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# Clarence Cannon Conundrum: relinquish water storage or not?

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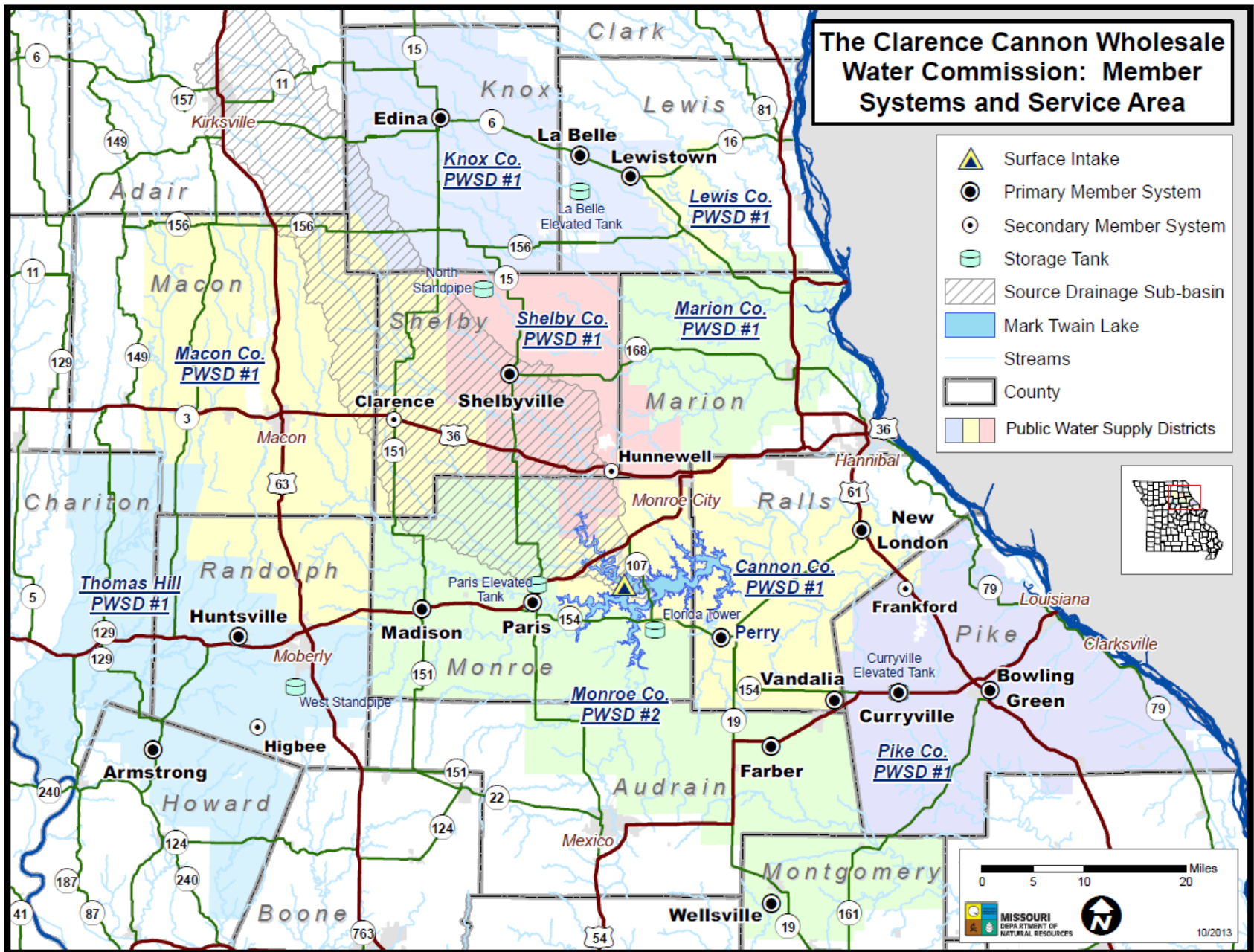
Yapo N'Guessan, Ph.D.

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# Background

- Clarence Cannon (then Joanna Reservoir) was first proposed in 1937 to address flooding by Salt River in Northeast Missouri
- Authorized in the Flood Control Act - 1962
- Multipurpose project – hydroelectric power, flood damage reduction, recreation, fish and wildlife conservation, water supply and navigation



Source: Clarence Cannon Wholesale Water Commission

# Definitions

- Future-use storage: water supply storage that has not been activated by the user
- Present-use storage: water supply storage that is currently being used
- Activation: commencement of use of water stored

# Clarence Cannon Contracts

- 3-way contract between U.S. Army Corps, State and CCWWC
- Water Storage contracts: 20,000 acre-feet
  - State of Missouri – 13,125 acre-feet (11 MGD) – future use
  - CCWWC – 6,875 acre-feet (5 MGD) – present use

# State of Missouri's payments

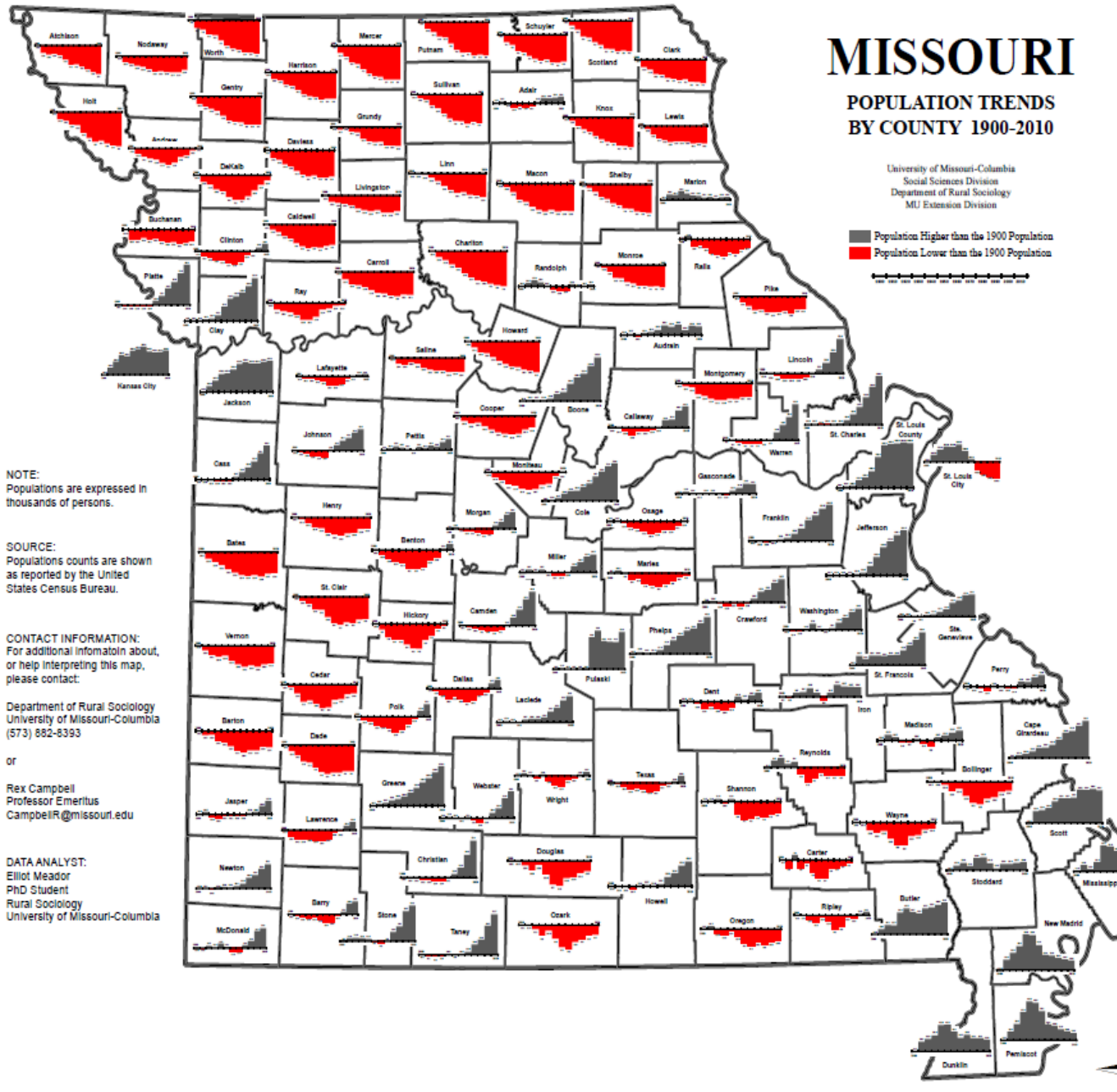
- O&M and interest:
  - Range - \$435,000 to \$835,000 in O&M and interest
  - The difference in payments are largely due to activities taken up by the Corps
  - \$11.3 million due in 2038 for the cost of dam
  - State of Missouri continues making O&M payments beyond 2038 as long as water is used
  - O&M payments are proportional to water use

# MISSOURI

## POPULATION TRENDS BY COUNTY 1900-2010

University of Missouri-Columbia  
Social Sciences Division  
Department of Rural Sociology  
MU Extension Division

Population Higher than the 1900 Population  
Population Lower than the 1900 Population



**NOTE:**  
Populations are expressed in thousands of persons.

**SOURCE:**  
Populations counts are shown as reported by the United States Census Bureau.

**CONTACT INFORMATION:**  
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# Policy options: to relinquish or not?

- Water Resources Reform and Development Act 2014 provisions:
  - Section 1046 (d): Option for relief from contractual obligations on future-use storage for water supply
  - Section 7001 (c): Project modification to existing project
- Policy options:
  1. In the wake of population decline, does it make sense to hold on to water storage in anticipation of future growth?
  2. Release water storage and reduce payments on interest, O&M and capital costs?
  3. What if there's growth in the future?

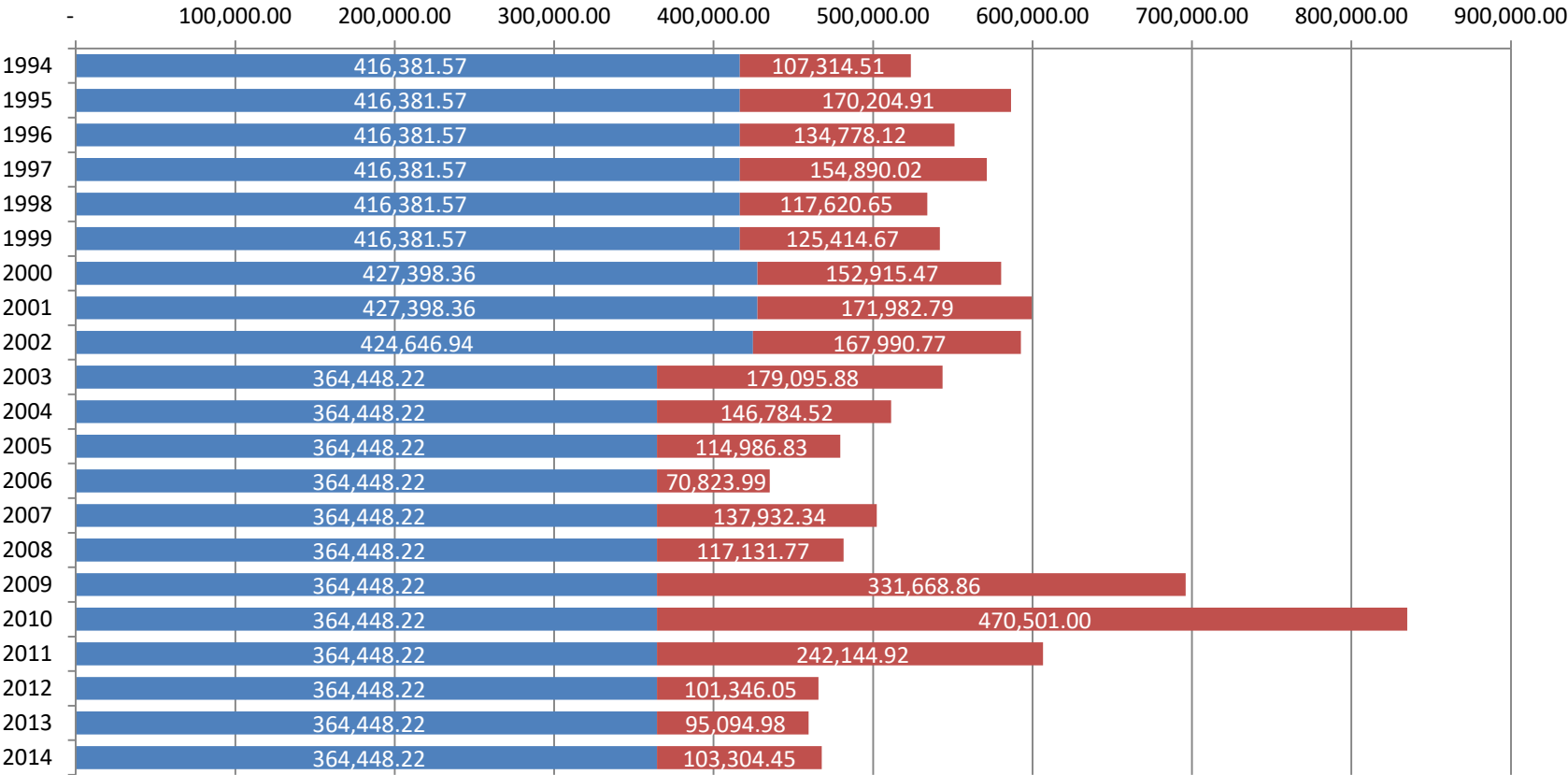
# State's cost calculations

- Missouri's payment:
  - Annual Operation and Maintenance:  
 $7.24\% \times 13,750/20,000 \times \text{Annual O\&M}$
  - Annual Interest rate – 3.22%  
 $3.22\% \times 11,318,268 = \$95,094.98$
- FY 2016 payment:
  - Interest = \$364,448.22
  - O&M = \$ 90,710.99
  - Total = \$455,159.21

# Future use

- When is the payment of \$11.3 million due?
  - If no water storage is converted to present use it's due in 2038 when the contract ends
  - Or when State of Missouri converts future use to present use i.e., starts using the water
  - An option of amortizing that \$11.3 million exists if State of Missouri uses that water

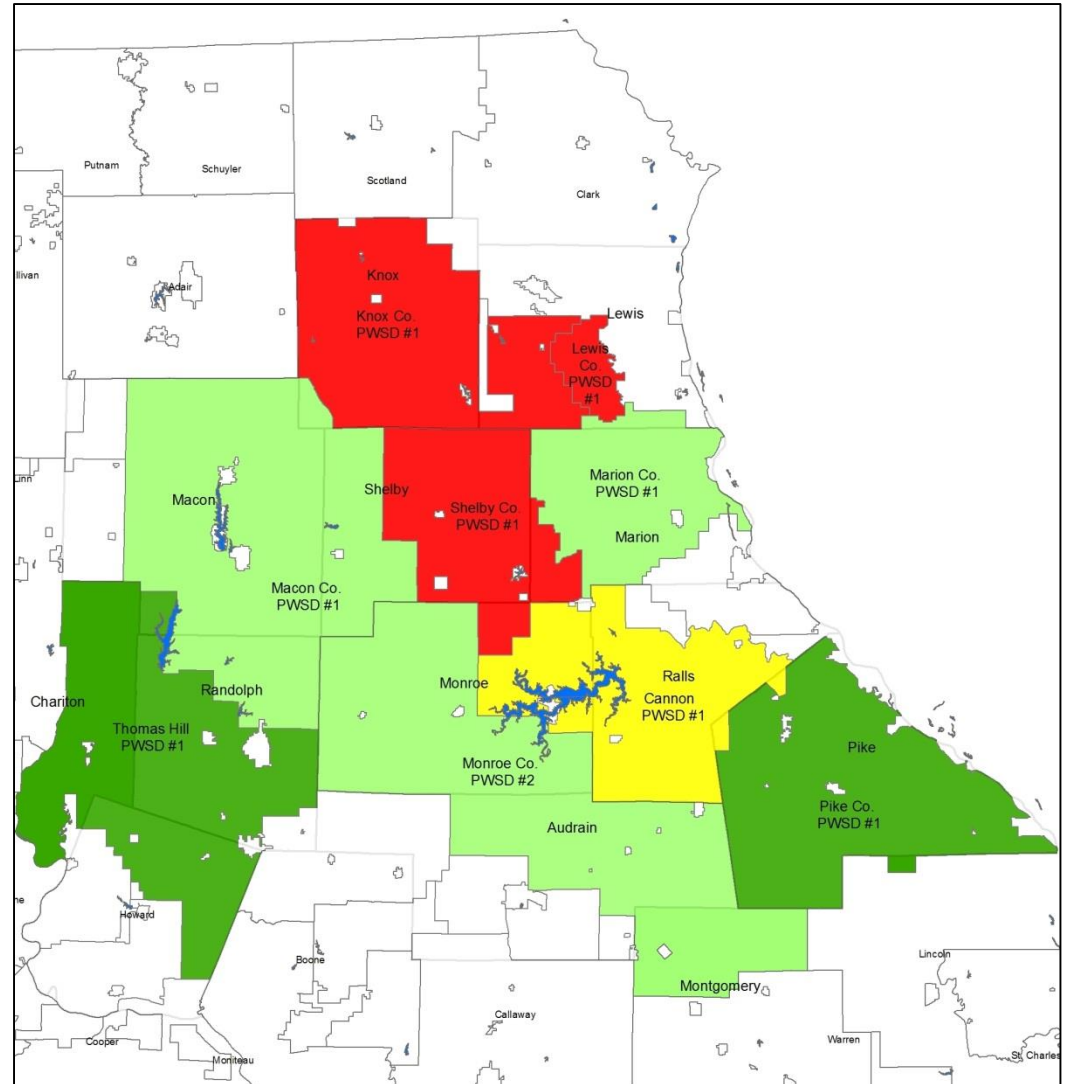
# Missouri's Payments 1994-2014



■ Interest ■ O&M

# Marketability potential

- Systems with population decline
- Systems considering dropping out
- Systems with small population growth
- Systems with high population growth



# Reasons to request relief from contract

- Population in a declining trend – less customers
- 13,125 acre-feet has not been used or called to use in 25 years (even in severe droughts)
- Barriers to system expansion
  - Physical – infrastructure upgrades
  - Economic – fewer grants, higher rates for communities, not an agreeable solution, not so robust economy
  - Systems treating their own water, dropping out of CCWWC's service

# Risks of contractual release

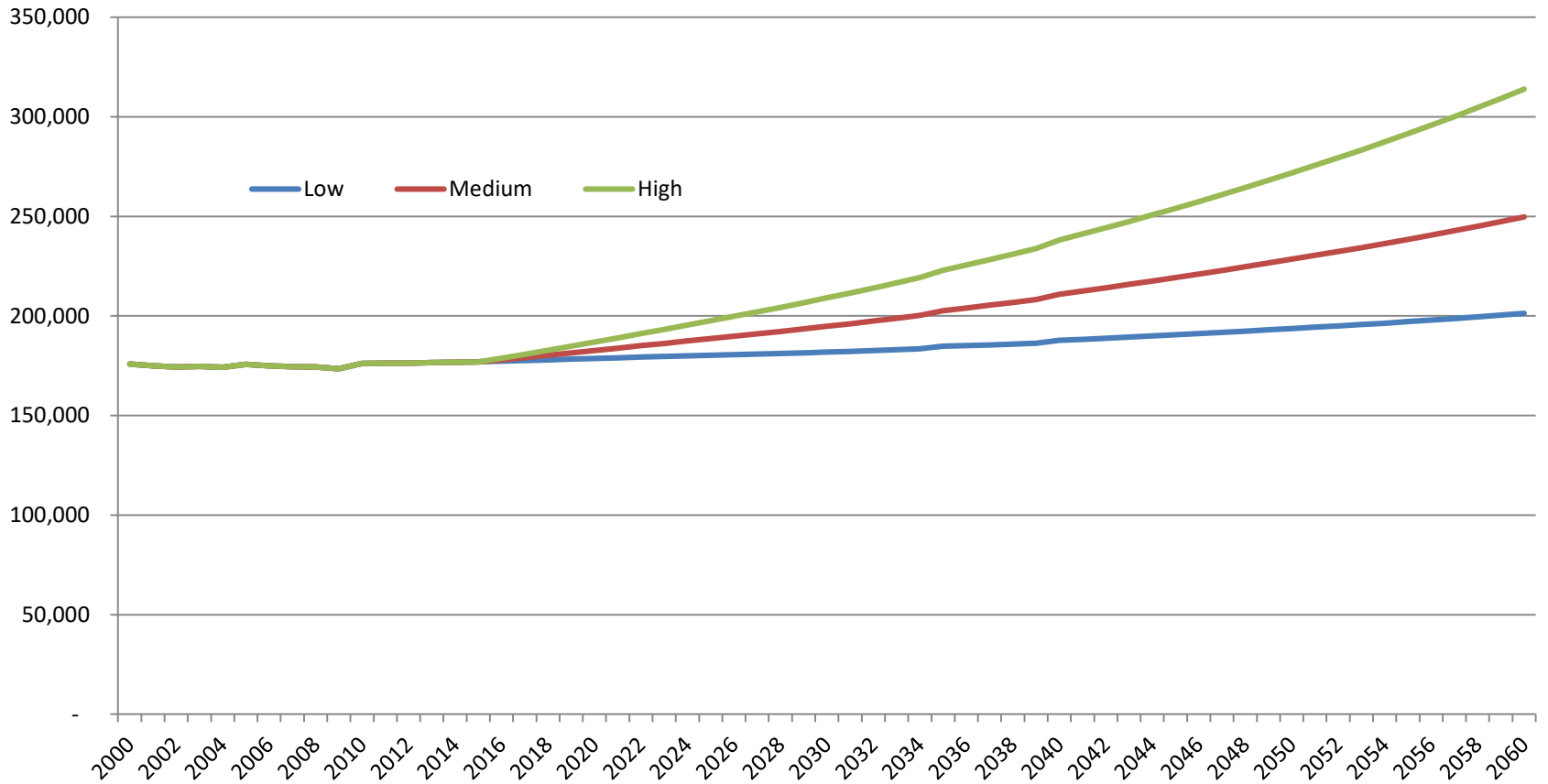
- Risks of release from contractual obligations:
  - If water demand increases, State will have to pay a higher cost to buy back storage
  - If a severe drought occurs, the stored water can supplement existing sources
  - If systems determine that infrastructure upgrades are expensive, they may revert back to CCWWC demanding water
  - A water-intensive operation/firm/employer if relocates in Northeast MO can trigger a growth in population and stabilize the economy and increase water demand
  - If we revert back storage to the Corps, the uncontracted water storage can be claimed on a first-come-first basis or by other authorized purpose
  - Need to start over on interest payments and interest rates could go up

# Scenarios

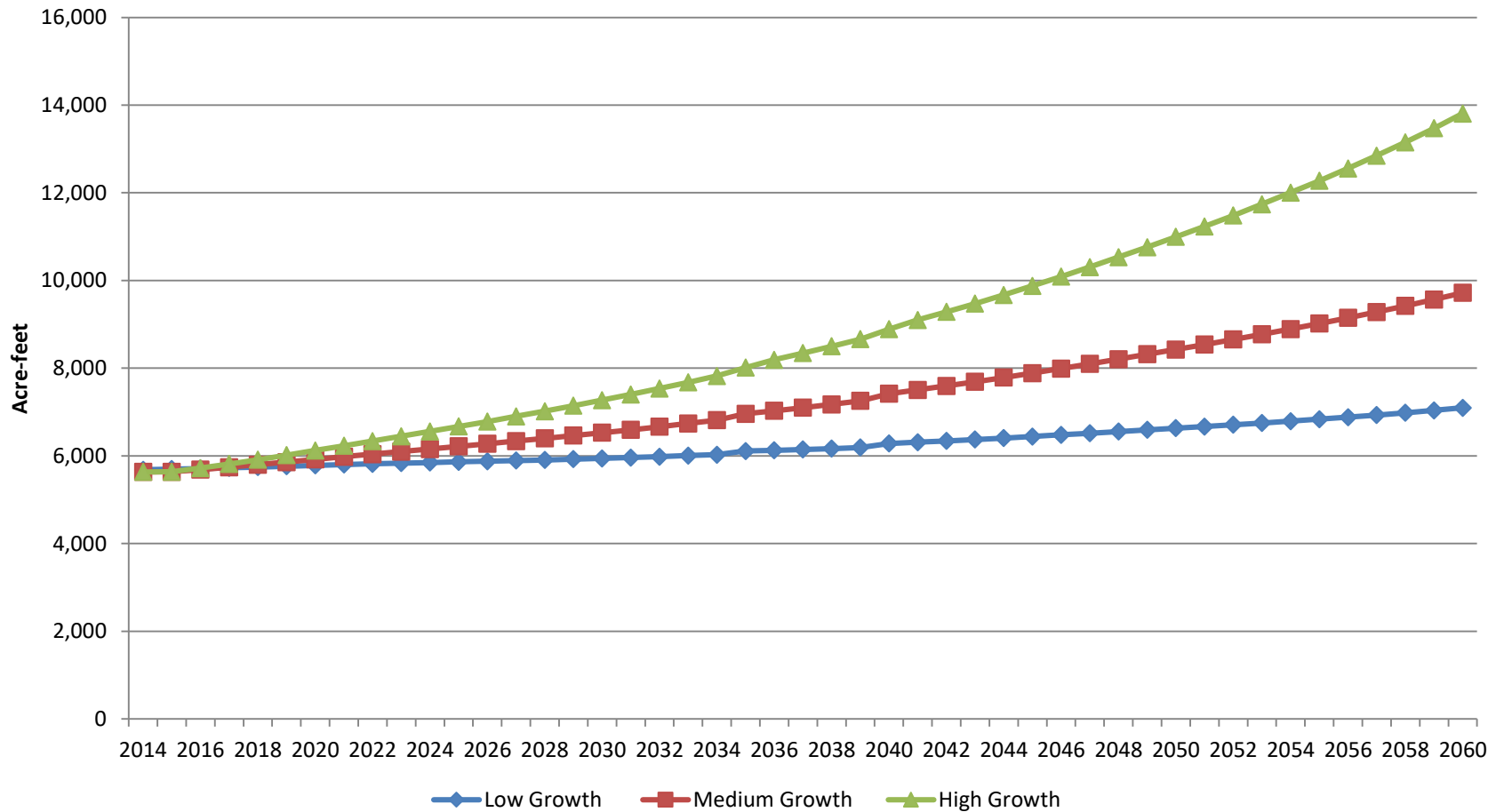
- Scenario I: Business as usual
- Scenario II: Release 5,600 acre-feet to the USACE assuming:
  - a. Hypothetical animal feeding operation with a water demand - 2,000 acre-feet (100 head cattle)
  - b. Hypothetical ethanol plant (1 million gallons per year capacity) with a demand – 4,600 acre-feet
- Scenario III: Release water storage gradually until 2025



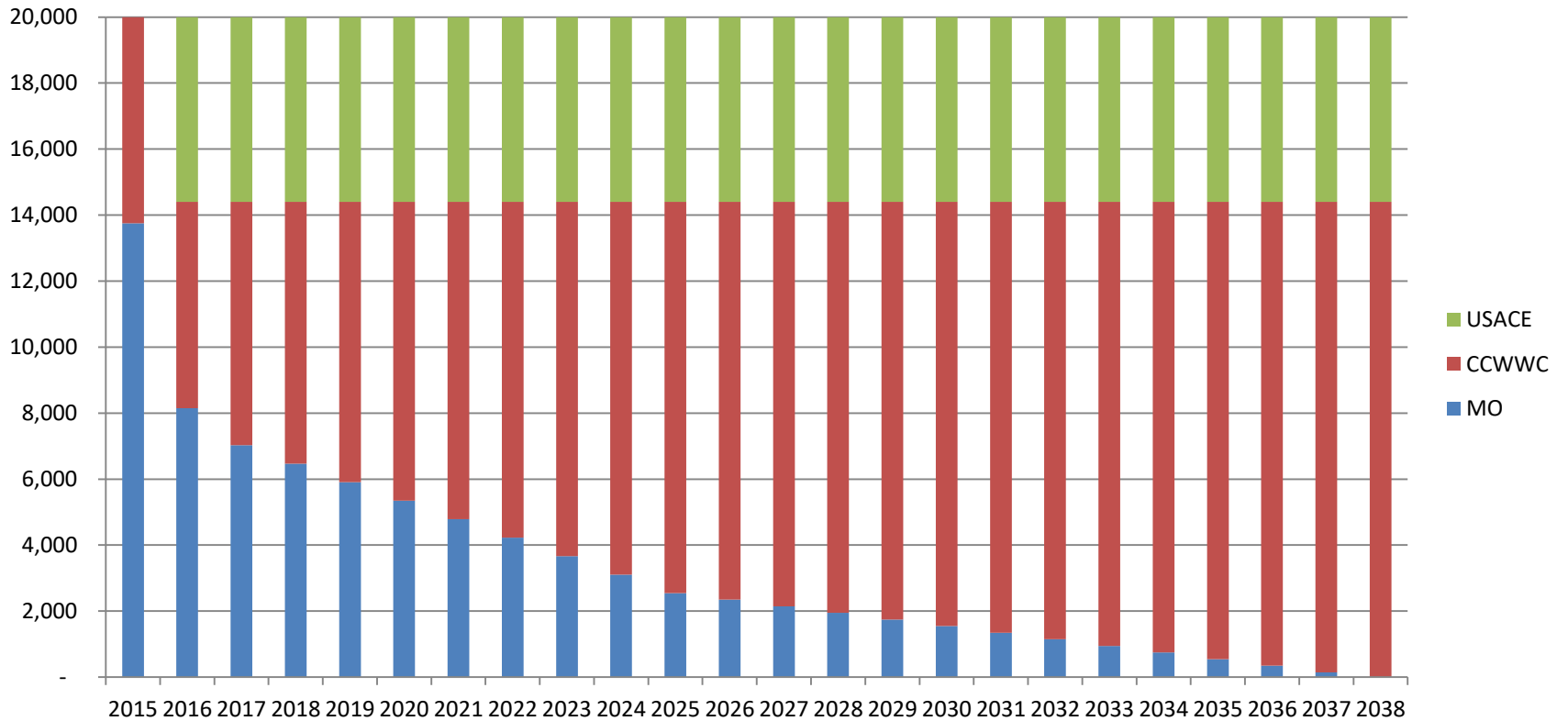
# Clarence Cannon Service Area Population projections



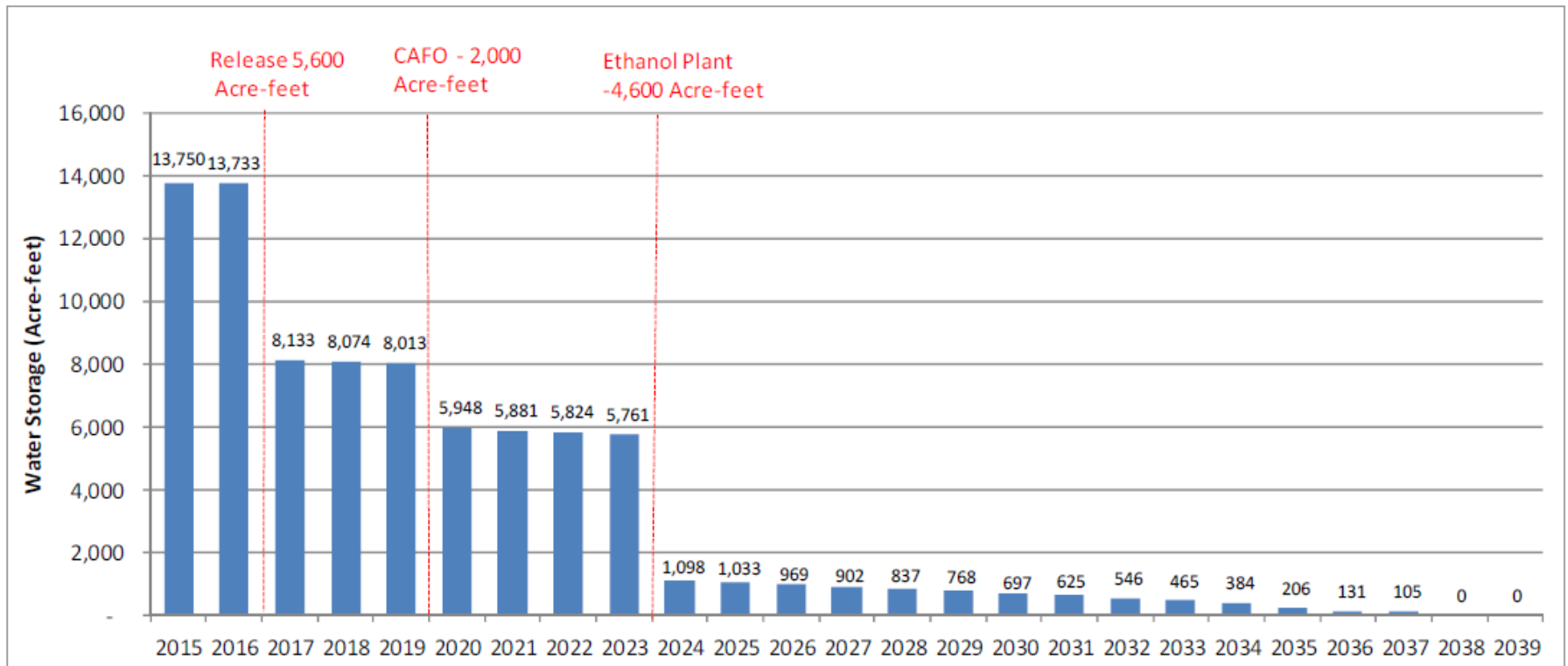
# Water Demand Projections



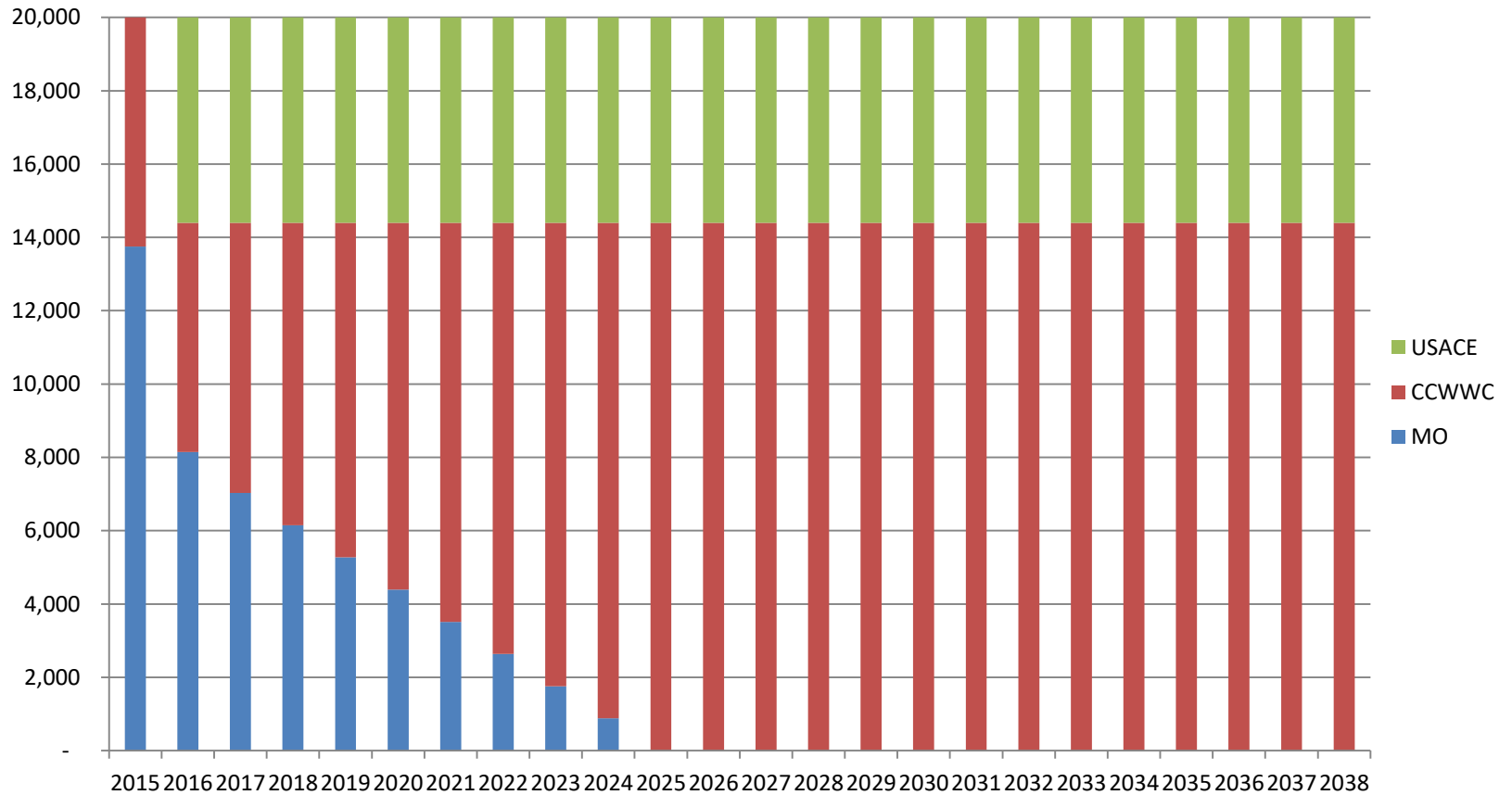
# Scenario II: Hypothetical water demand



# Missouri's water storage 2015-2038



# Scenario III: Gradual release of storage



# Savings

- Scenario I: no savings
- Scenario II: \$10 million savings
  - \$5.5 million savings in interest + O&M
  - \$4.5 million savings in Principal
- Scenario III: \$11.2 million savings
  - \$6.7 million savings in interest + O&M
  - \$4.5 million savings in Principal

# Conclusions

- Missouri chose Scenario II to allow for storage adjustments for unforeseen circumstances and minimizing negative impacts
- 7001 project modification under review
- Savings from this project can potentially be used to support other water supply projects
- Uncertainty about future complicates decision

# Questions?