Update of Unimpaired Flow 1994 – 2001

May 14, 2002

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Disclaimer

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Presentation Outline

- Unimpaired Flow Process
- Work in Progress
- Summary Charts

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Unimpaired Flow Defined

- "Historically observed flows adjusted to account for the construction of large surface water reservoirs, withdrawals and returns for municipal and industrial water uses, and withdrawals for crop irrigation."

ACT/ACF Comprehensive Water Resources Study, *Surface Water Availability Volume 1, Unimpaired Flow*, July 8, 1997.

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Unimpaired Flow Purpose

- Observed flow records are the impacts of man-made changes
- Remove changes to measure impacts
- Consistent basis for comparison
- Baseline for all comparisons
- Develop basinwide strategies

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Unimpaired Flow

- Observed Conditions
- Missing Data Fill-in
- Evaporation-Precipitation (impacts)
- Routing - Local Flow Computation
- Withdrawals/Returns (PIPES)
- Agricultural Withdrawals
- Flow Smoothing

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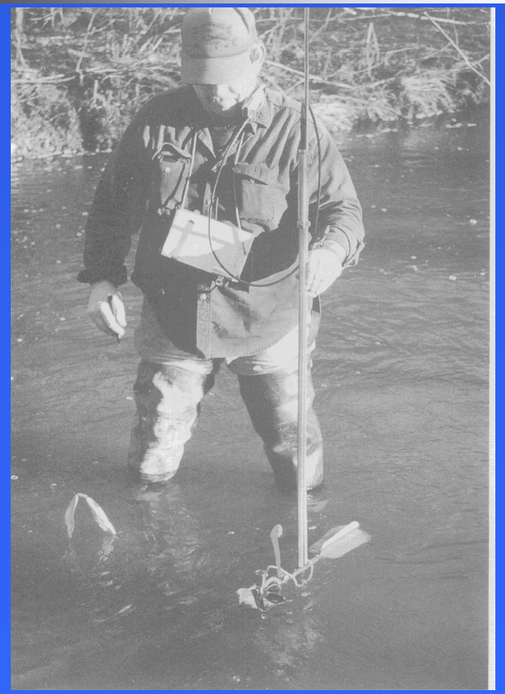
Observed Conditions

- USGS Gages
- Corps Gages
- Corps Projects
- Power Company projects



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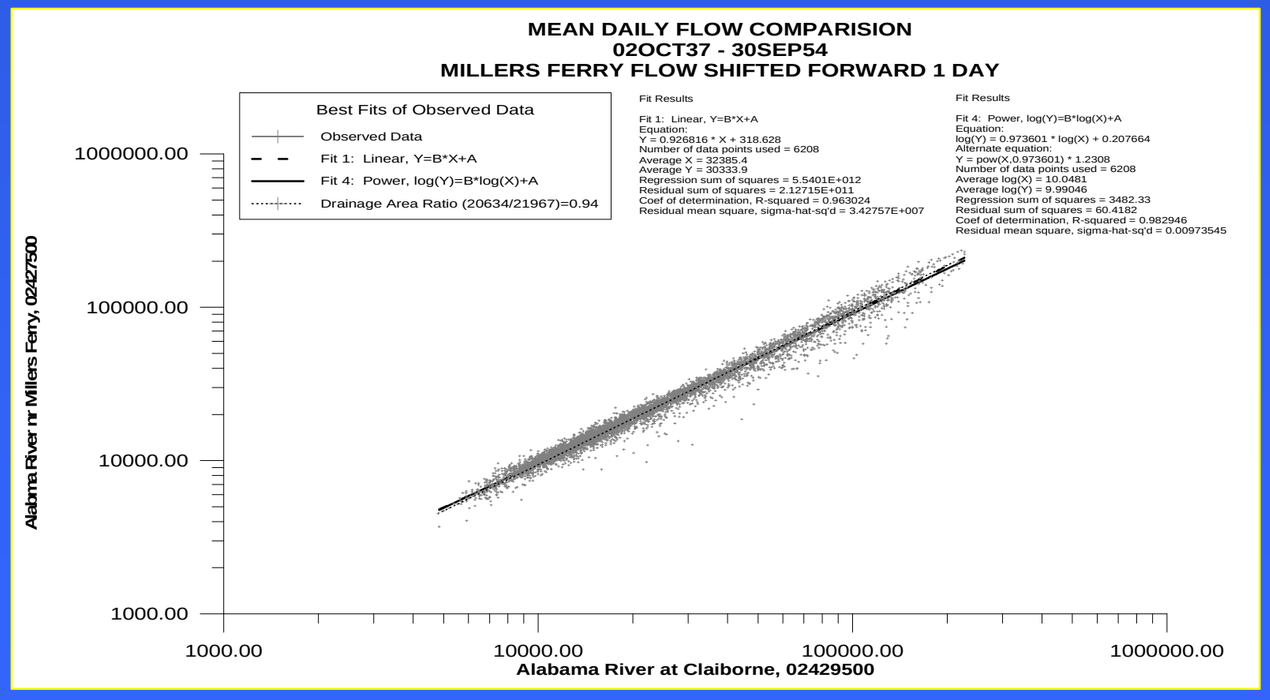
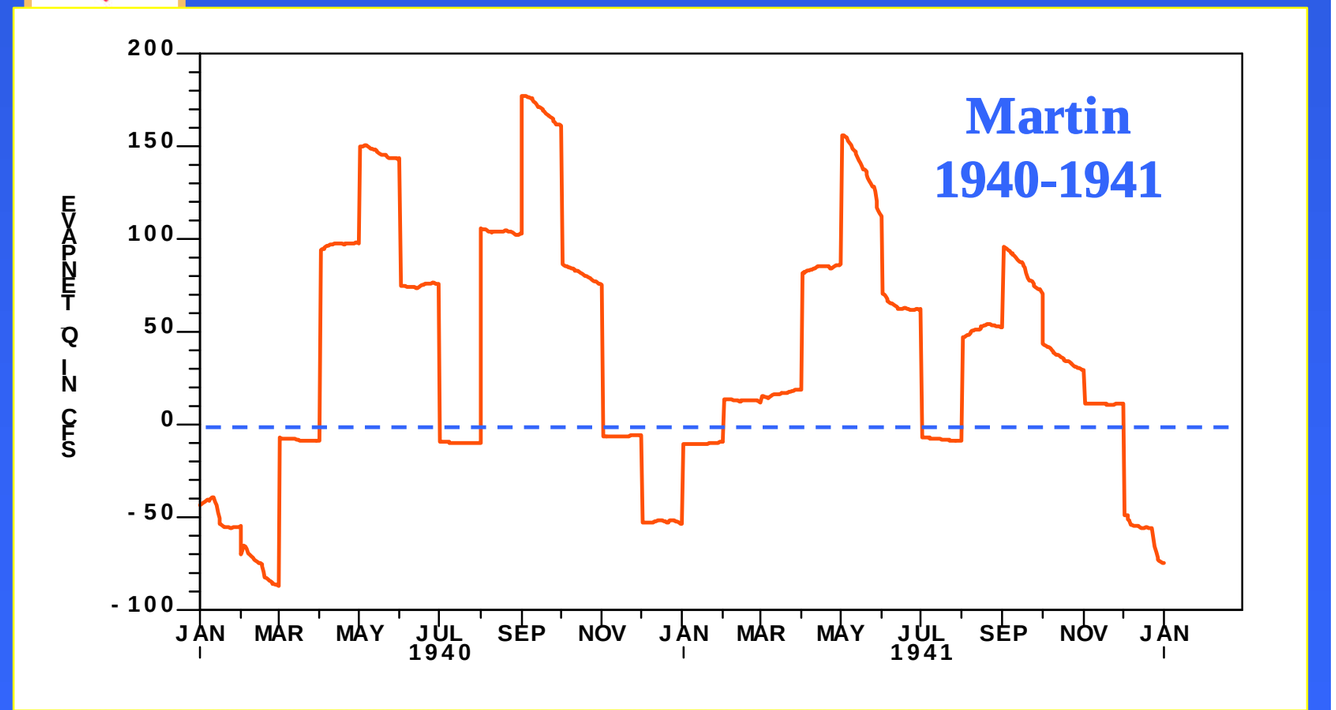
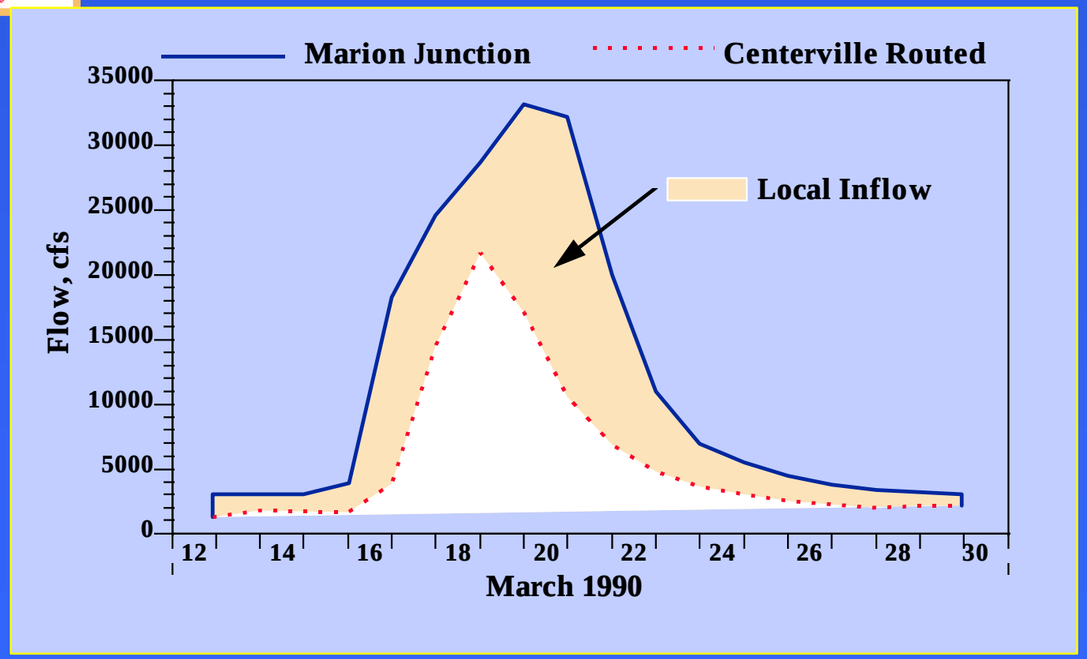
Missing Data Fill-In



Evaporation - Precipitation



Compute Local Flow



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Reservoir Impacts

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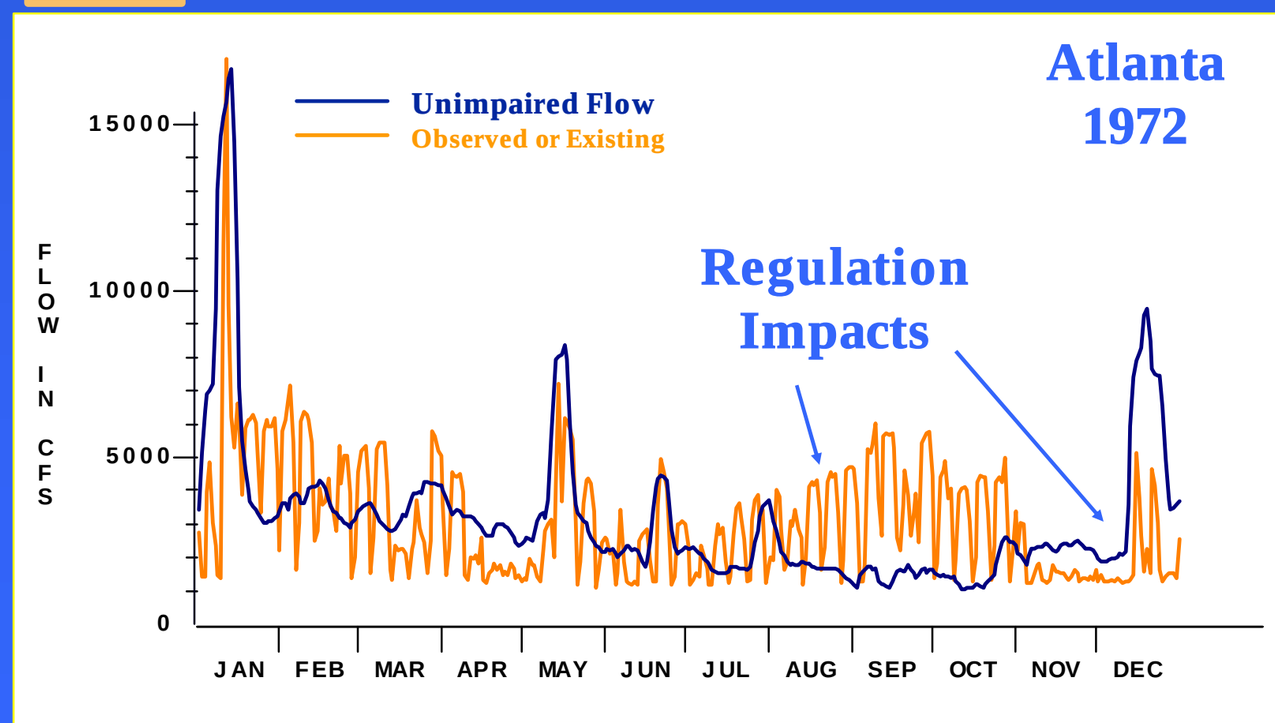
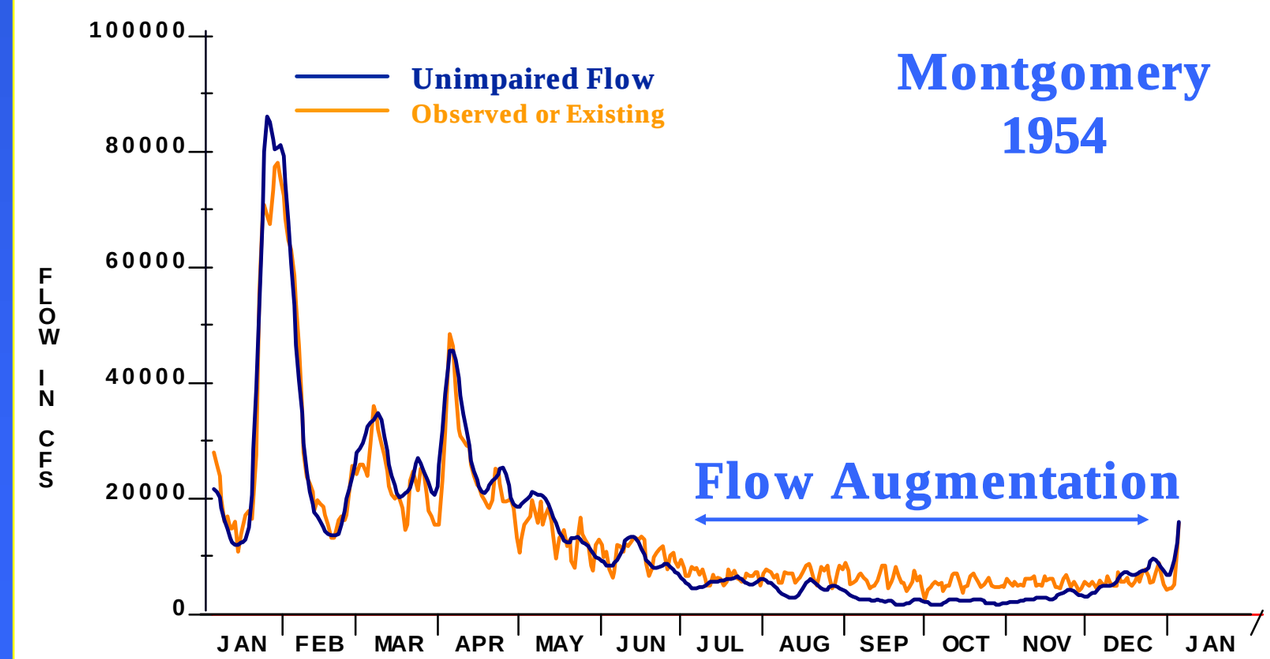
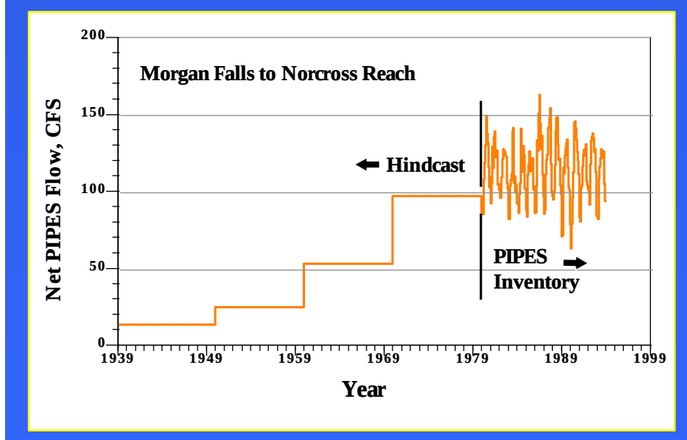
ACF Reservoir Regulation Impacts

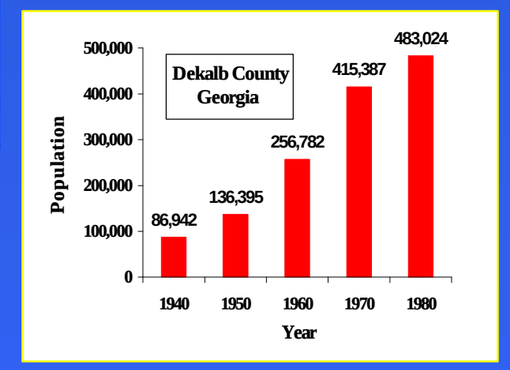


ACT Reservoir Regulation Impacts



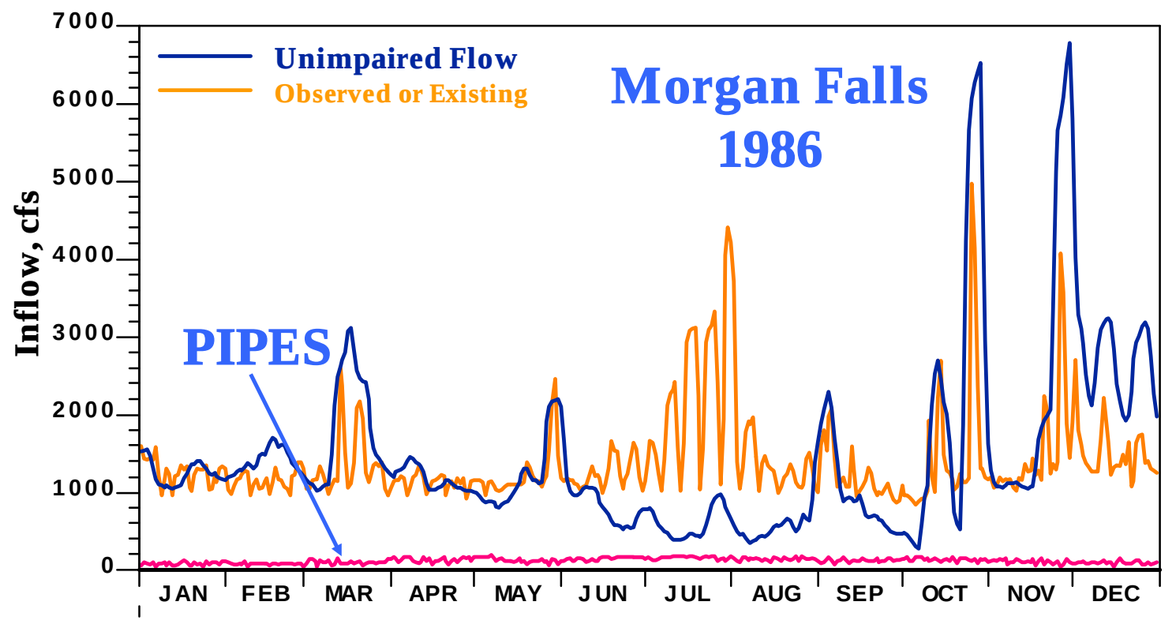
Industrial & Thermal


Morgan Falls to Norcross Reach
Net PIPES Flow, CFS
200
150
100
50
0
Hindcast
PIPES
Inventory
1939
1949
1959
1969
1979
1989
1999
Year

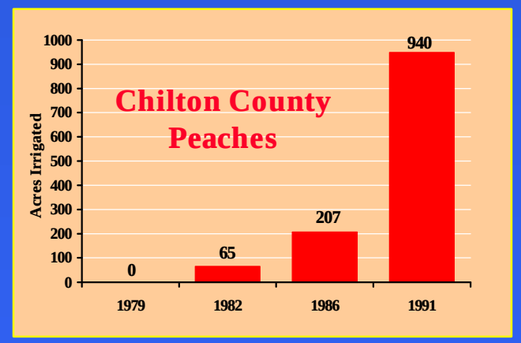

Dekalb County
Georgia
Population
500,000
400,000
300,000
200,000
100,000
0
86,942
136,395
256,782
415,387
483,024
1940
1950
1960
1970
1980
Year

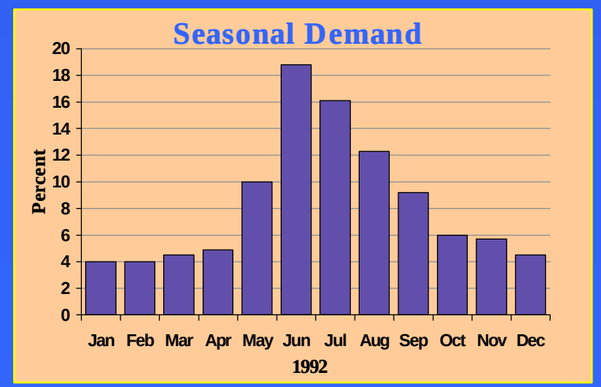
Municipal

Pipes Adjustment

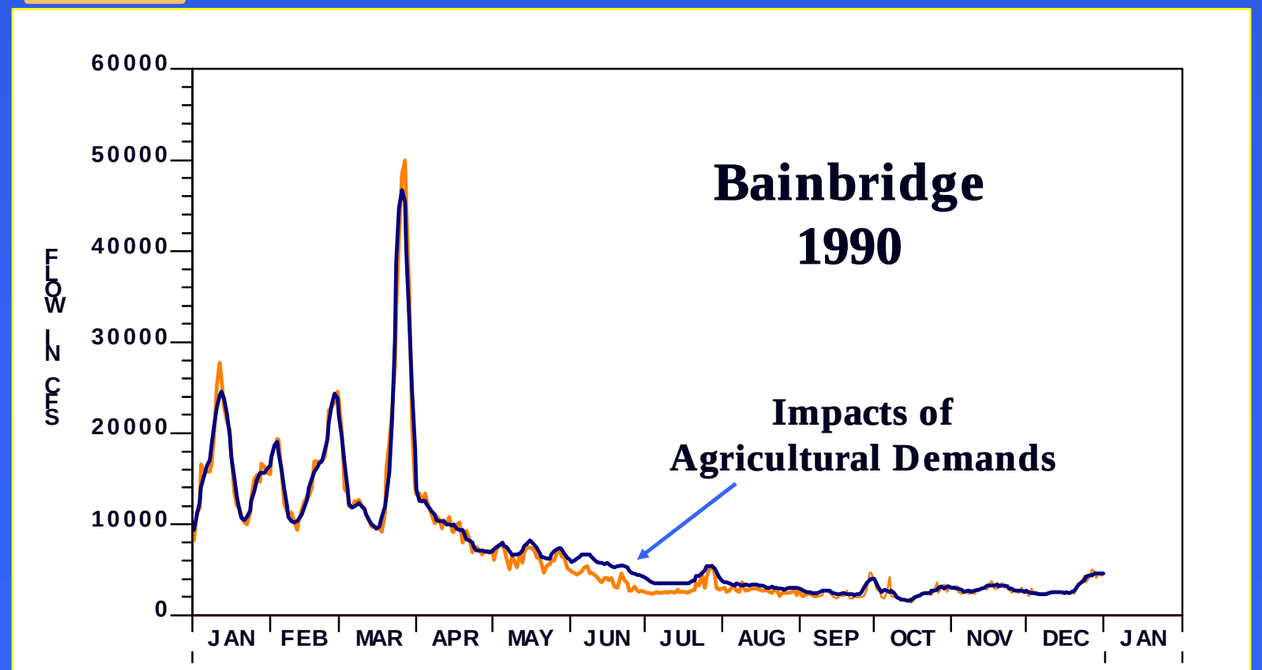


Agricultural Withdrawals

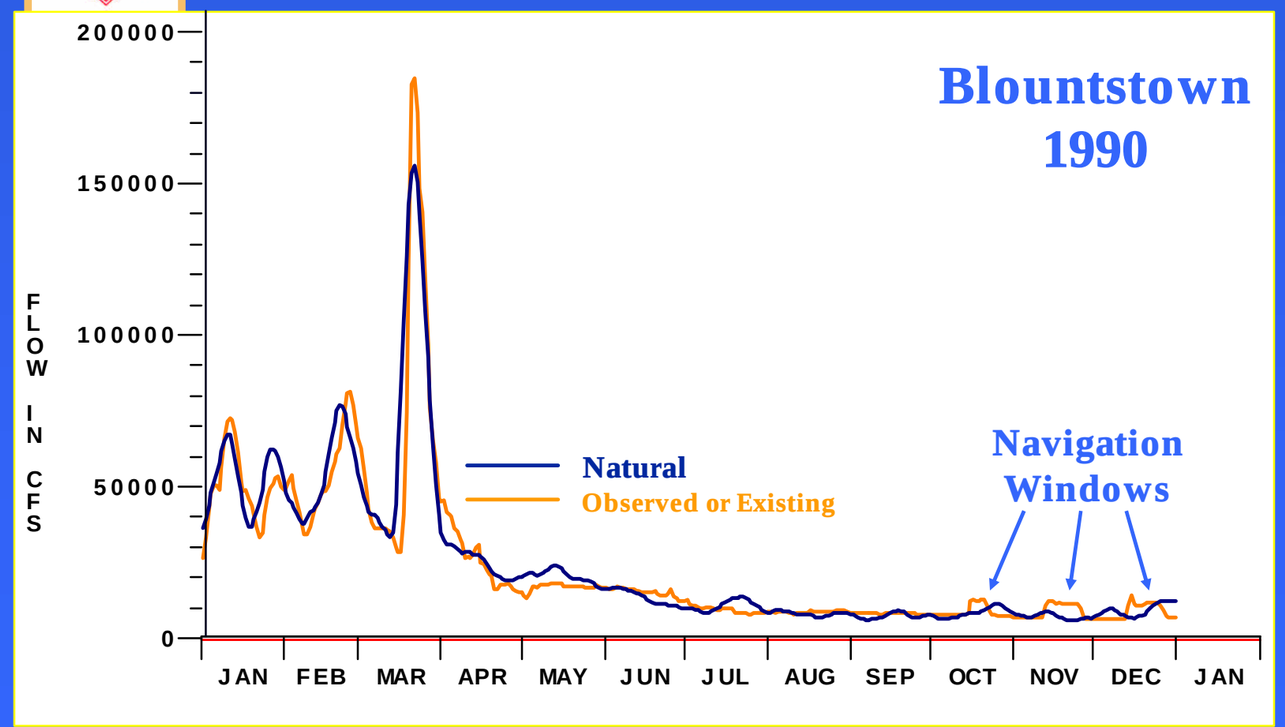




Agricultural Withdrawals



Apalachicola River



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Data From States

- Monthly municipal, industrial and thermal withdrawals and returns
  - AL – Dow Johnston, AL-OWR
  - GA – Nolton Johnson, GA-EPD
  - FL – Ron Bartel, NWFWMD

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Data Reported

- AL –
  - ACT: returns 62 %, withdrawals 55%
  - ACF: returns 62 %, withdrawals 76%
- GA
  - ACT: returns 78 %, withdrawals 38%
  - ACF: returns 71 %, withdrawals 78%
- FL
  - ACF: All estimated based on 1993 data.

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Agricultural Withdrawals

- Used 1995 and 2000 projected demands from Comprehensive Study
- USGS 1995 Water Use by county for AL, GA, FL
- USGS 2000 Water Use Report in review
- Perform comparisons and adjust accordingly

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All Other Data

- Precipitation – NRCS
  - ACF Nov-Dec 2001 recently finalized
- Streamflow –USGS
  - Oct-Dec 2001 provisional data only
  - 2 ACT gages discontinued
- Reservoir Information
  - Mobile District
  - Alabama Power

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Estimation Methods

- Best engineering judgment
- Pipes
  - Averaging and substitution
- Precipitation
  - Nearby gage
- Streamflow
  - Correlation with nearby gage

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Quality Control

- Close coordinating with States
- In-house review, separation of work
- Graphical review of flow set

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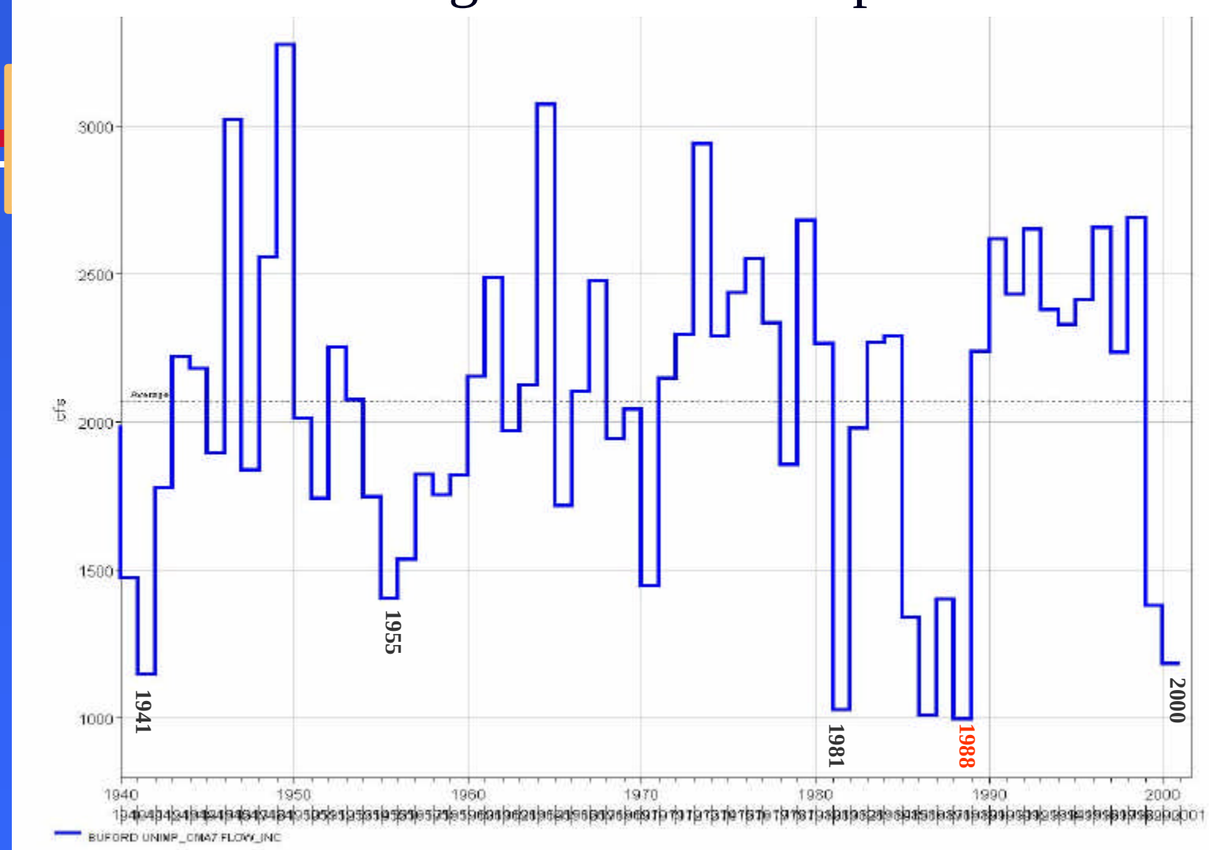
Buford Average Annual Unimpaired Flow



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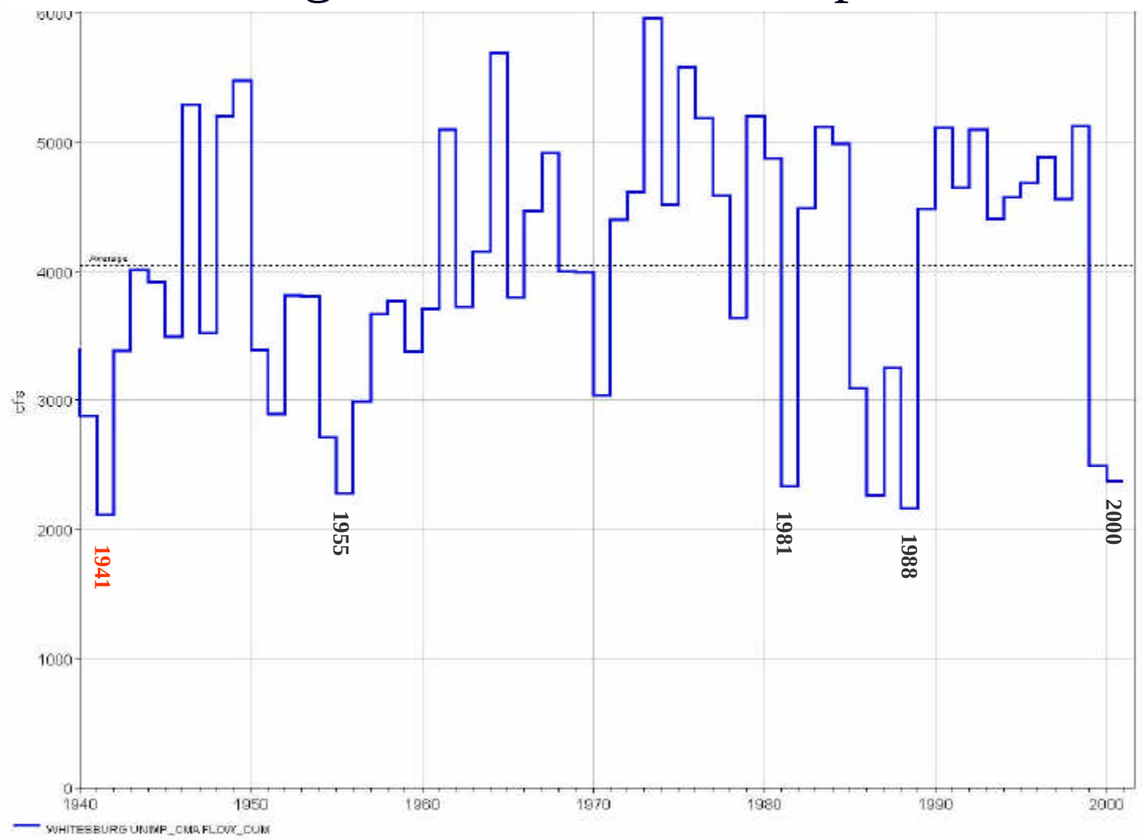
Whitesburg Mean Annual Unimpaired Flow



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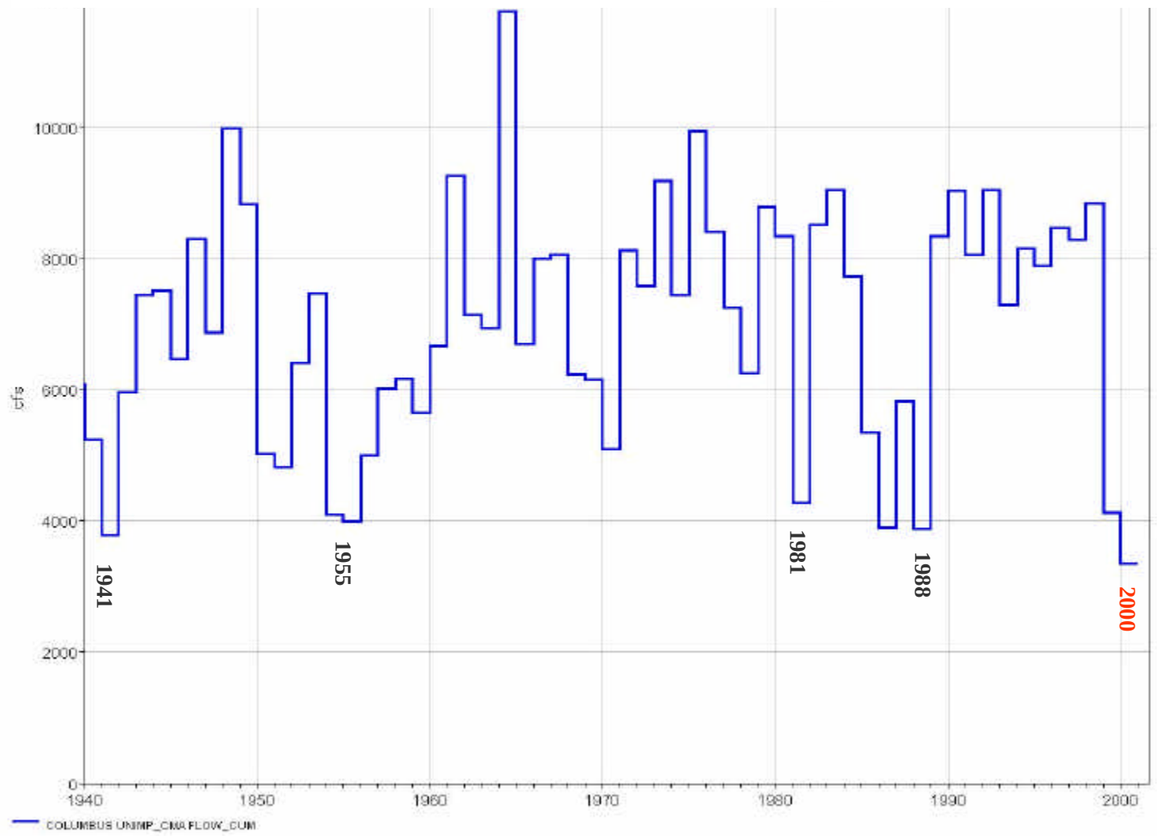
Columbus Mean Annual Unimpaired Flow



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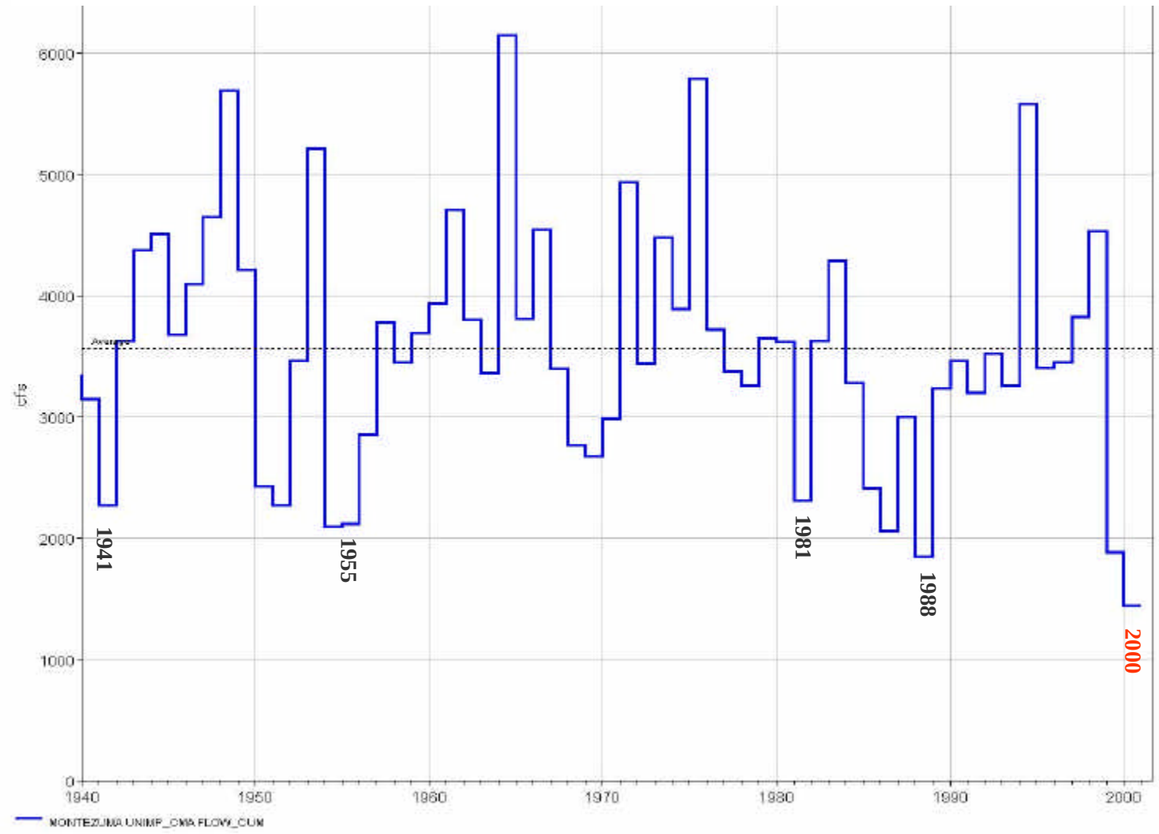
Montezuma Mean Annual Unimpaired Flow



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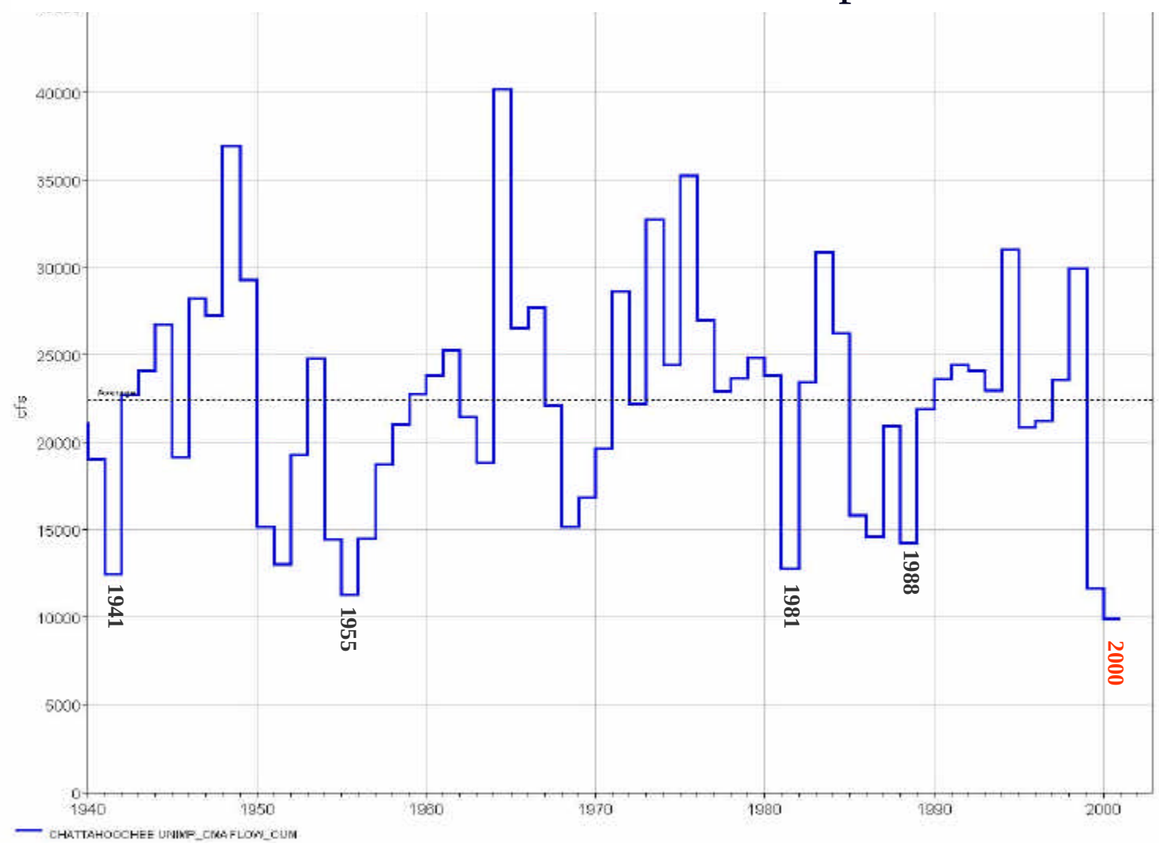
Chattahoochee Mean Annual Unimpaired Flow



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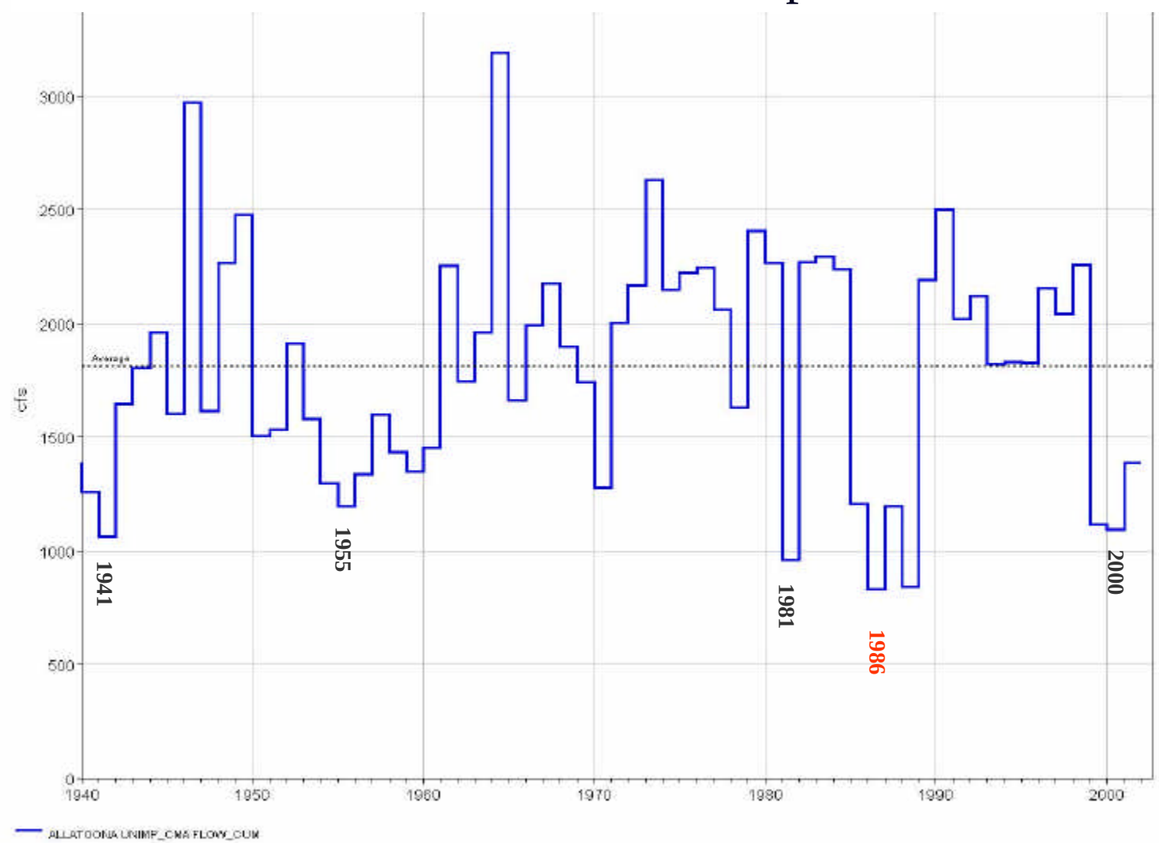
Allatoona Mean Annual Unimpaired Flow



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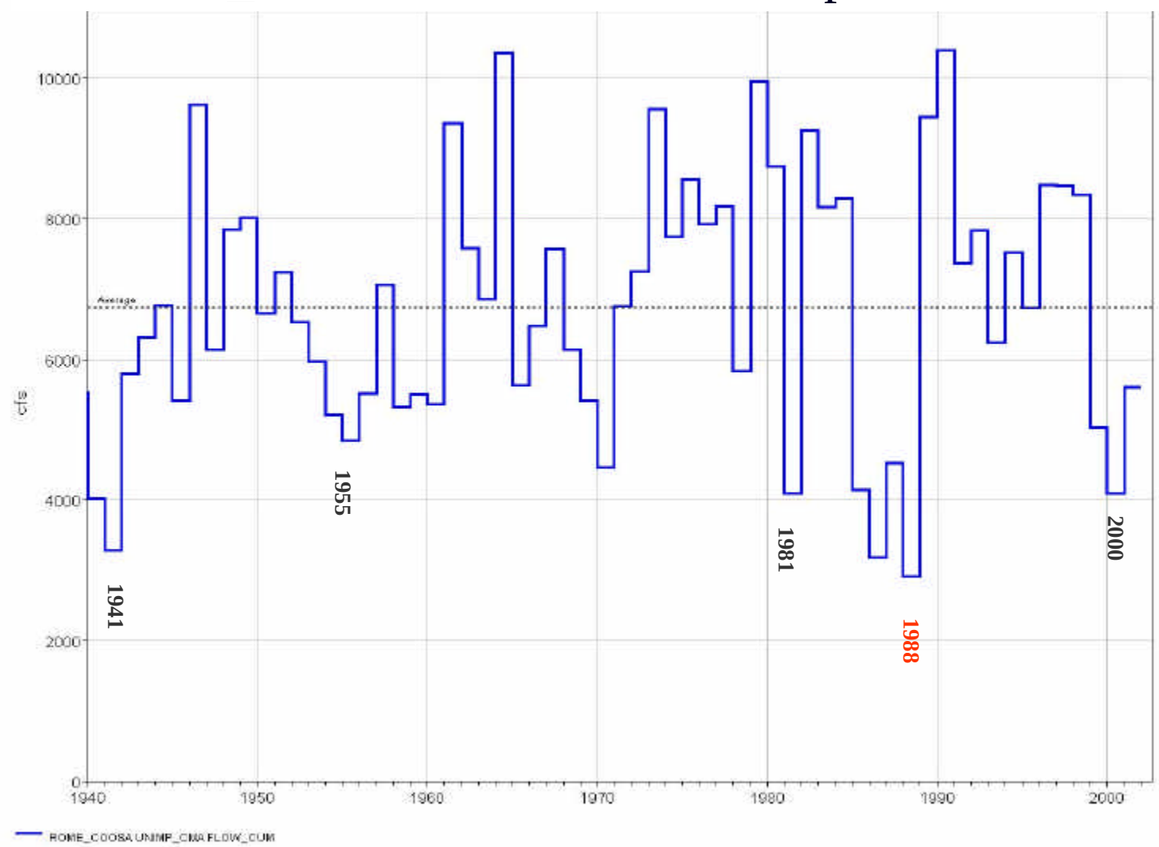
Rome_Coosa Mean Annual Unimpaired Flow



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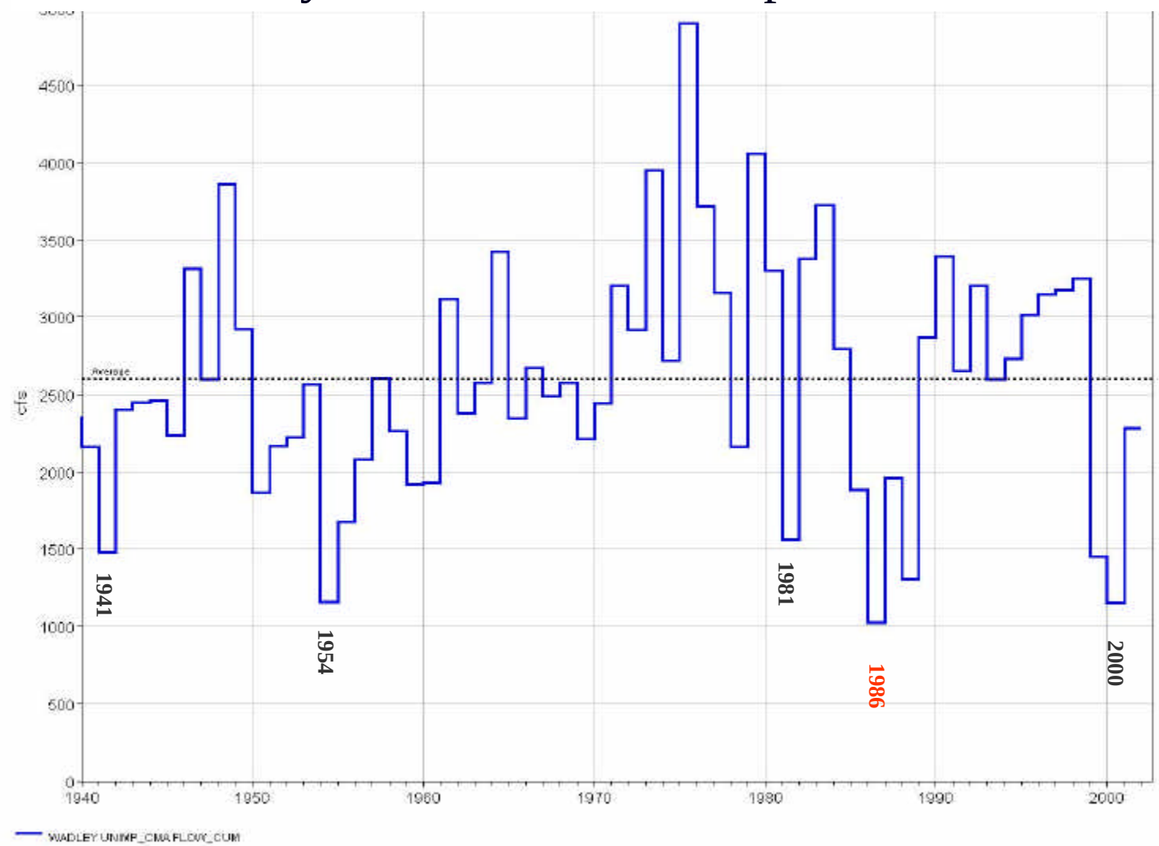
Wadley Mean Annual Unimpaired Flow



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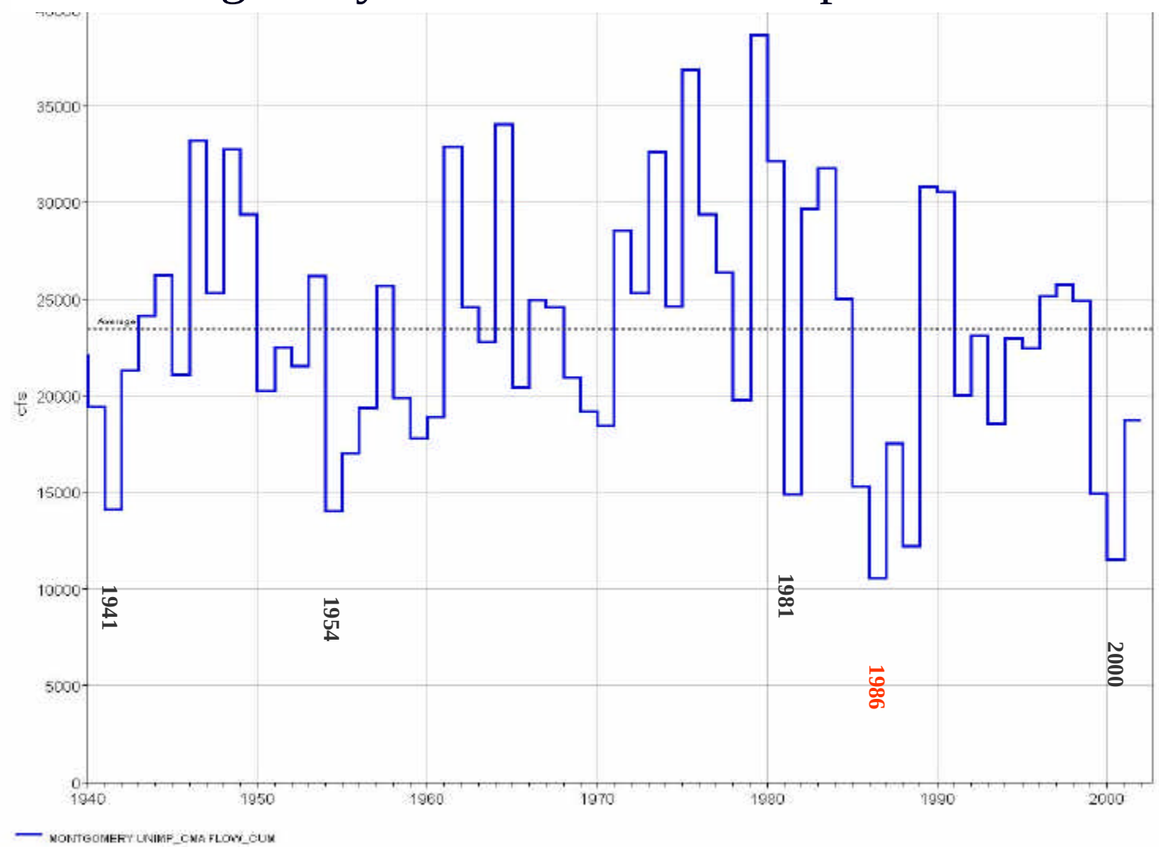
Montgomery Mean Annual Unimpaired Flow



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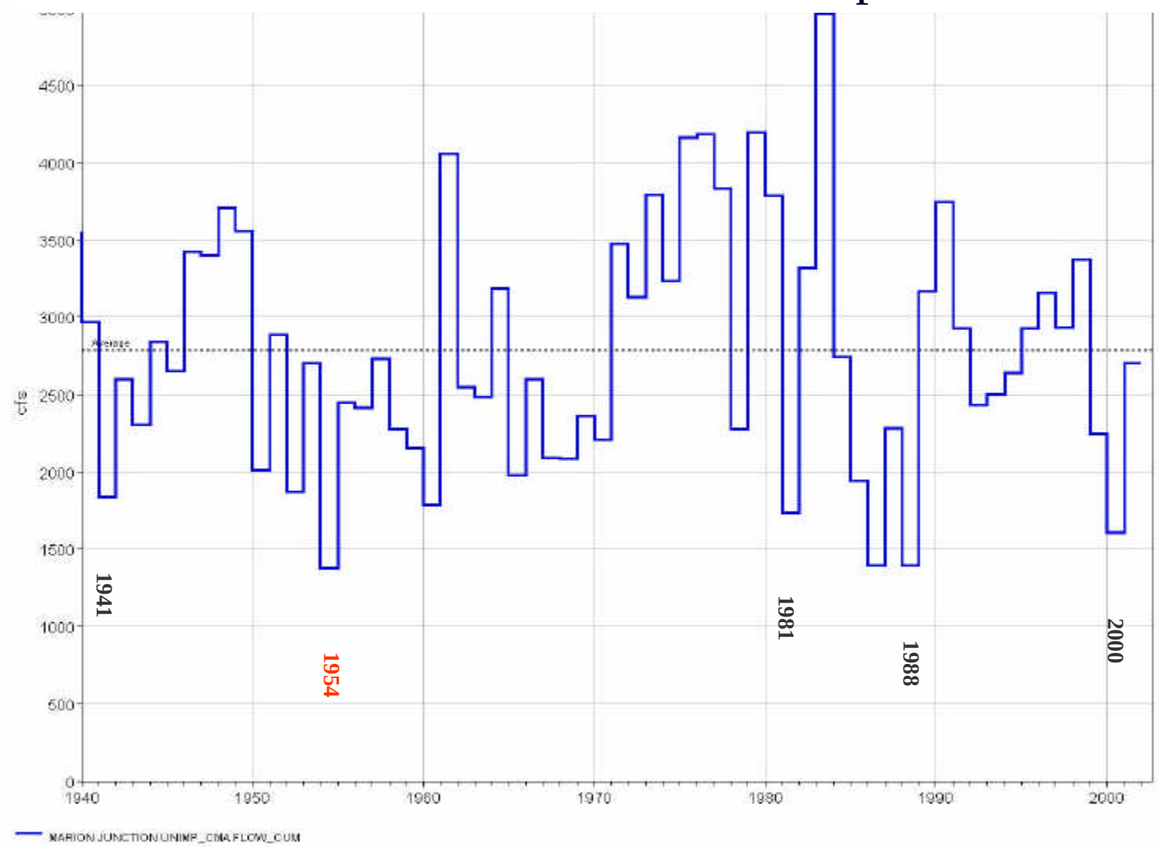
Marion Junction Mean Annual Unimpaired Flow



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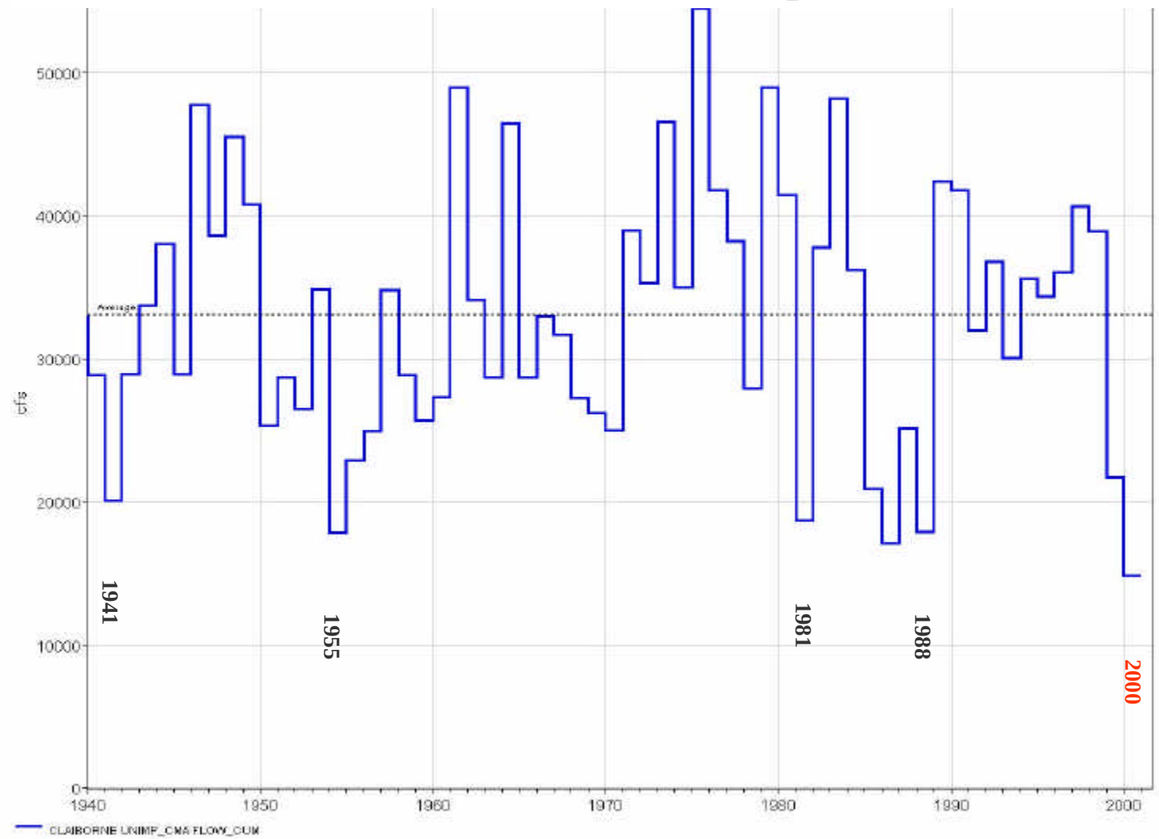
Claiborne Mean Annual Unimpaired Flow



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Net Demands

- Net Demands = Withdrawals - Returns

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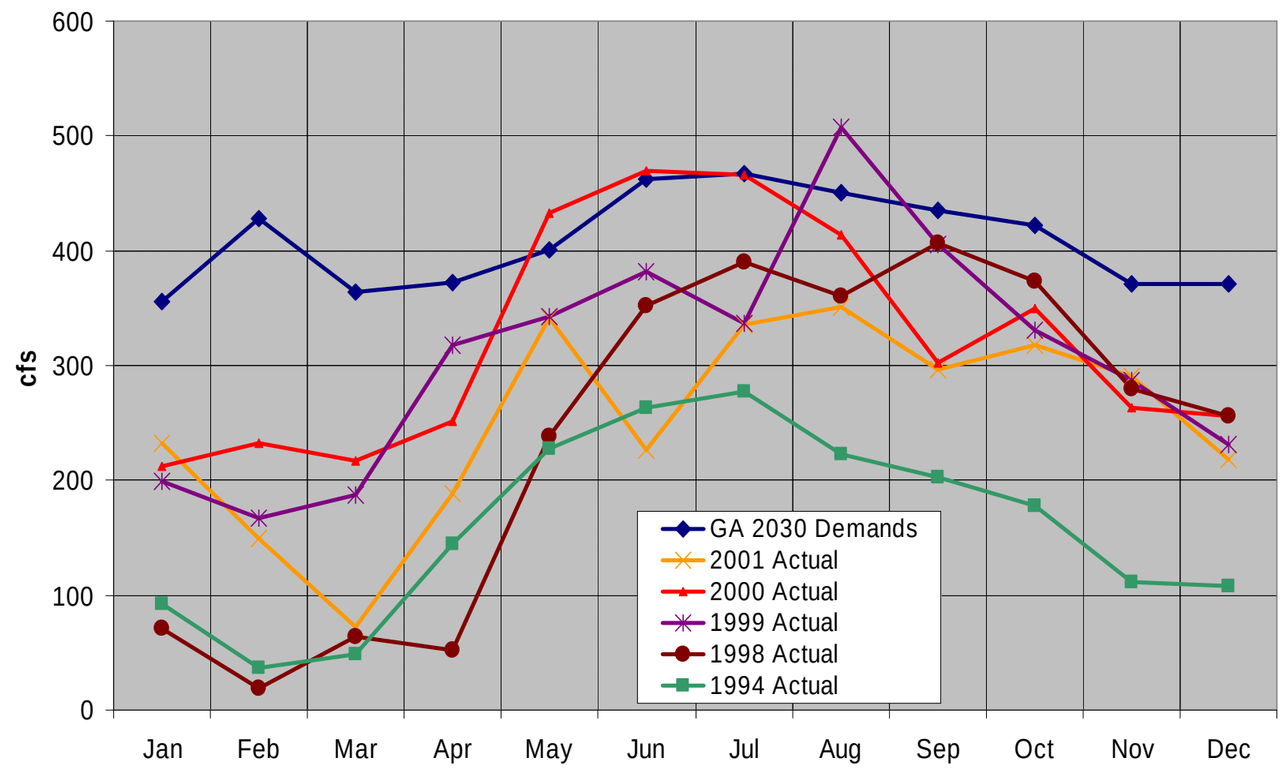
Buford to Whitesburg Net Demand Comparison



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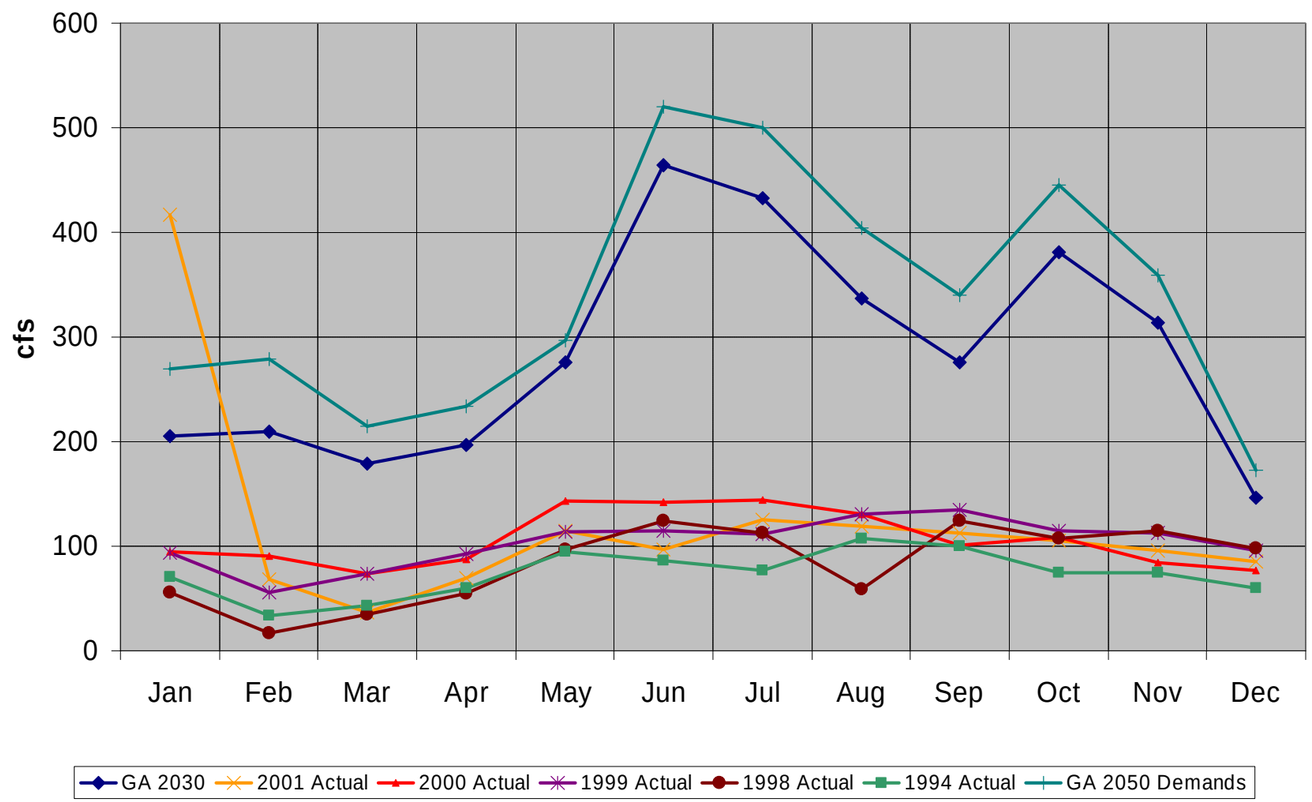
Columbus to Whitesburg Net Demand Comparison



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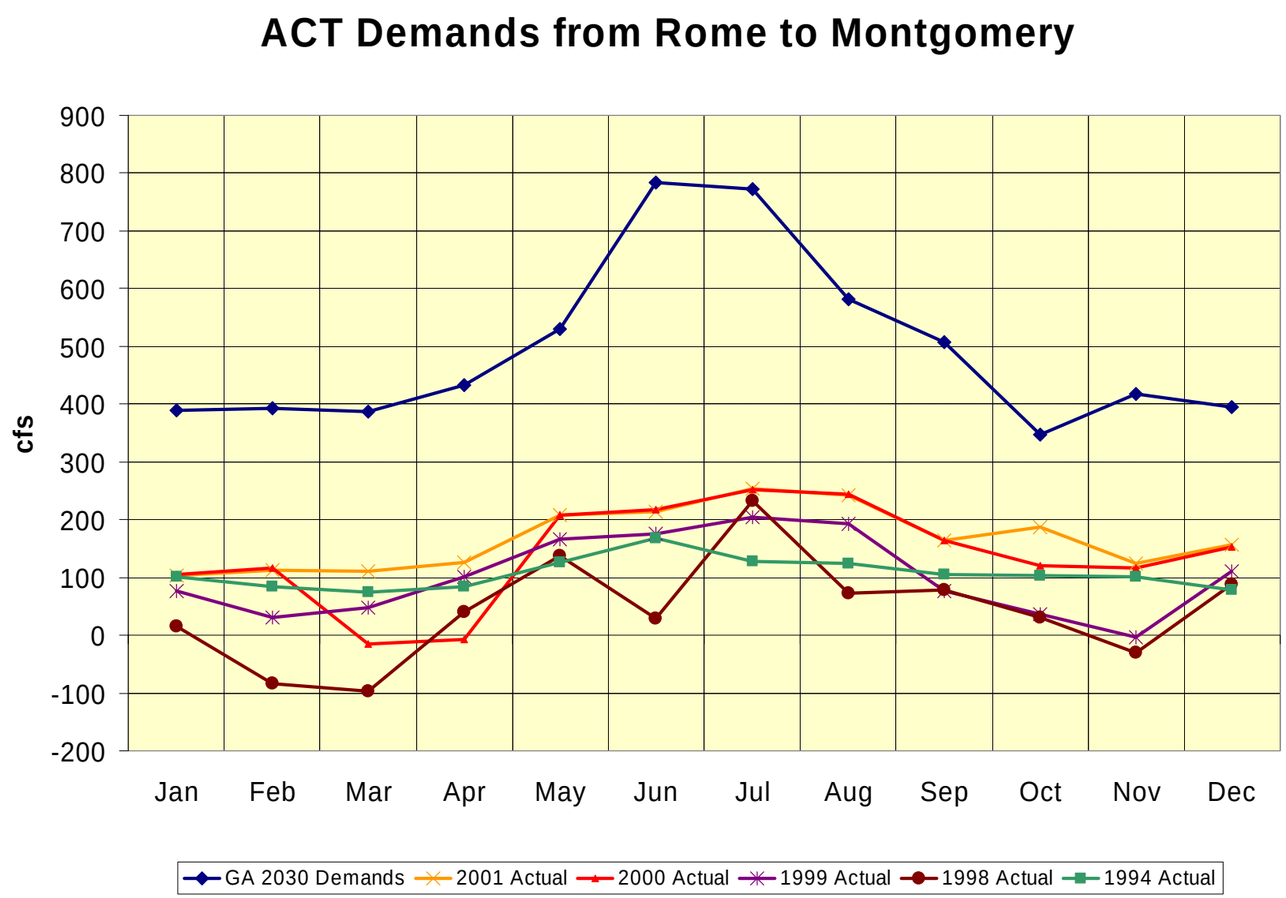

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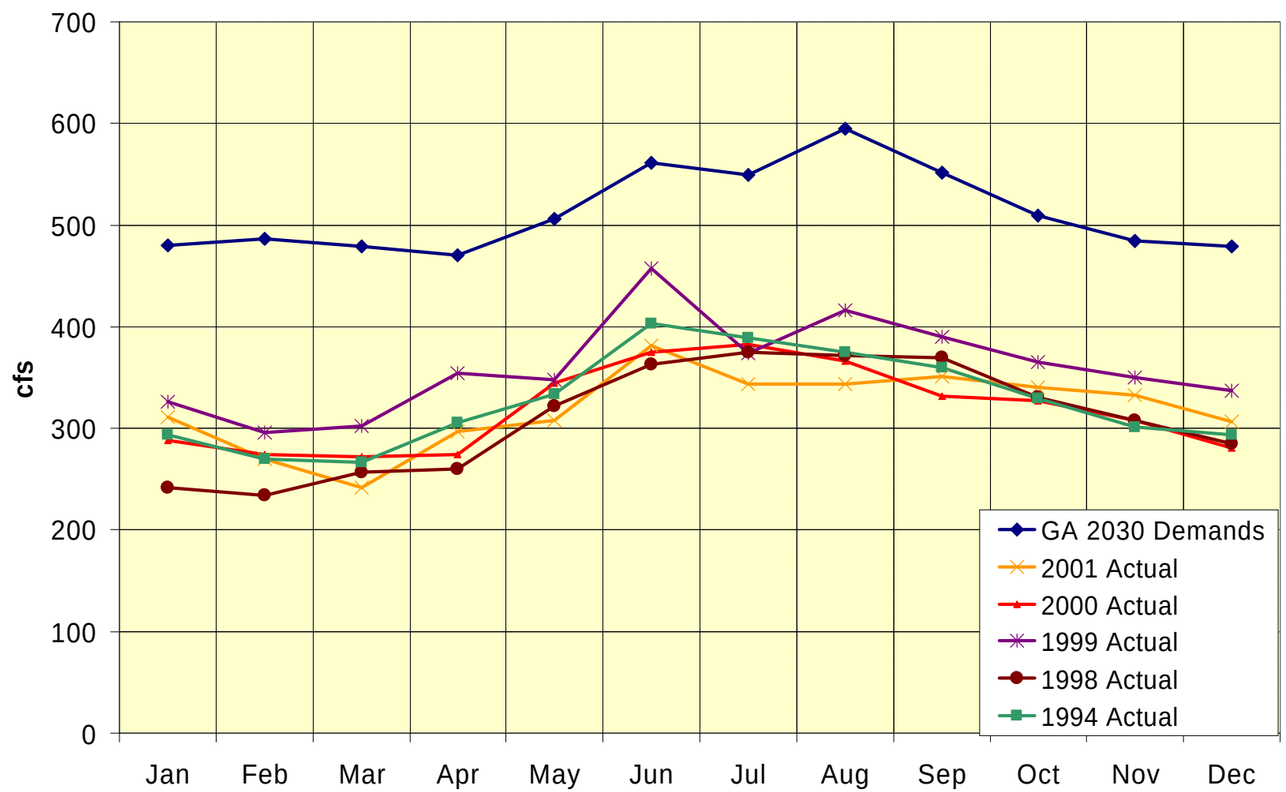
ACT Demands Above Rome, GA



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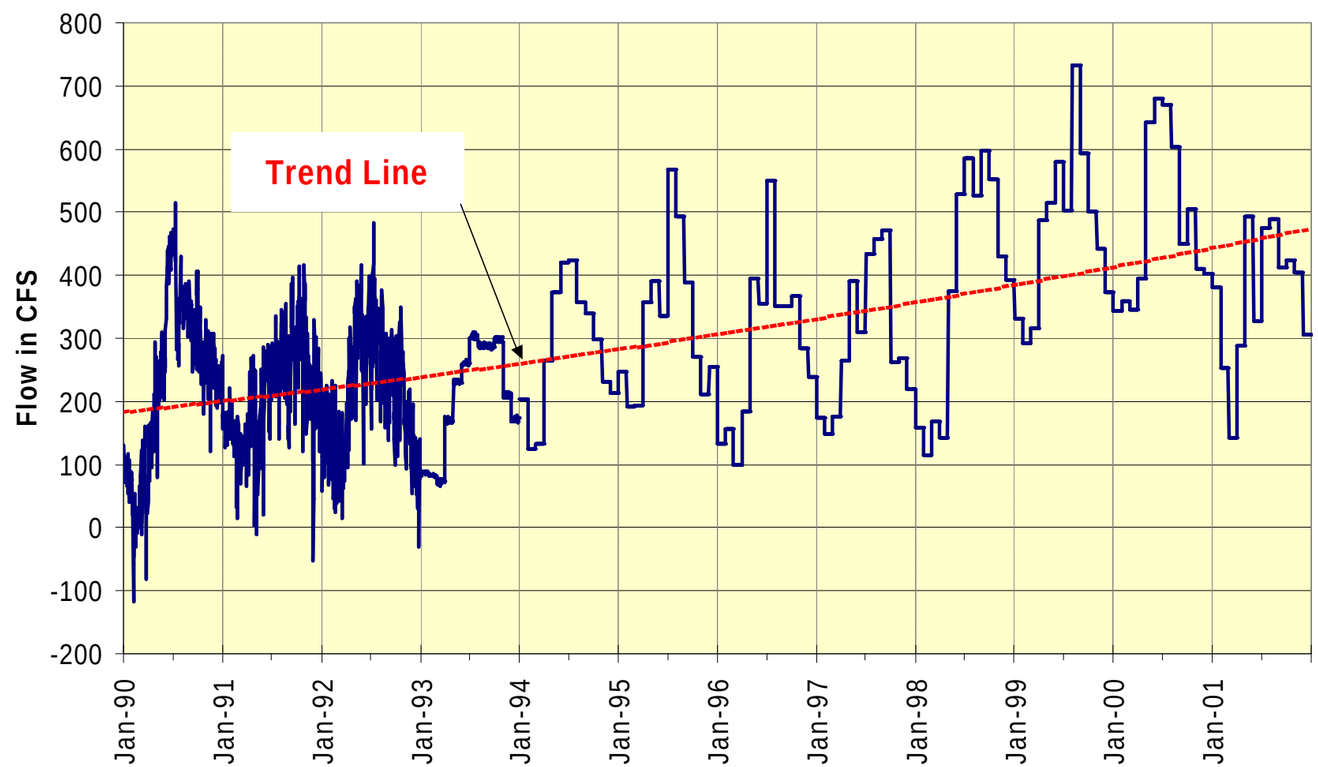
Whitesburg to Lake Lanier Net Demands



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Updated Files

- Publicly available data

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