

Tree Ring Reconstruction

Applications in Water Management Planning

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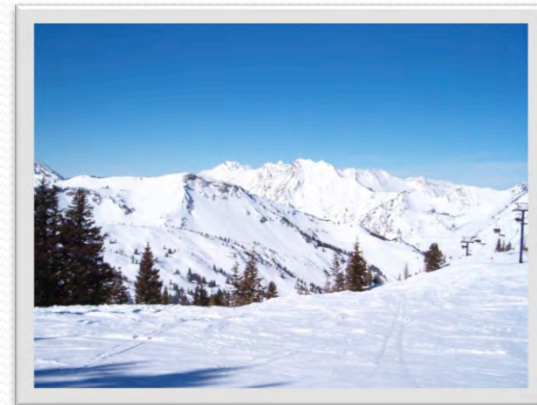
Outline

1. Background
2. Salt Lake City's Water Supply Sources
3. Climate Modeling
4. Application of Tree Ring Data

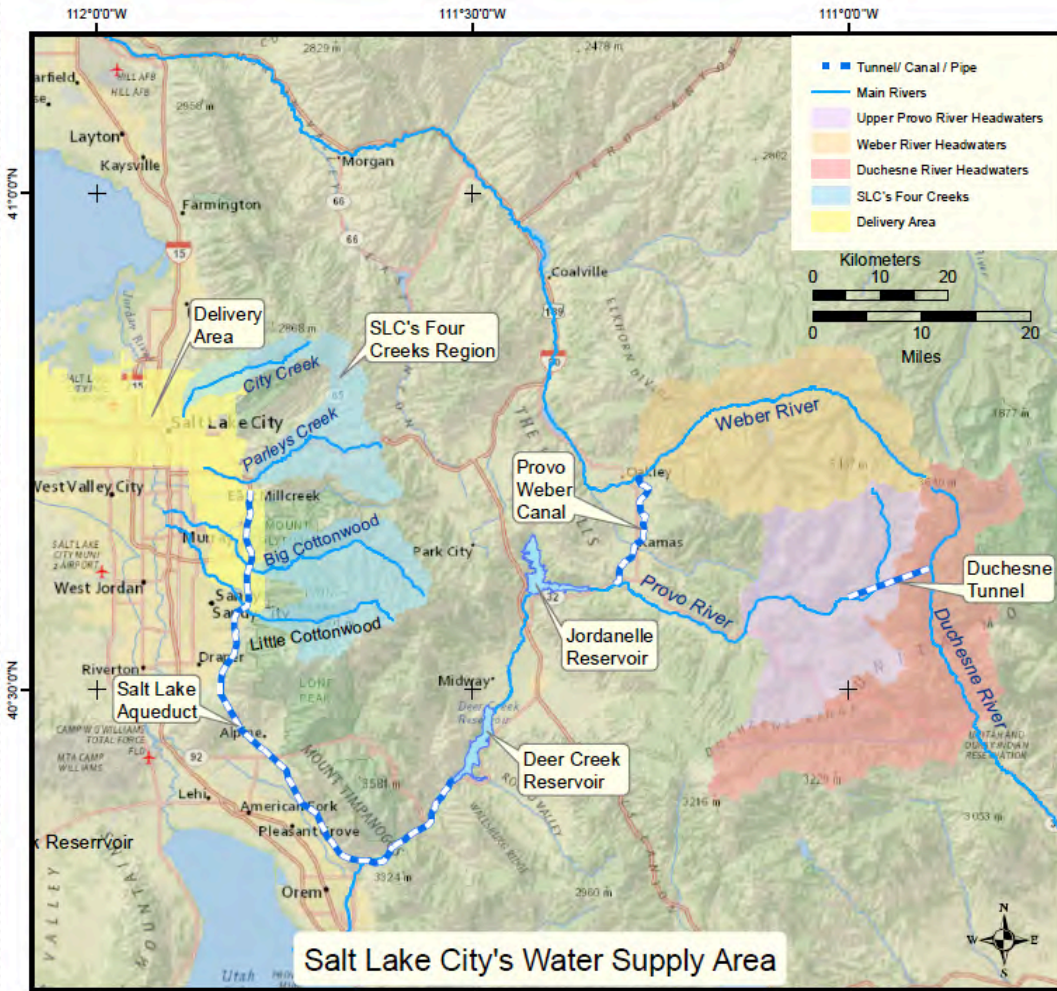


Salt Lake City Public Utilities

- Public water supplier for more than 340,000 people (and growing)
- Surface water is majority of water supply(85-90%)
- Distribution of water
- Stormwater
- Sewer

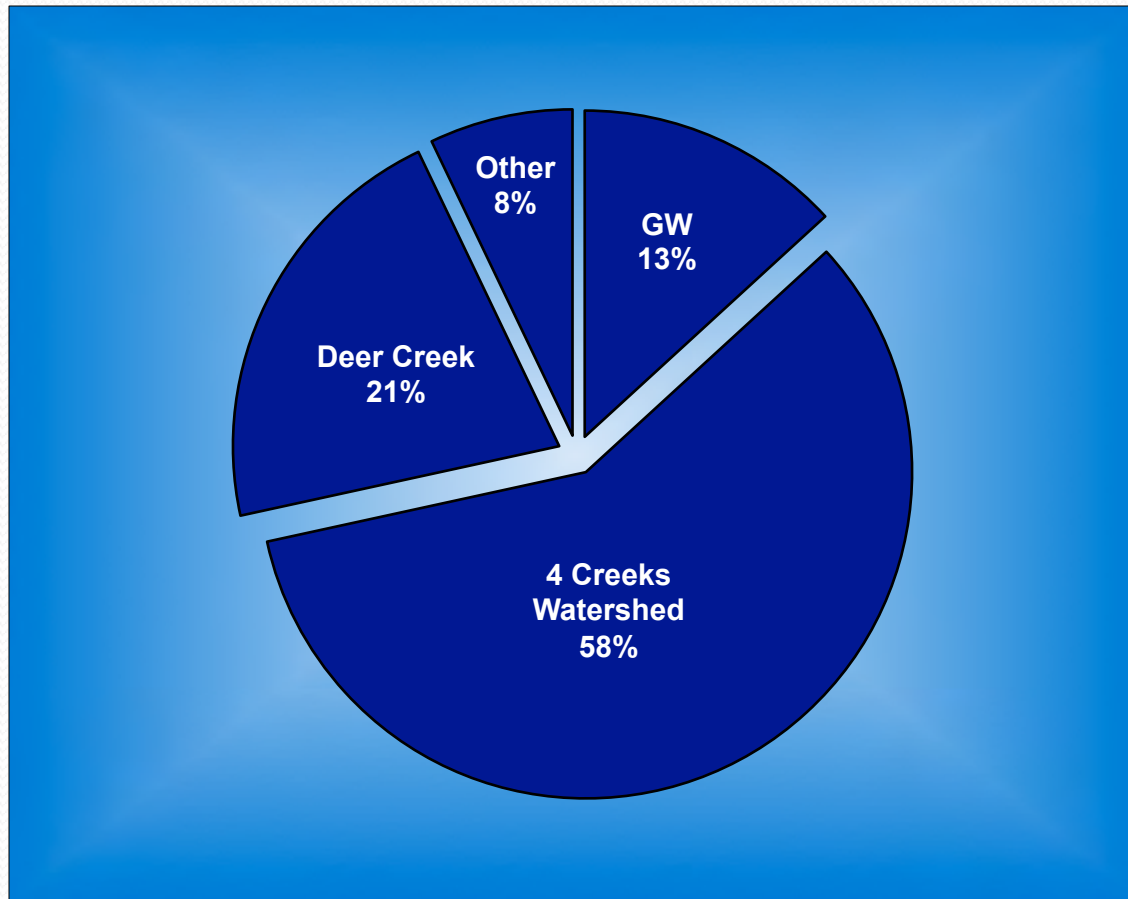


Salt Lake City's Water System



- 4 Creeks Watershed
 - City Creek
 - Parley's Creek
 - Big Cottonwood Cr
 - Little Cottonwood Cr
- Deer Creek
 - Provo Drainage
- Central Utah Project
 - Additional Reservoirs

Sources by Type



Translating New Info into Local Action

- Better understanding of SLC's water resources vulnerabilities.
- Regional and utility specific climate sensitivity and vulnerability analyses.
- Establish partnerships with research community and other networks: Western Water Assessment, CBRFC, Utah State, University of Utah, U of Arizona-Lab of Tree Ring Research, NOAA, and many others



Proactive Approach



- Salt Lake City is taking a proactive approach in understanding impacts that climate change will have on our water supply
- SLC needs to understand the past variability-
 - Currently (last 100 year or so) we have been living in a relatively wet time period
 - Using the tree ring data, we hope to gain an understanding of the variability of the past climate



Variety of Tools

- System Observations
- Climate Modeling
- Tree ring research

Water System Observations

- “Baseline” conditions & sensitivity analysis
 - Increasing temperatures and precipitation results in:
 - Changes the volume and runoff timing
 - If runoff is earlier in season, dry years will have difficulty meeting demands
 - In a scenario of “normal water year”, but without Deer Creek, meeting demand would be challenging
 - In the case of a more dry and warmer water year, meeting demand would be extremely difficult



Climate Model Process

- Climate models and observed trends
- Watersheds runoff sensitivity to temperature and precipitation changes (Hydrologic Model)
- Water Supply Scenario development
- Evaluate past and future water demand
- Choosing climate model scenarios
- Parleys Creek Pilot
- Iteration

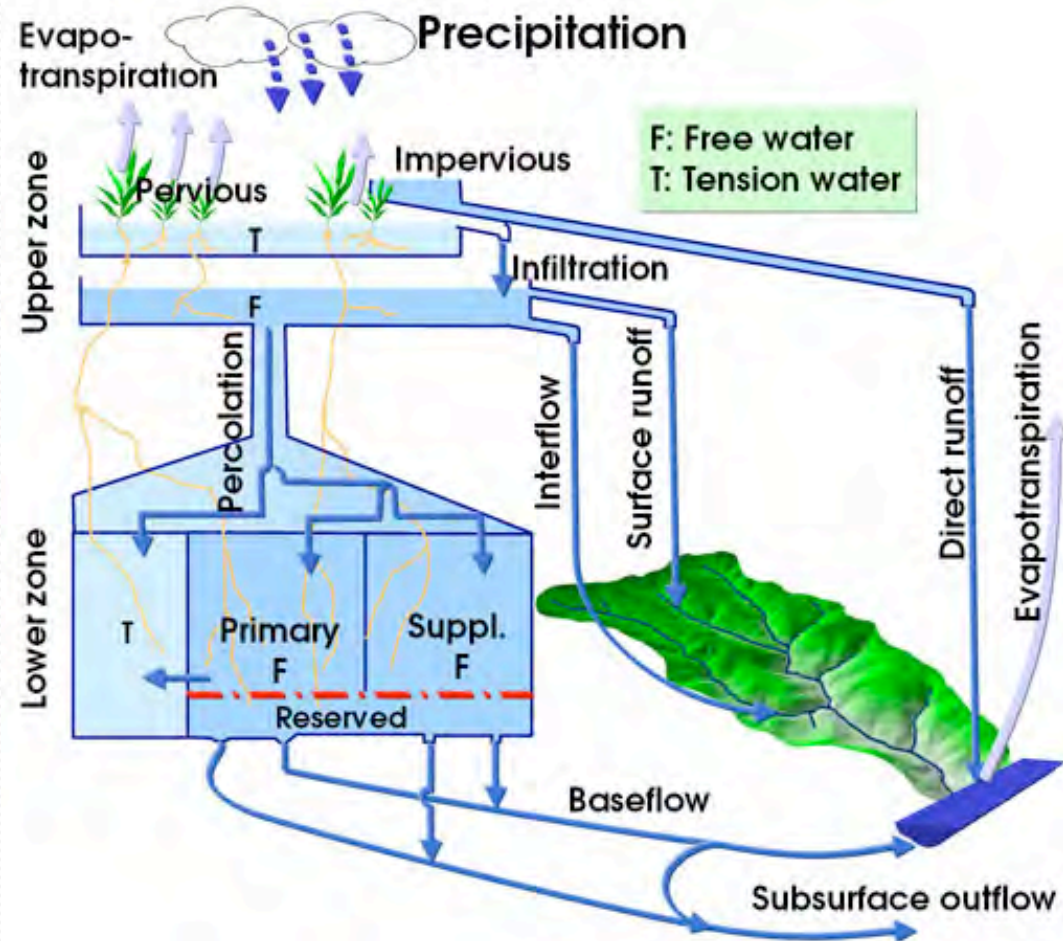


Runoff Sensitivity/ CBRFC Watershed Models

Snow Model: SNOW-17
Temperature Index Snow model

RFCs use a snow model and a rainfall-runoff model:

- SNOW-17: Temperature index model for simulating snowpack accumulation and melt
- Sacramento Soil Moisture Accounting Model: Conceptual hydrologic model used to generate runoff



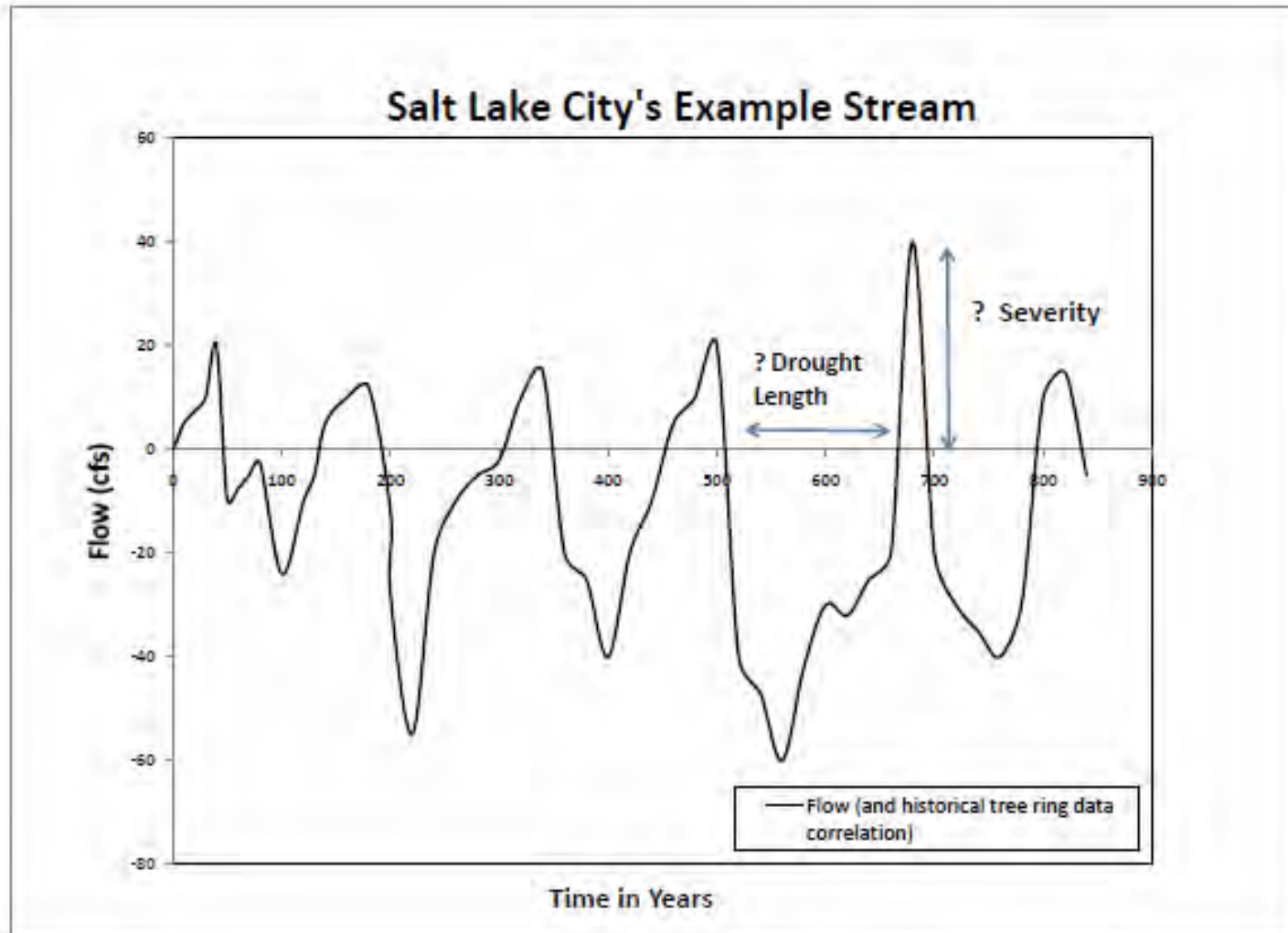
Tree Ring Reconstruction



- Salt Lake City may be able to use this as another data tool
- Tree ring reconstruction research may confirm and expand previous findings with regard to drought and floods.
- Is there evidence in the tree ring data showing:
 - Length of drought
 - 5, 10, 100 years?
 - Severity of drought

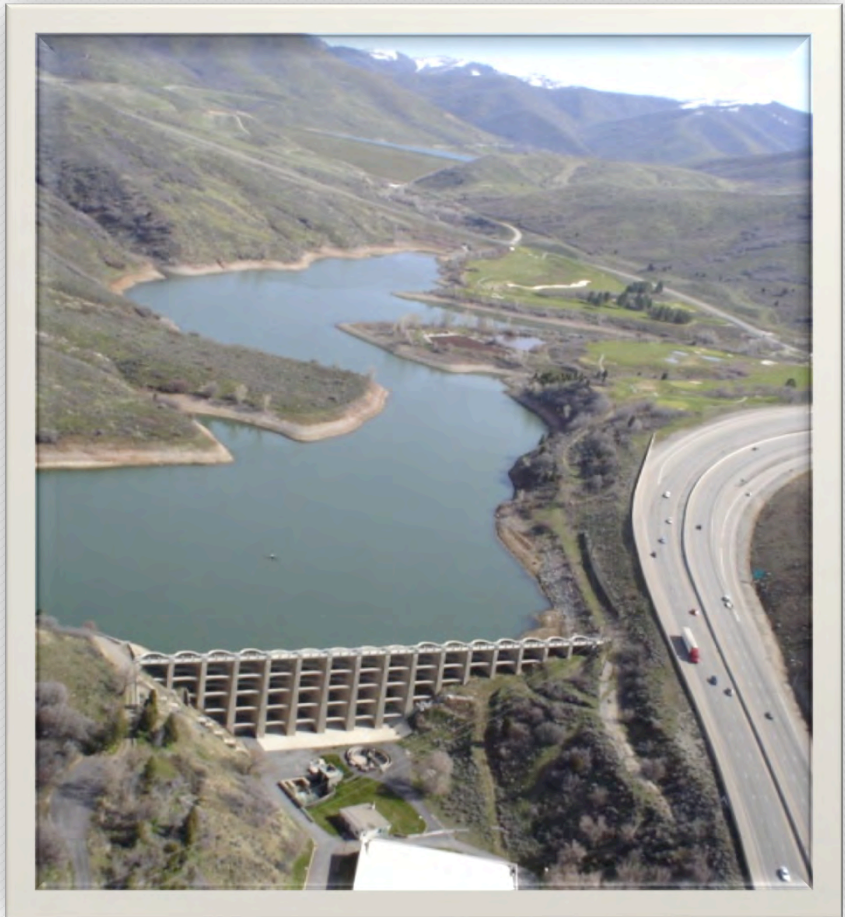


Tree Ring Research



Future Planning

- Aquifer recharge and storage
- Increase water conservation
- Water Reuse
- Water Storage
- Investment in natural resources
- Other Water Sources



Questions?



Silver Lake, Big Cottonwood Canyon