Assessing Climate-Related Risk and Adaptation Options for Water Suppliers along the Oregon Coast

Mid-Coast Water Planning Partnership

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Where do we fit into the Water Action Plan?

Imperative 4. Water Conservation, Efficiency, and Reuse: **Action 27**

and

Imperative 7. Planning for Water Supply Development Needs (including assessment): **Action 43**

Action (27 and 43) - Pre-Pandemic

Using the Water Management Economic Assessment Model, develop a suite of adaptation measures (e.g., storage investments, conservation rebate programs, and new pricing models) to address existing and predicted water shortages in the region.

Desired outcomes from Action 27 & 43 as stated in Plan still pertinent:

- Updated analysis of supply and demand coupled with an alternatives analysis of potential strategies to reduce demand and/or increase supply (conservation, pricing, storage, reuse, etc.).
- Watershed Management Plans are developed that incorporate water source strategies.
- Document updated supply and demand projections for individual users and the region as a whole, including an analysis of alternatives and costs/benefits to meet current and **future needs**.

Desired outcomes from our project (post-pandemic):

- Estimate climate change impacts on long-term water demand
- Estimate climate change impacts of long-term water supply
- Evaluate future reliability of water supply systems and instream protection
- Explore alternatives to meet future water needs

Exploring alternatives to meet future water needs

Over the next several decades, how often might…

- curtailment stages be triggered?
- municipal water rights be exhausted?
- instream water rights not be met?
- municipal water supply be insufficient to meet demand?

Climate change effects on water demand

Steps:

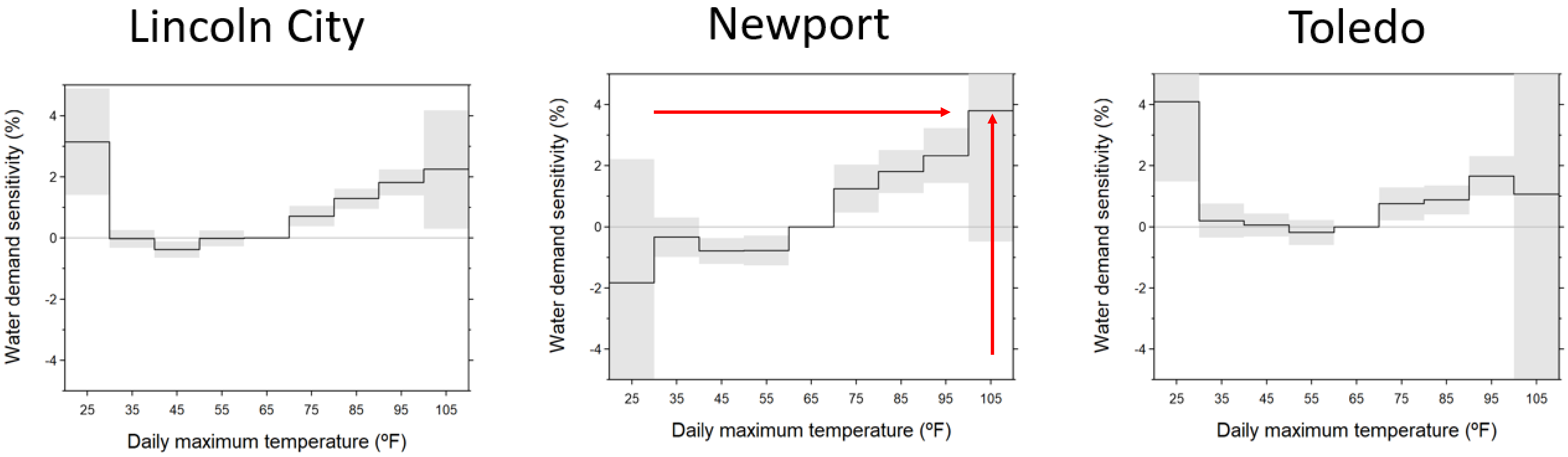
1) Estimate sensitivity of municipal water demand to weather variables (temperature, precipitation) using historical records

2) Obtain scenarios of the future climate

3) From 1) and 2), estimate future changes in water demand due to change in climate

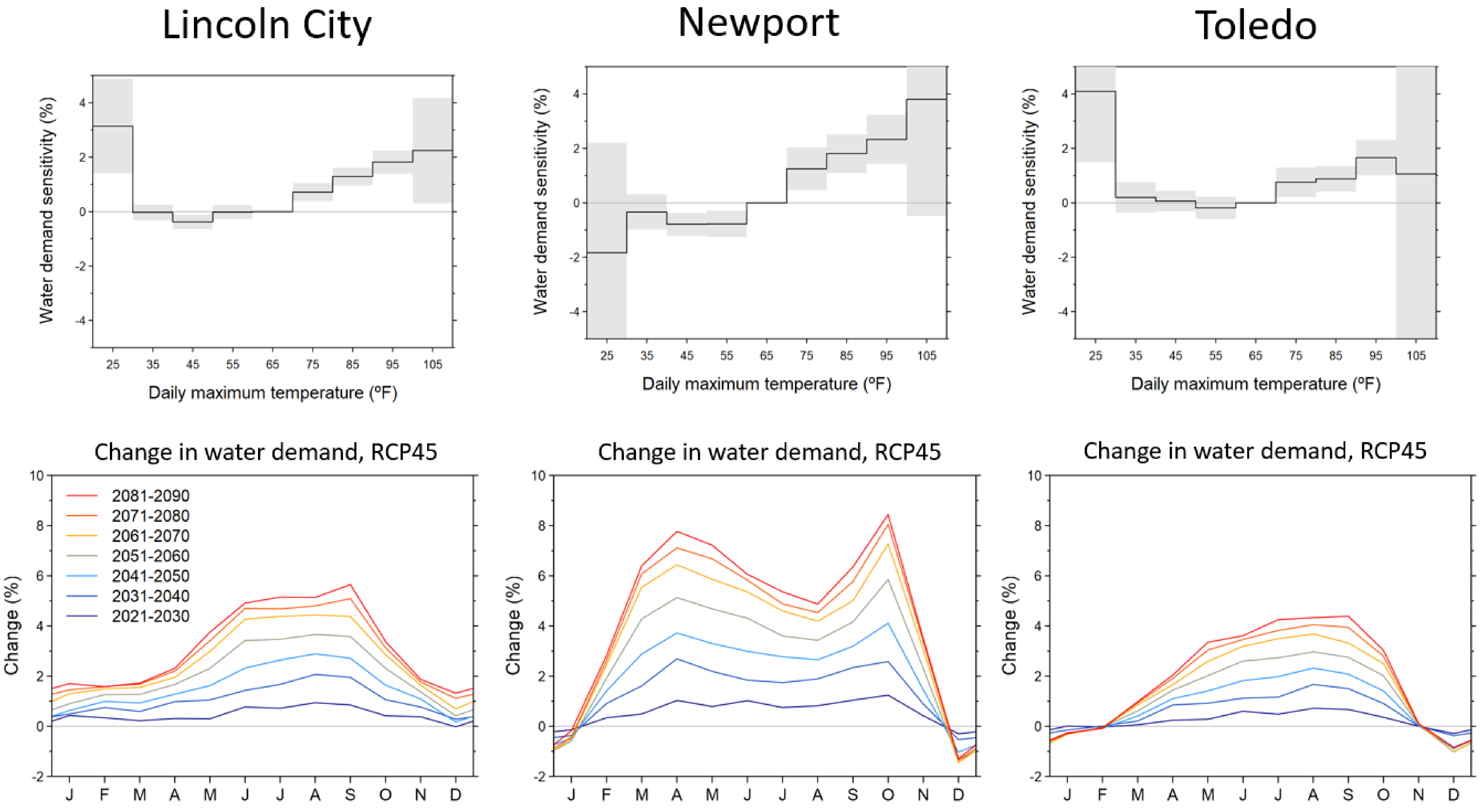
Climate change effects on water demand

Monthly water demand increases most during hot days in the Willamette Valley



Example: For each day in a month that the Willamette Valley exceeds 100°F, Newport monthly water demand increases by 4%

Climate change effects on water demand



Climate change effects on water supply

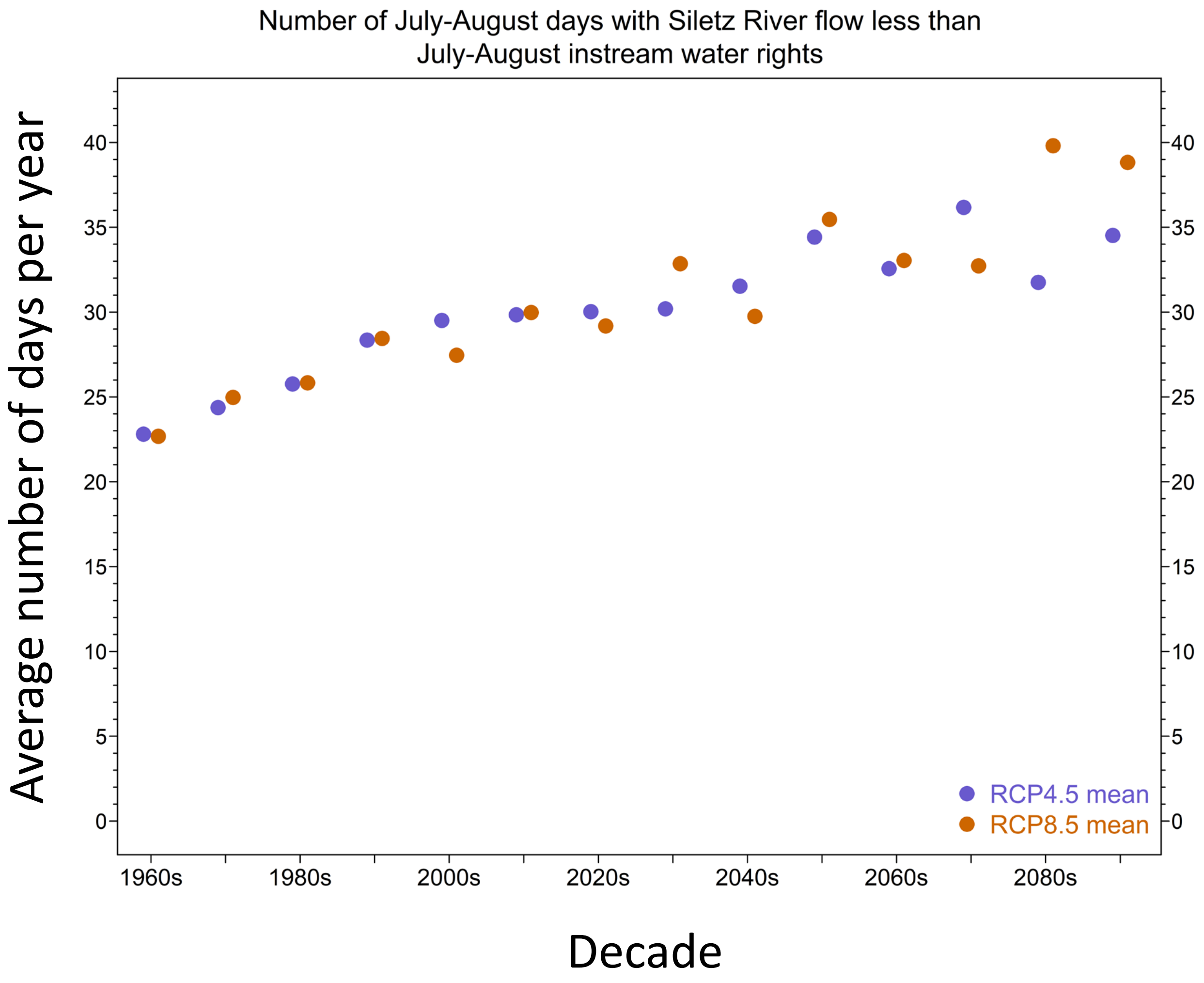
Steps:

1) Obtain projections of future streamflow under different climate scenarios (to date, only Siletz River)
2) Calculate how often in the future streamflow falls below thresholds of interest.

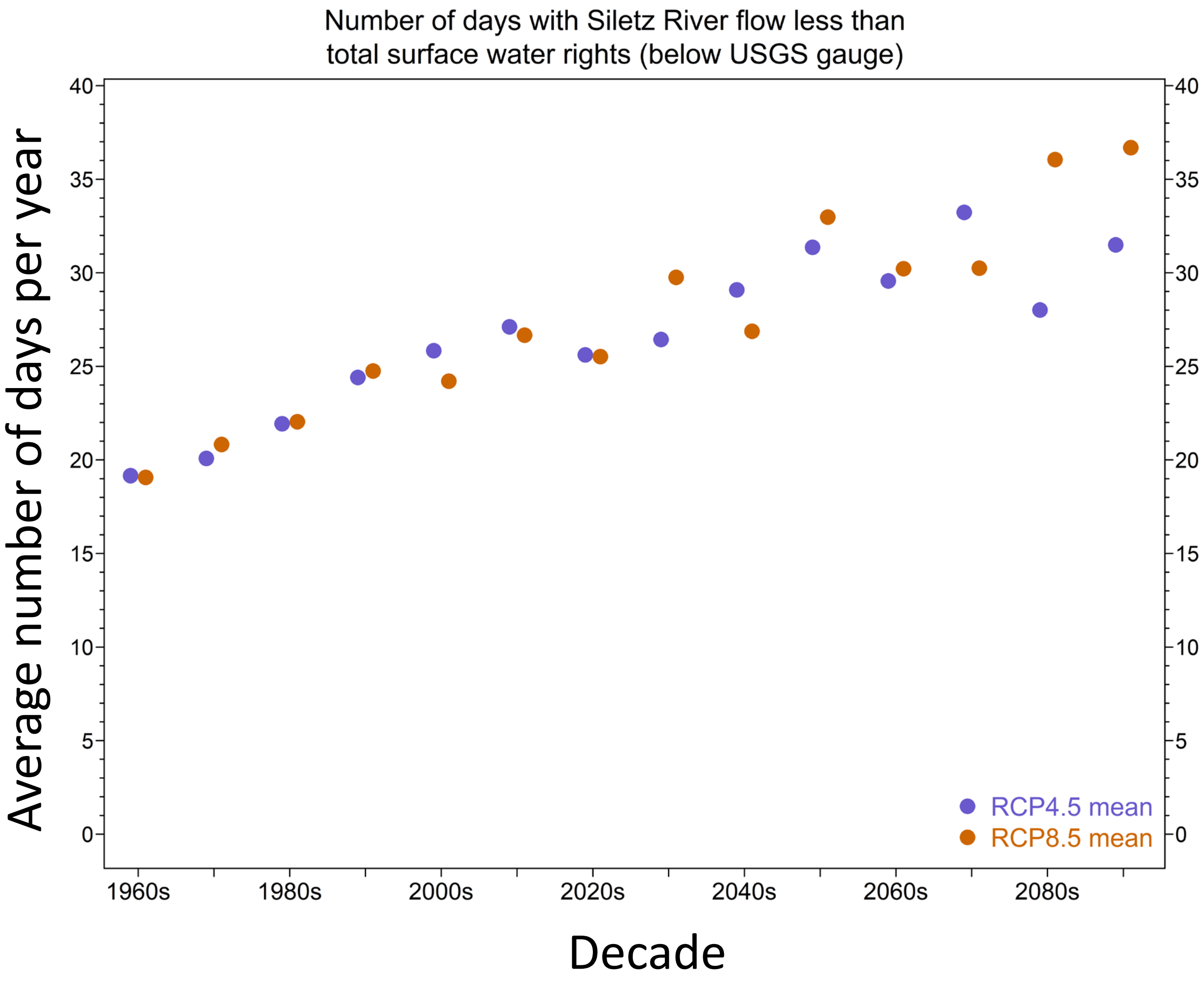
Climate change effects on water supply

How often do water rights exceed supply?

Flow less than in-stream water rights



Flow less than total surface water rights



Climate change effects on water system reliability (Newport example)

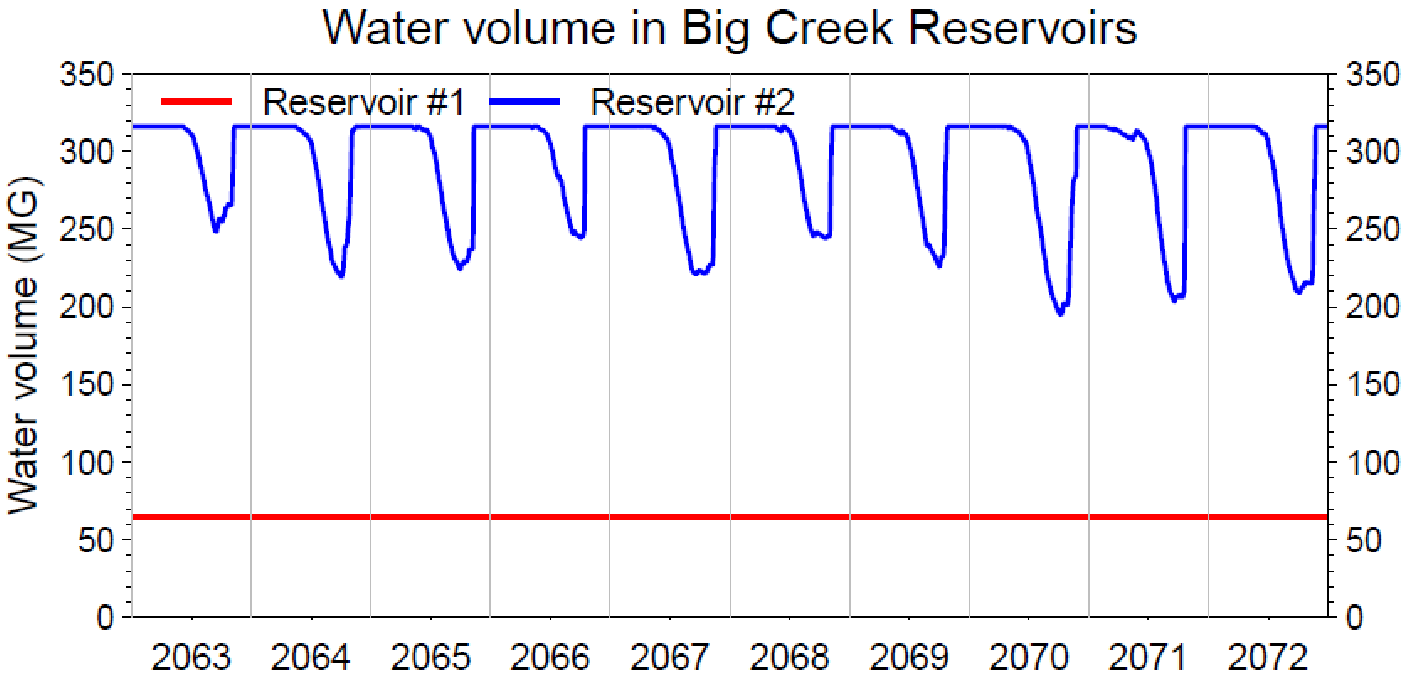
Steps:

1) Develop a ‘simple’ of a municipal water system
2) Simulate future daily demand and supply (considering population growth and climate impacts)
3) Model ability to meet future demand under different water management alternatives

Alternative 1:

Maximize water rights to keep reservoirs full

Plentiful storage in reservoirs all year



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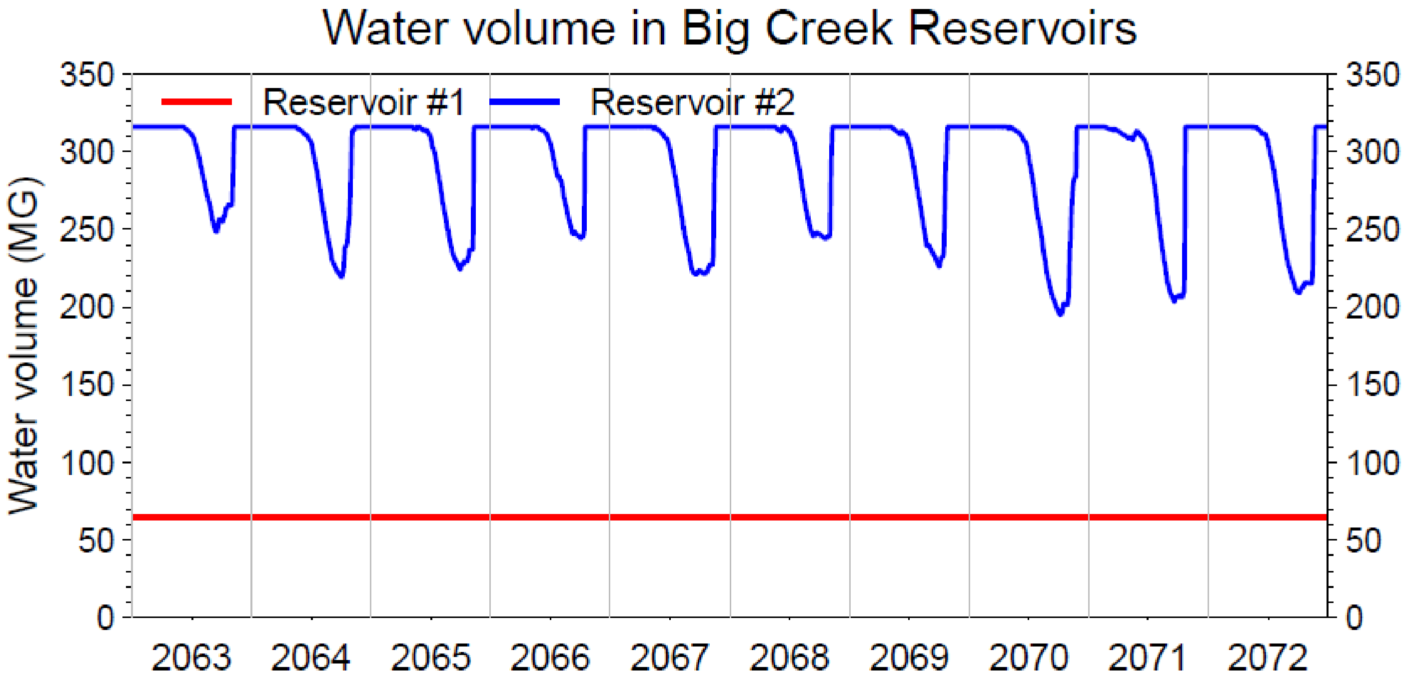
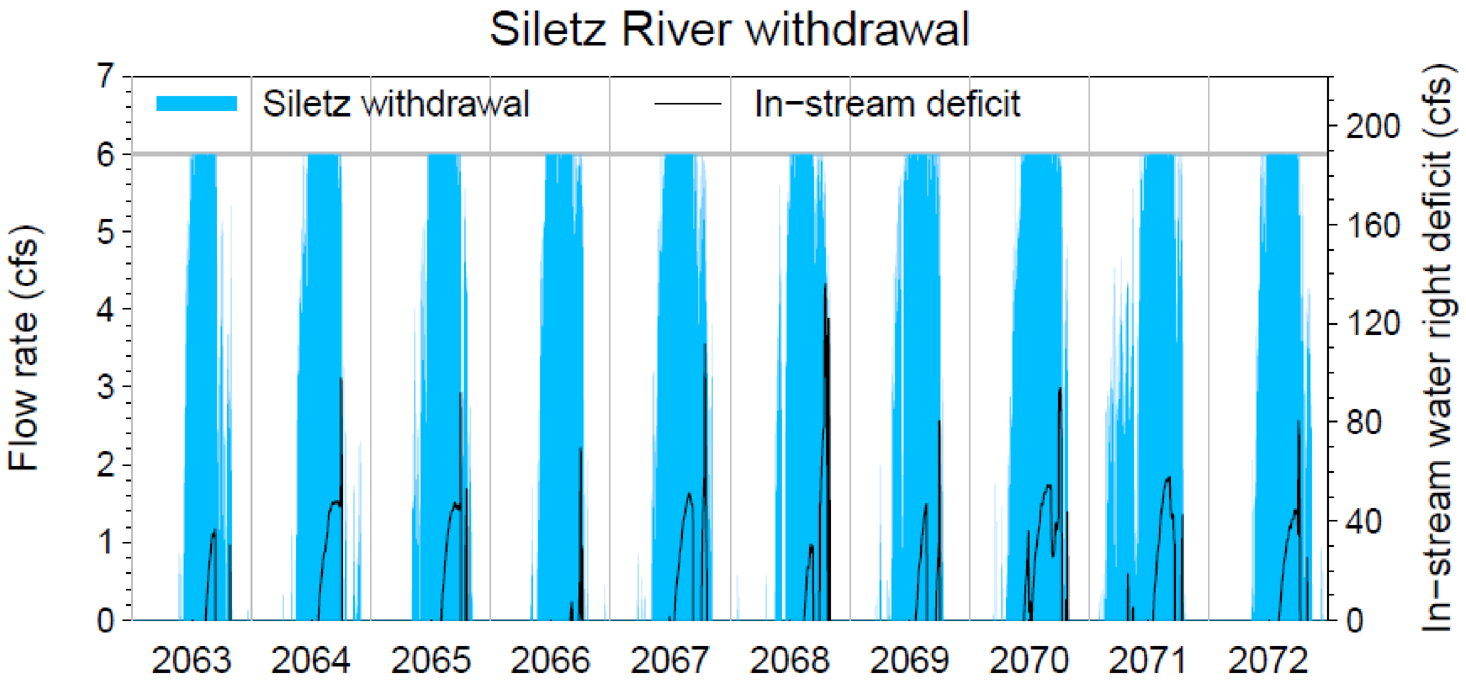


Using full Siletz water right all summer

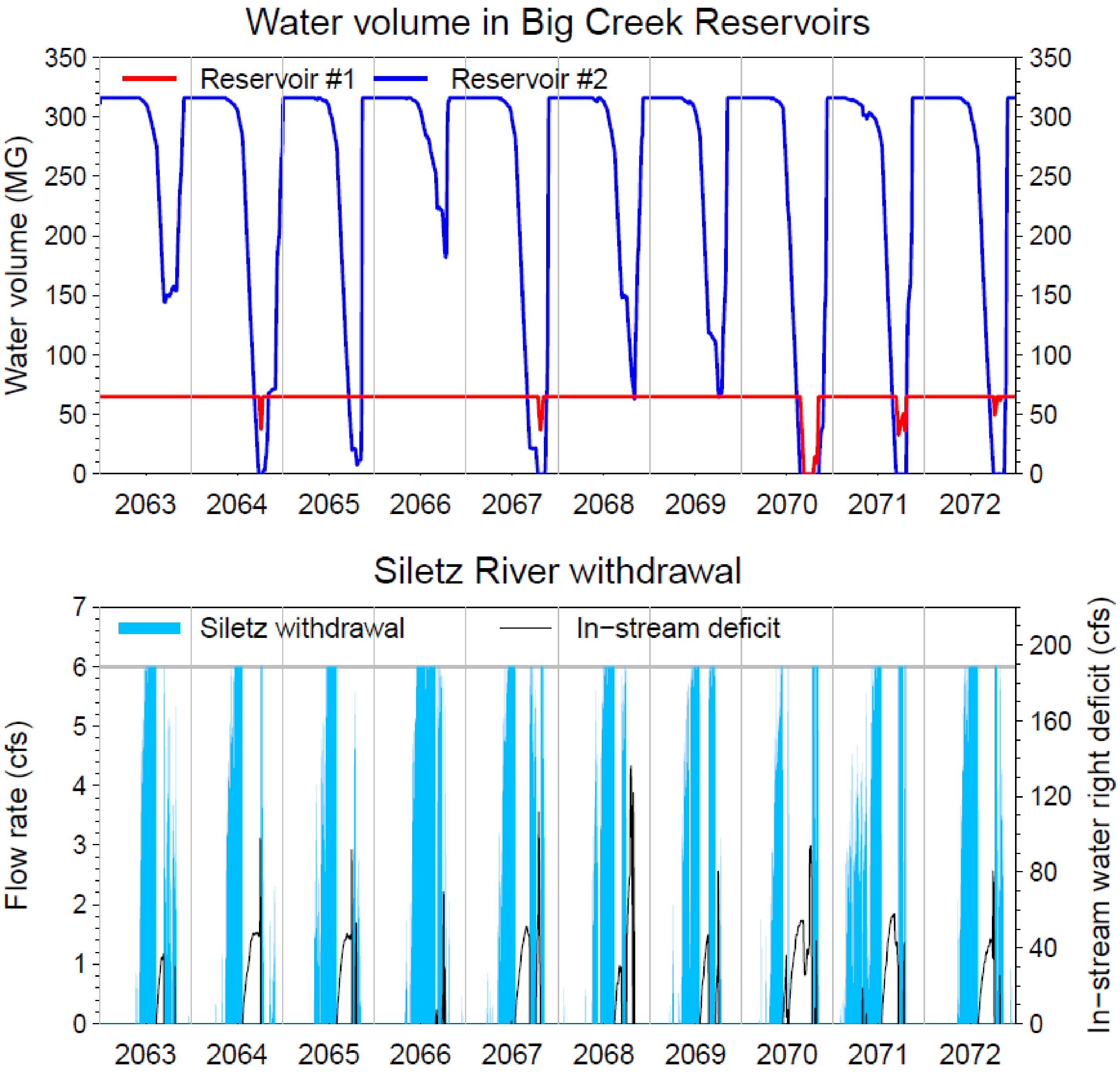


Alternative 2:

No Siletz R. withdrawals when flow below in-stream water right

Storage will be insufficient to meet demand some years

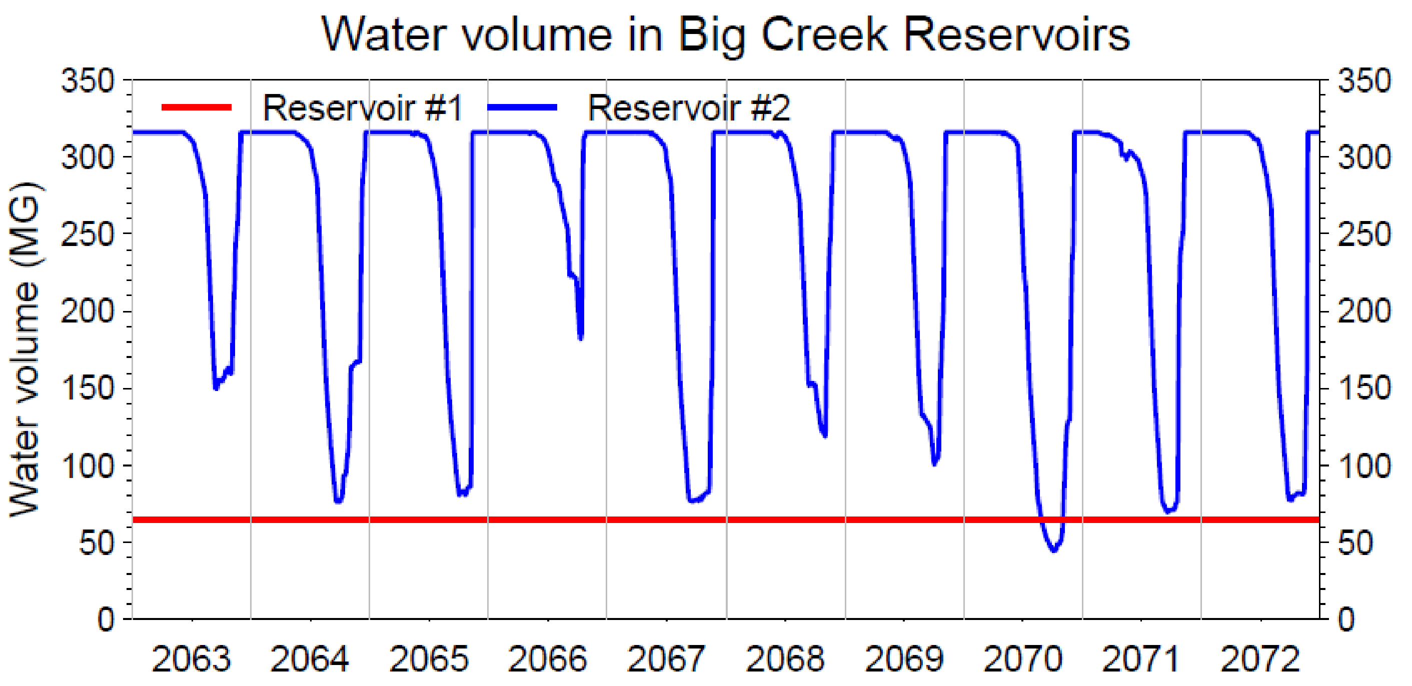
No Siletz R. withdrawals during long periods in summer



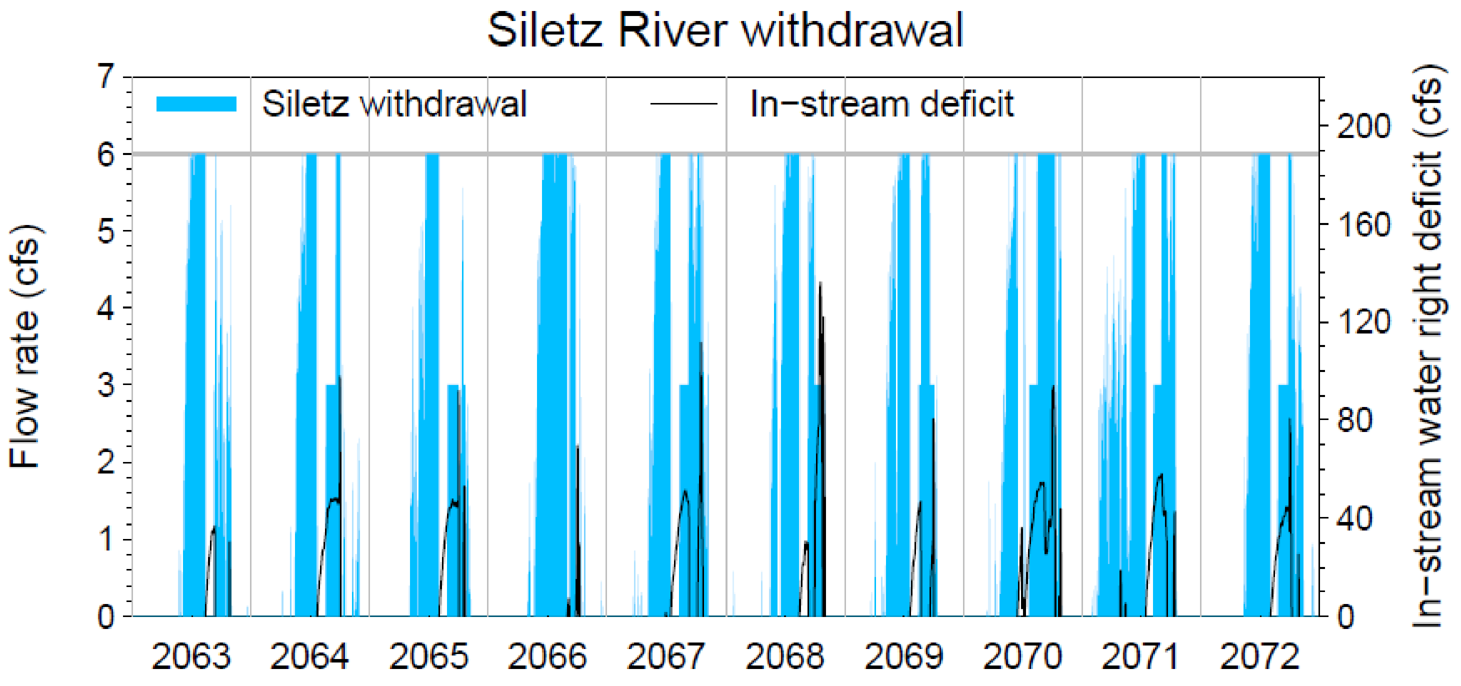
Alternative 3:

No Siletz R. withdrawals when flow below in-stream water right with exceptions

Storage gets uncomfortable low during many years



Siletz R. withdrawals at ½ water right when reservoir storage drops below 50%



What's next?

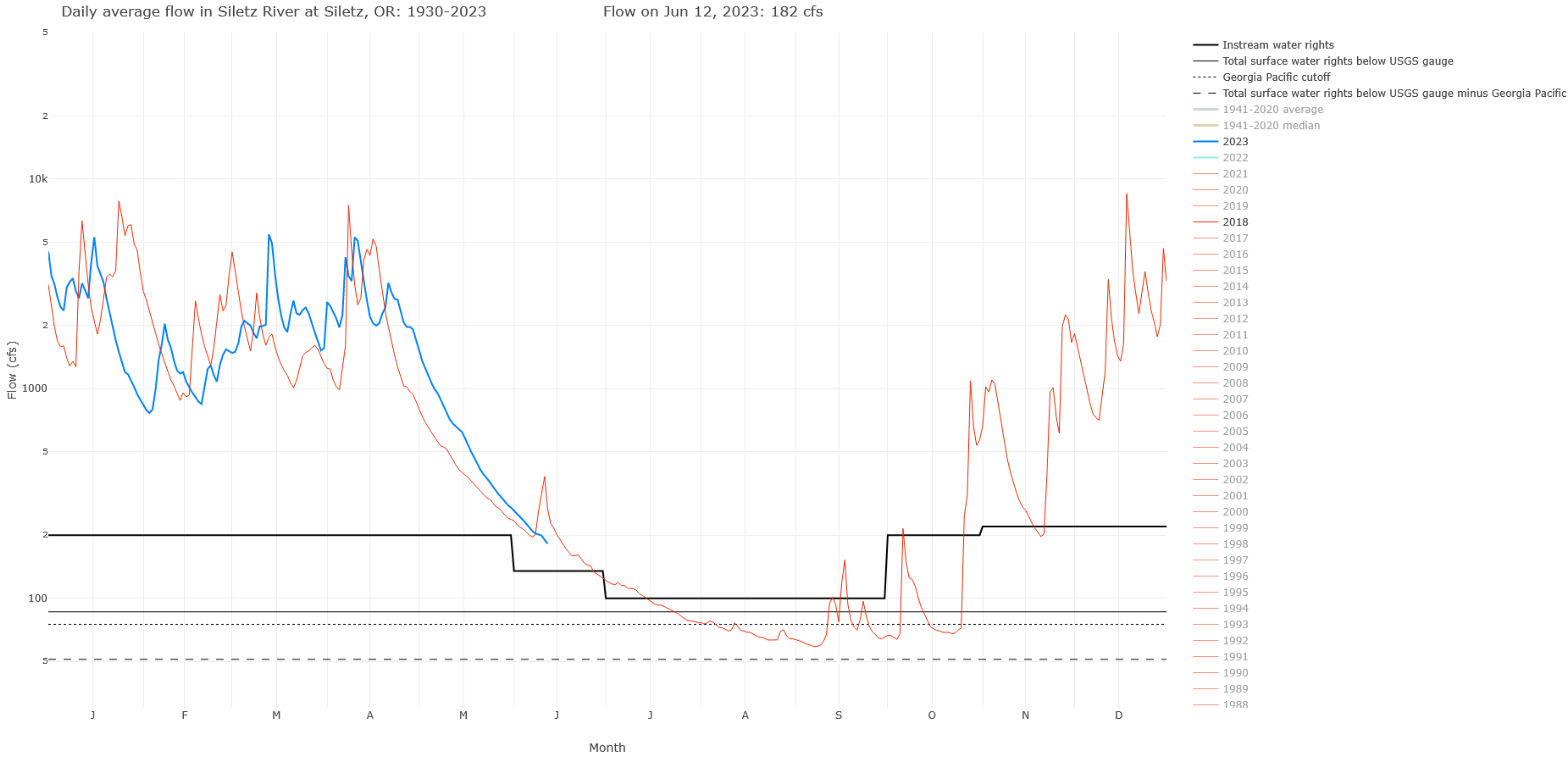
1) Complete and document water demand analysis for multiple districts

2) Get input from this group on how to use time we have left

3) Get input on how we can support Actions beyond the end of this project

Official project end date: August 30, 2023

https://www.nacse.org/~ruppd/siletz.html



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