37% At Hartwell	None

Gap at Augusta, Clyo, and Savannah?

Demand Shortage (cfs)	At-site Flow Requirement Shortage (cfs)	Minimum Reservoir Storage (acre-feet)	Minimum Percentage Reservoir Storage	Basin-wide Flow Requirement shortage
0	0	135,000 at Thurmond	13% at Thurmond	None

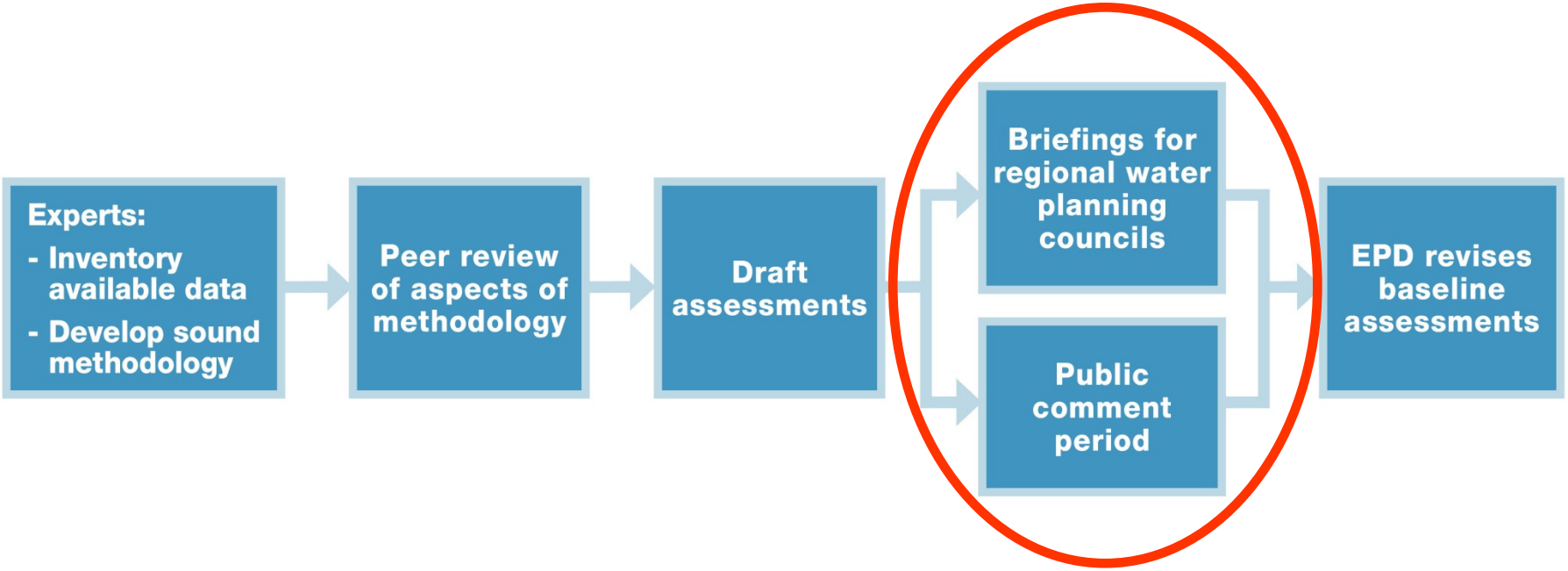
Summary – Savannah River Basin

- Water demand (off stream needs) and Flow Regime (instream needs as specified by the Corps' Water Control Plan) can be fully met by available water
- There is reserve storage in the major Corps storage reservoirs' conservation pool through the most critical drought

Summary – Ogeechee River Basin

- Water demand (off stream needs) and Flow Regime (instream needs) cannot be fully met by available water during drought conditions at Claxton, Eden, and Kings Ferry
- This gap is much larger at Claxton than at Eden and Kings Ferry

Resource Assessment Process



Questions