



Beaver **Water** District

Beaver Lake – Addressing Future Challenges Today

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Environmental Quality Manager

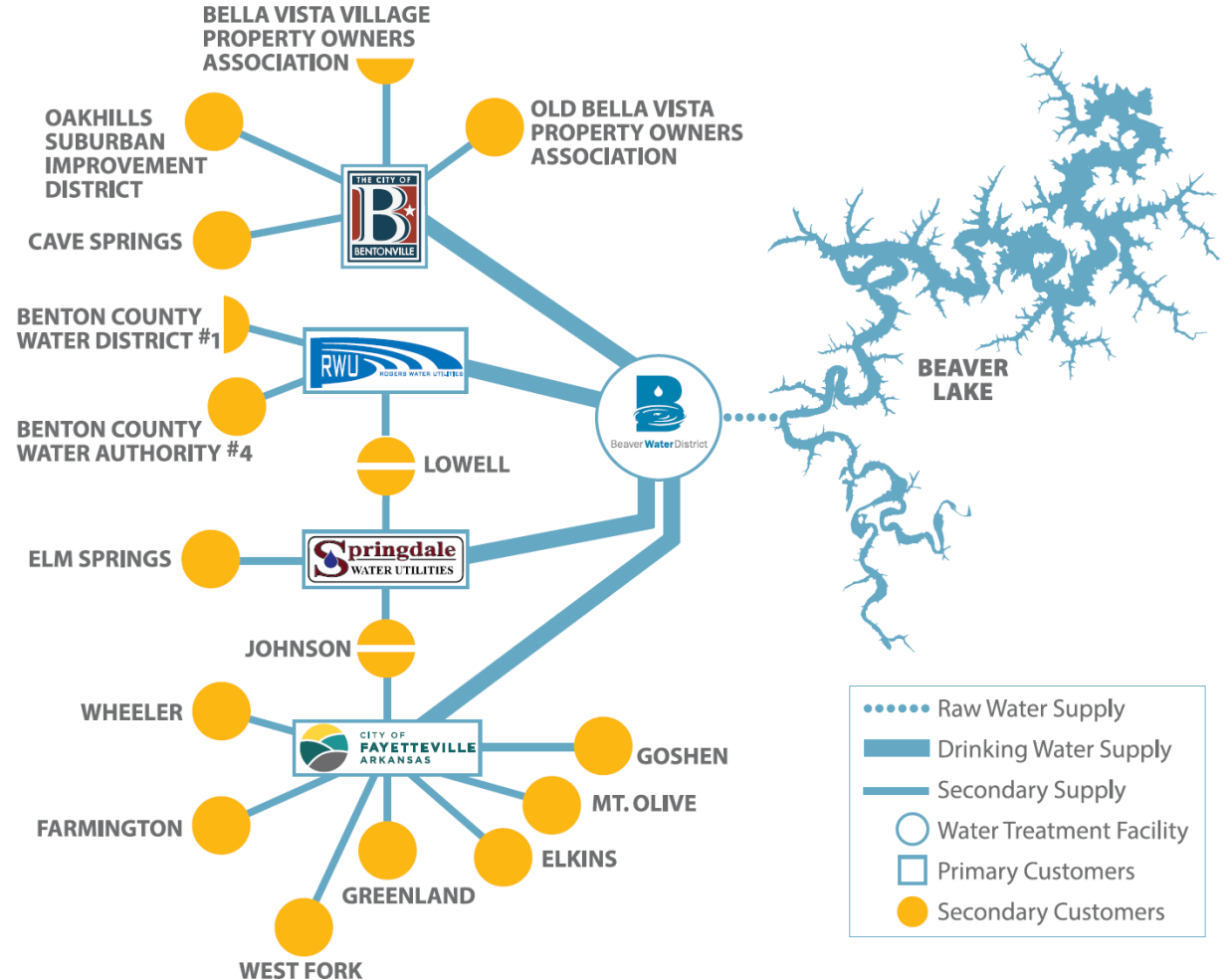


OUTLINE

- Background
- Sediment/Nutrient Loading
- Water Use Allocation
- USACOE Lake Operation Changes

BEAVER WATER DISTRICT

- Conventional Water Treatment Plant
 - 58 MGD average
- Water Wholesaler
 - \$1.39/1000gal
 - ~380,000 people
- Source: Beaver Lake



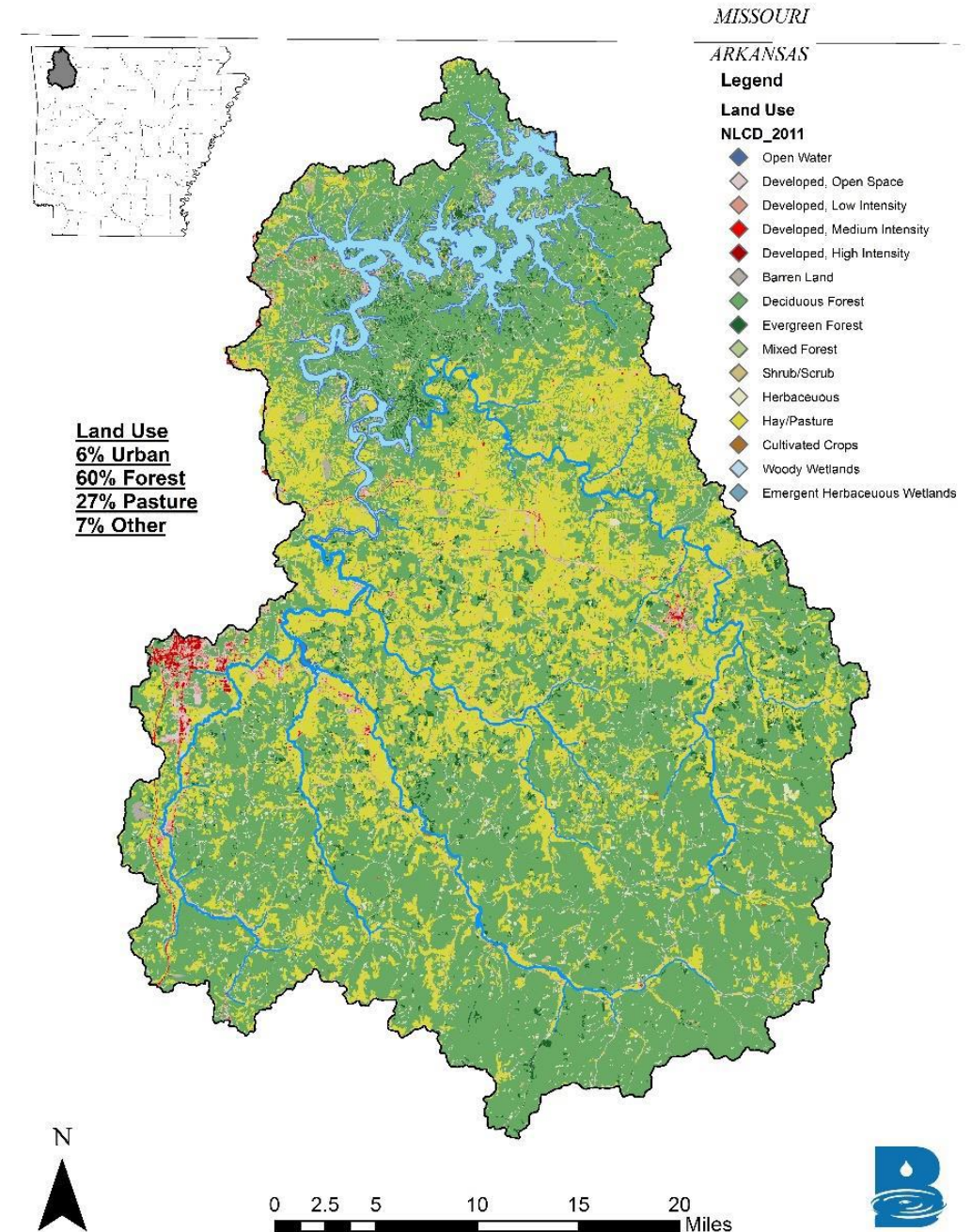
BEAVER LAKE

- 31,500 acre surface
- 449 mi shoreline
- 763,000 acre watershed
- Land Use
 - Forest – 60%
 - Pasture – 27%
 - Urban – 6%



SEDIMENT/NUTRIENT LOADING

- Factors:
 - Agriculture
 - Climate
 - Development
- Impacts:
 - Turbidity
 - Algal Growth
 - Sediment Deposition - Storage Loss
- Solutions:
 - Source Water Protection Program



Raw Water Turbidity

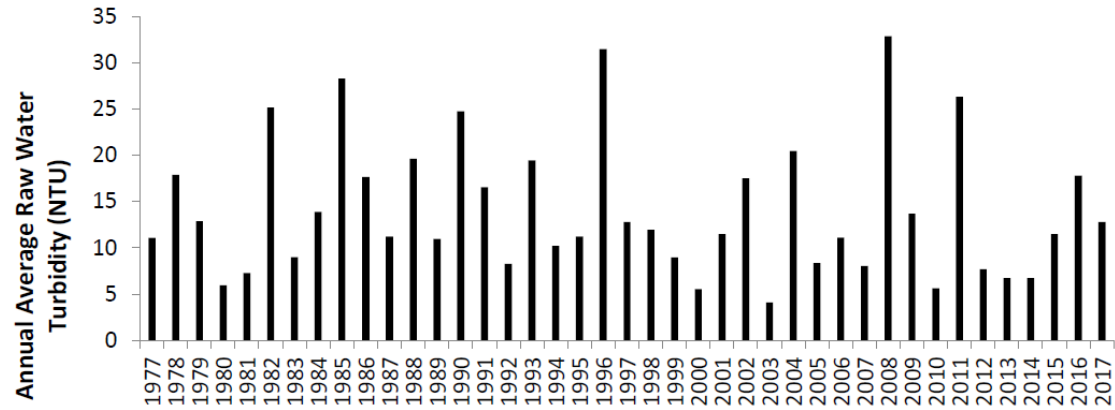


Figure 7. Annual average raw water intake turbidity at the Beaver Water District intake for the period from 1977 – 2017, NTU

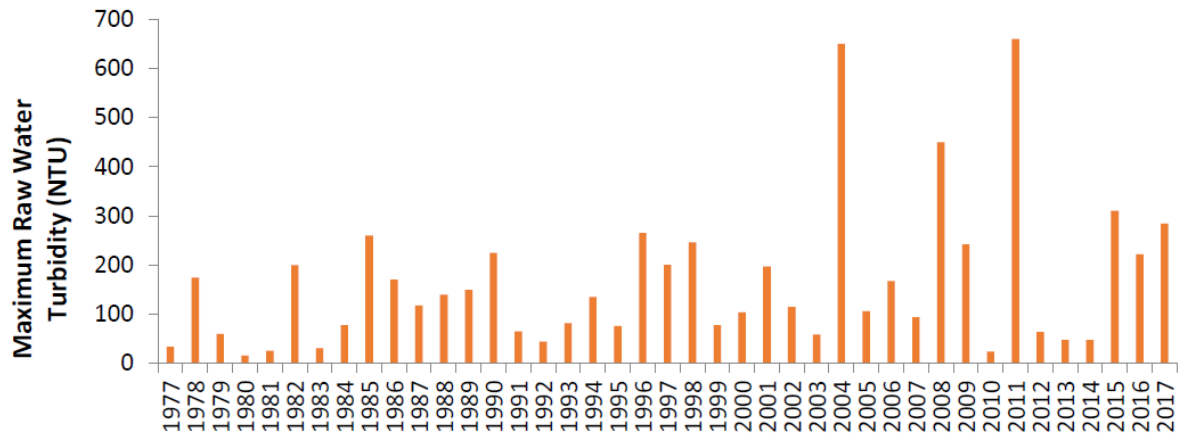


Figure 8. Annual maximum raw water intake turbidity at the Beaver Water District intake for the period from 1977 – 2017, NTU

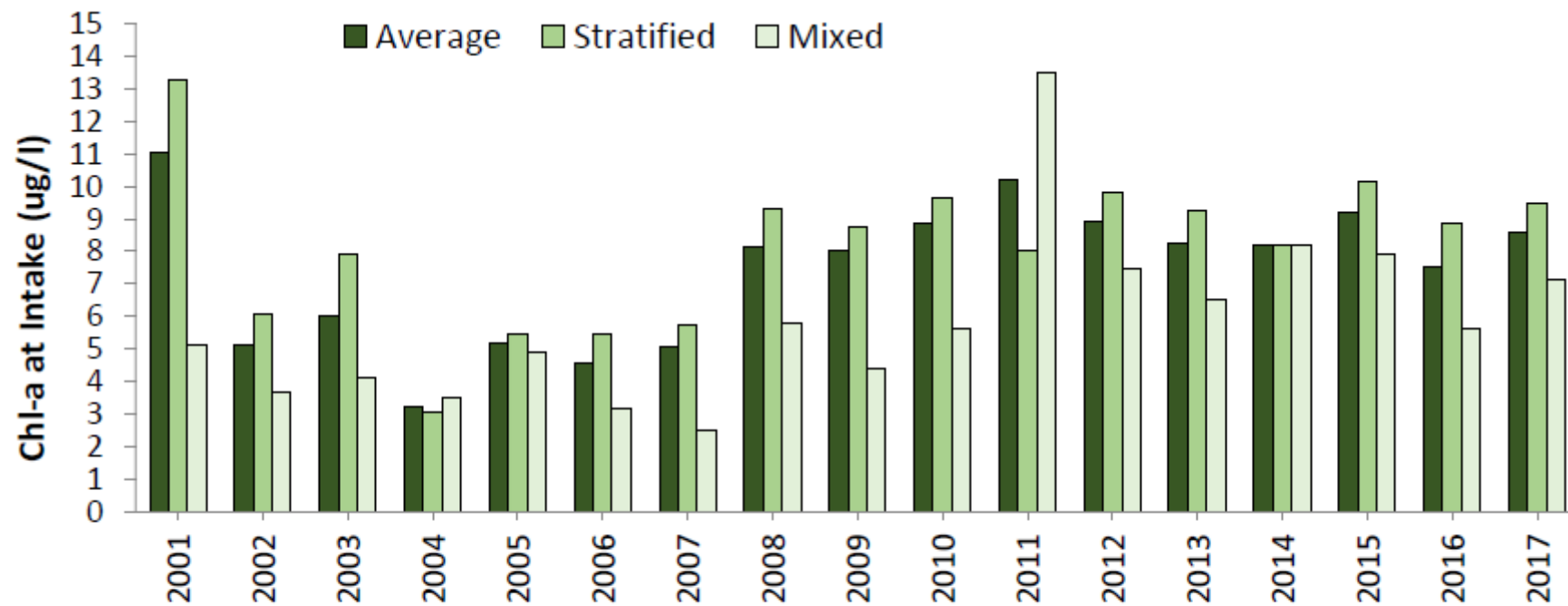
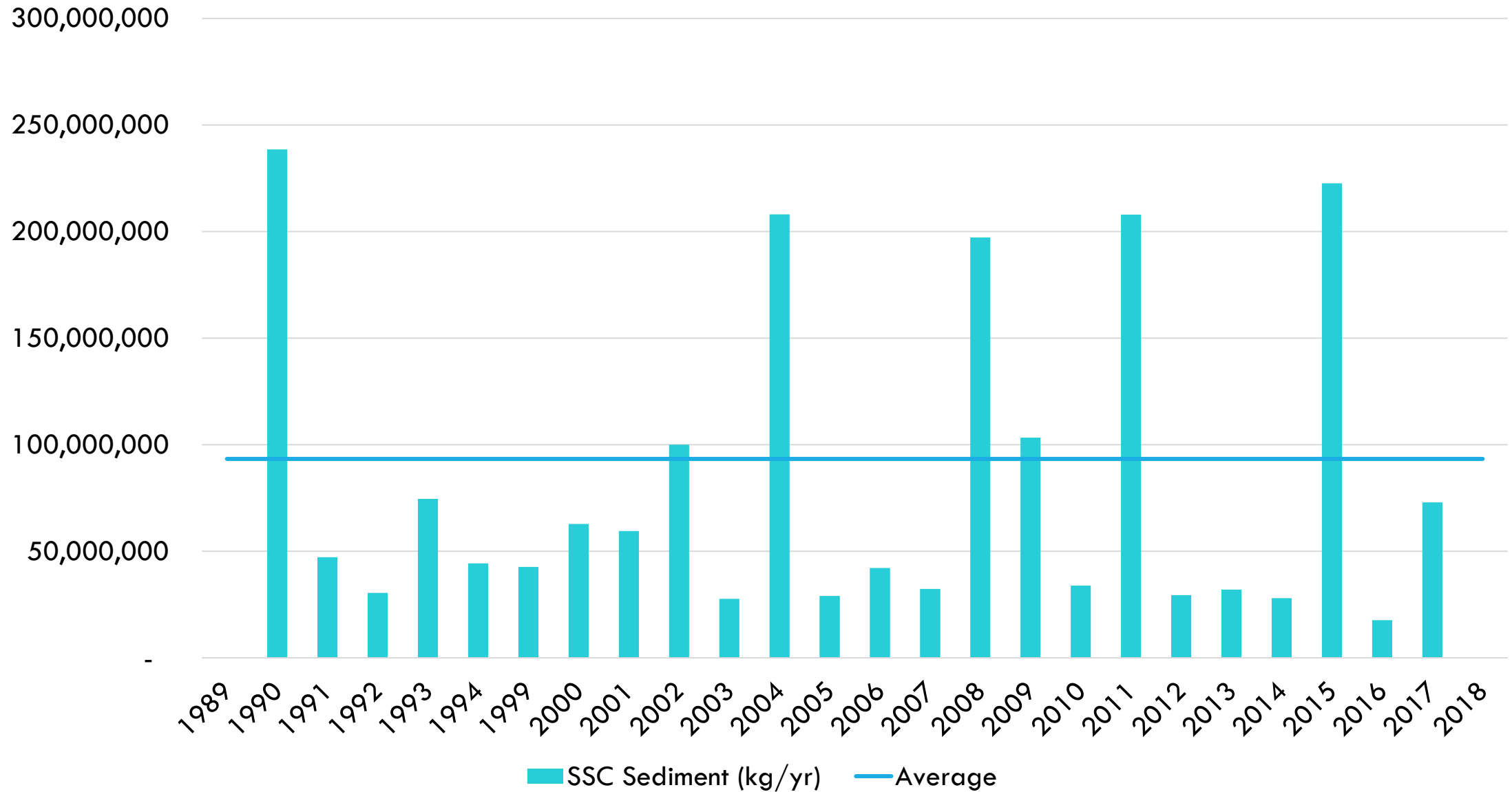


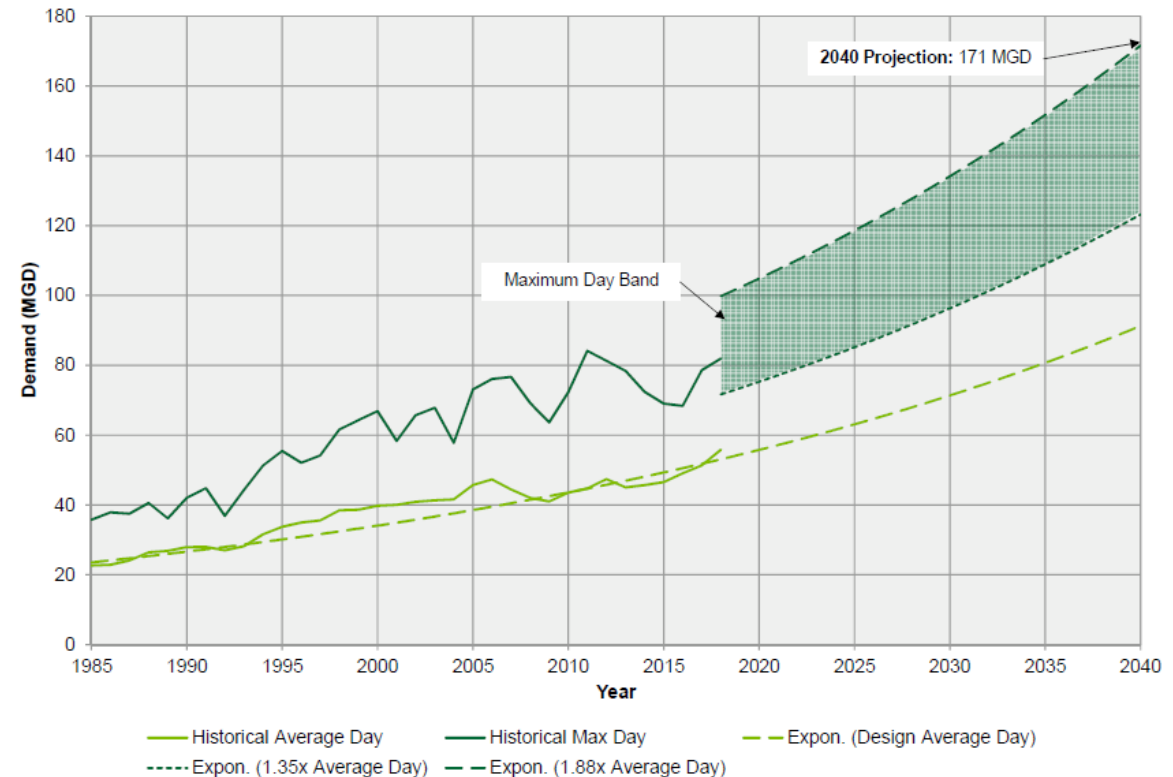
Figure 12. Mean epilimnetic chlorophyll-a on Beaver Lake near the intake broken down as annual average, average during stratification (typical of growing season), and average during mixis

White River Gage Sediment Loads



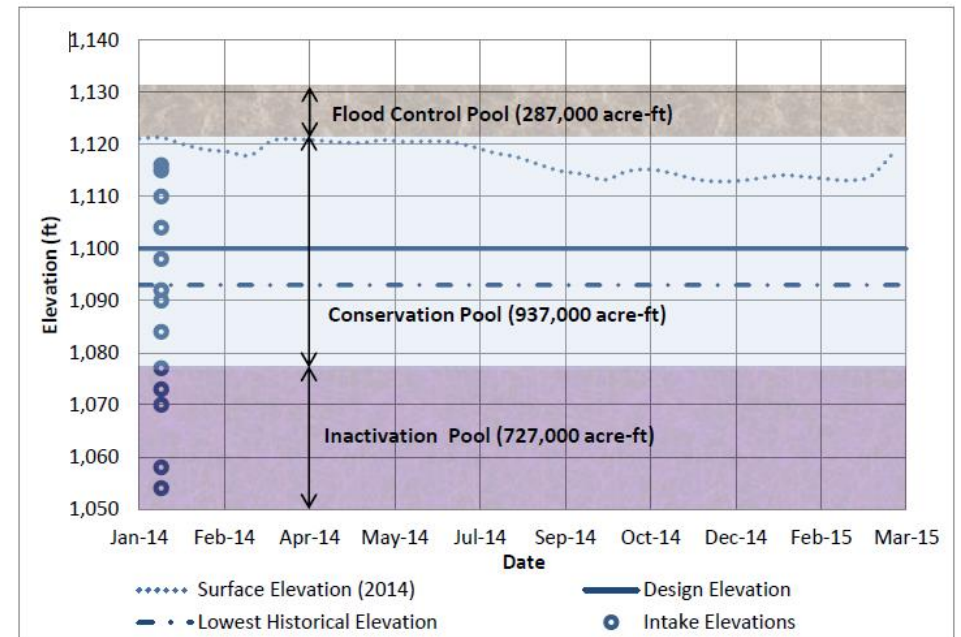
DRINKING WATER ALLOCATION

- Factors:
 - Regional Growth
 - 137,000 acre-ft/120 MGD
 - No Unclaimed Storage – includes all water providers on lake
- Impacts:
 - Future viability
- Solutions:
 - Winners and Losers
 - Act of Congress

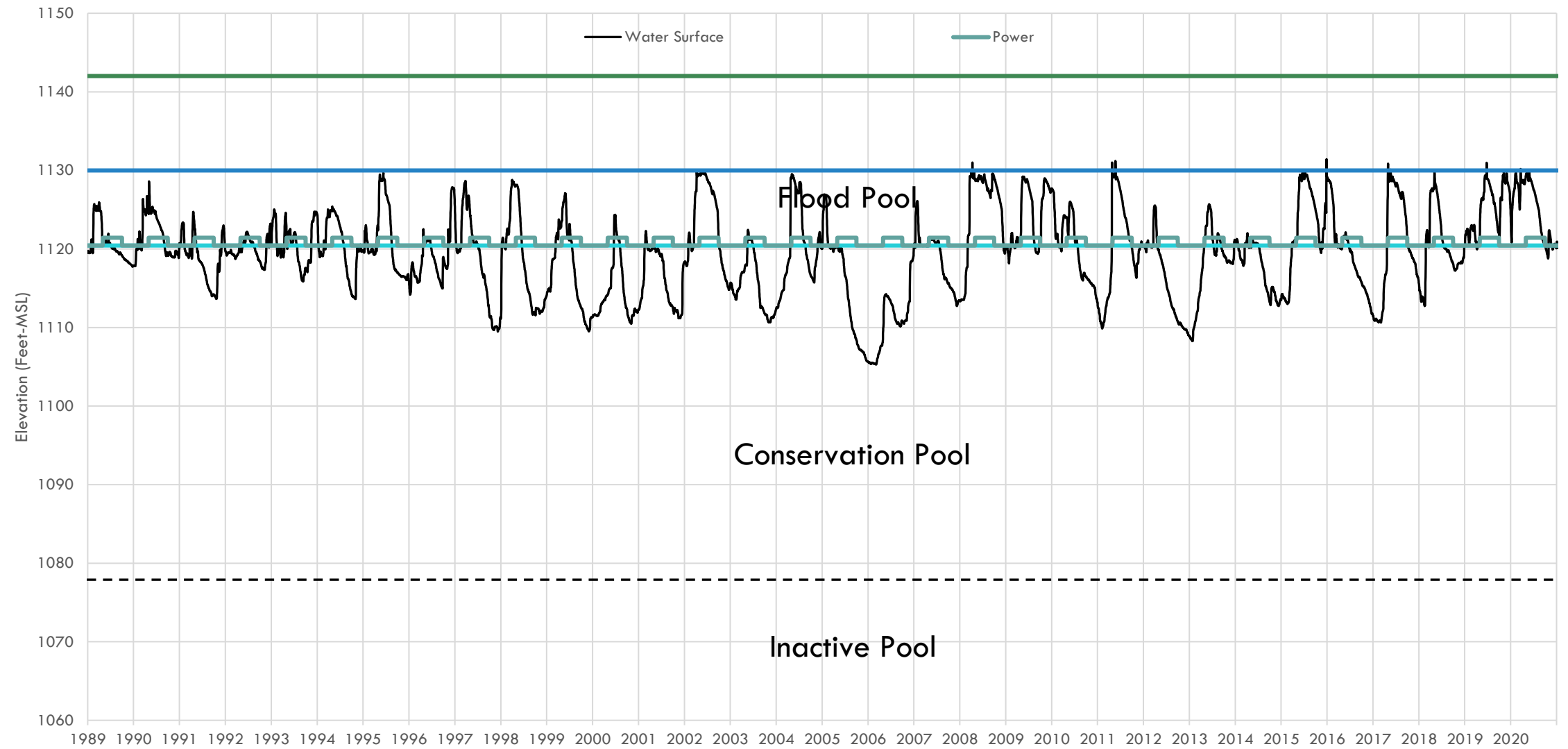


USACOE LAKE OPERATION CHANGES

- Factors:
 - Climate Change
 - Downstream Risk Reduction
- Impacts:
 - Residence Time – may benefit us by slowing down major turbidity events – no emergency spillway releases
 - Water Storage – decreased firm yield, less “free” water
 - Shoreline Erosion
- Solutions: ?

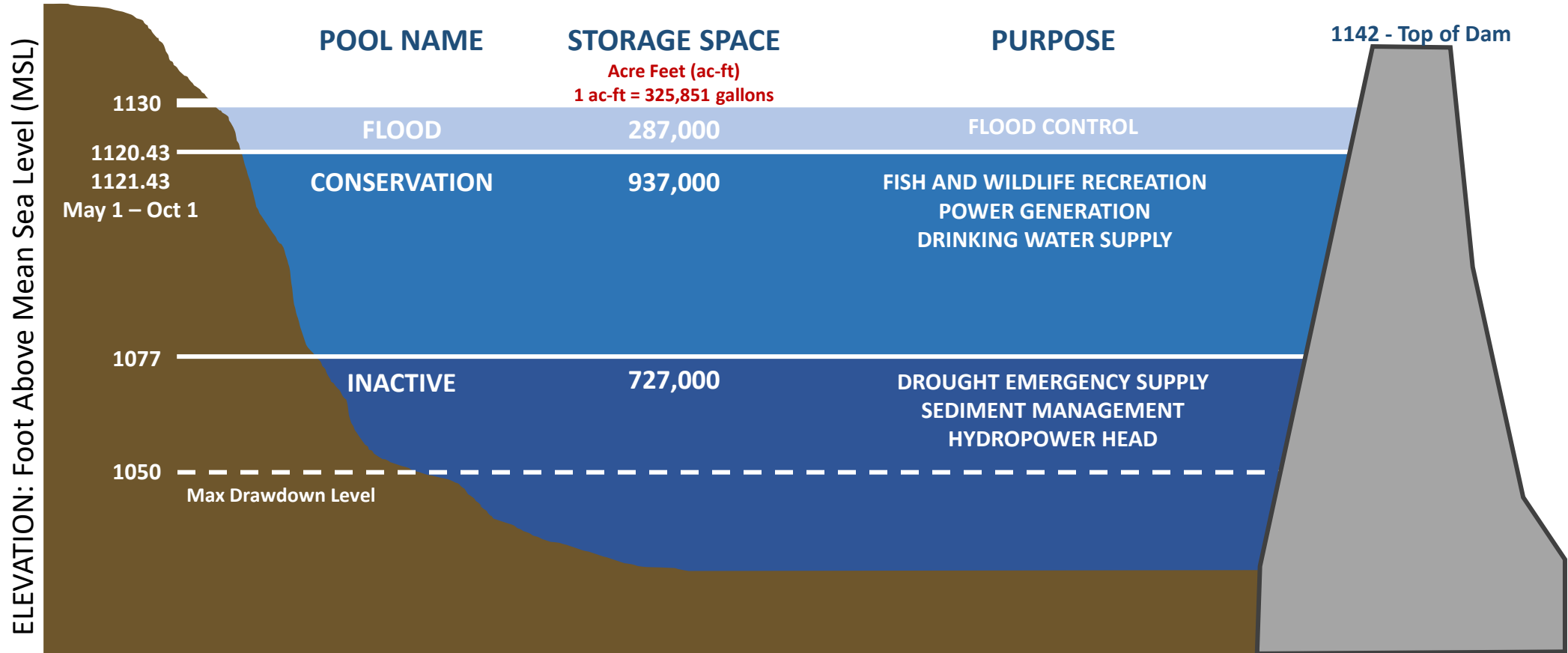


Beaver Lake Pool Elevation



BEAVER LAKE

Multipurpose Water Storage Reservoir



QUESTIONS?