

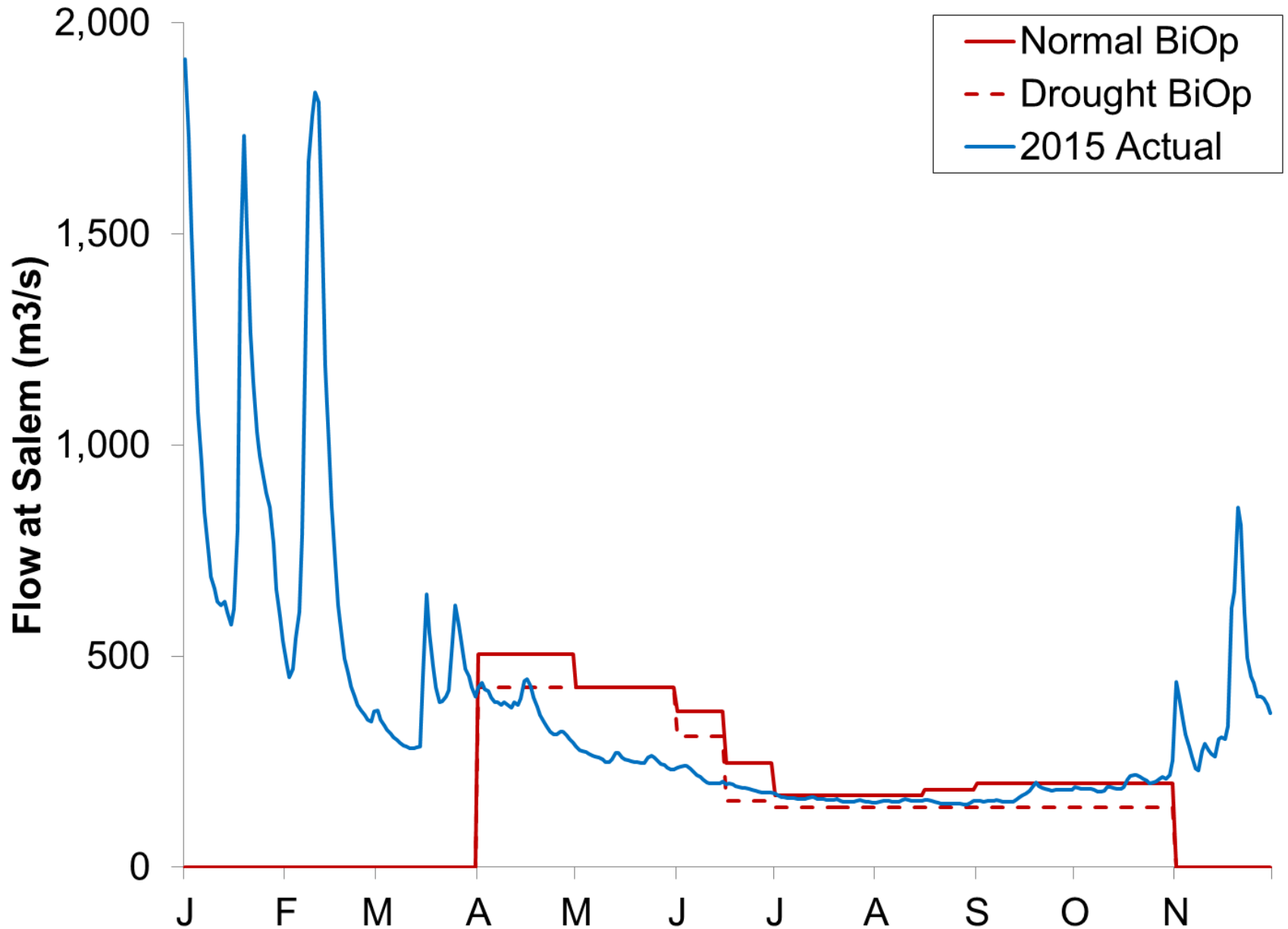
A social science perspective to water scarcity



Photo Credit: Twelvism

Kathleen Moore, Ph.D.
Oregon State University

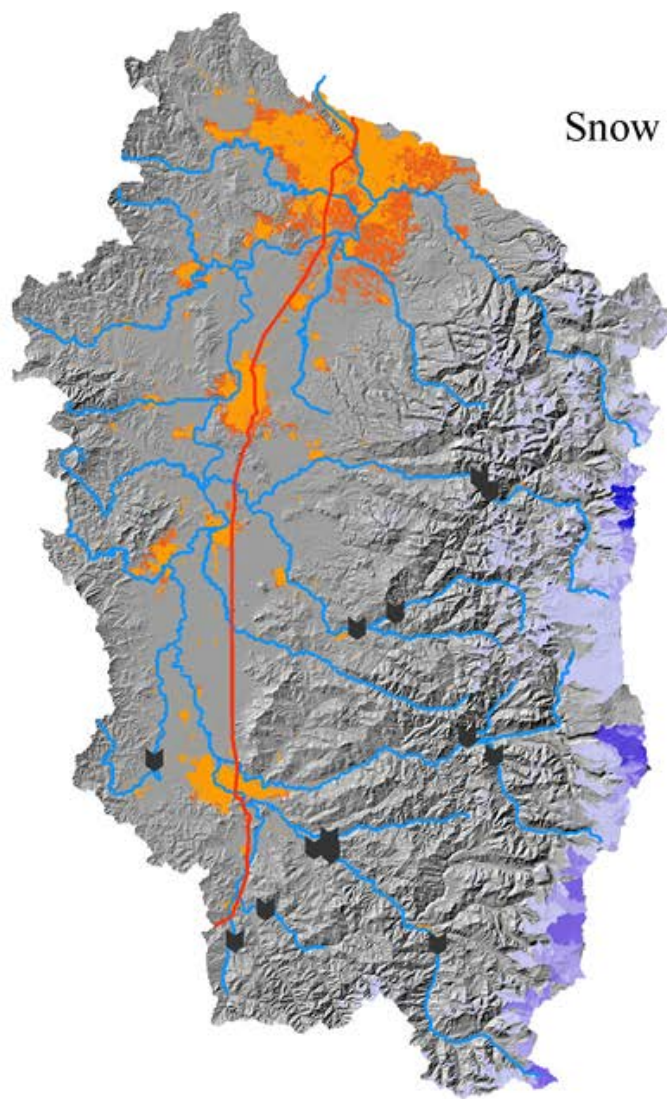
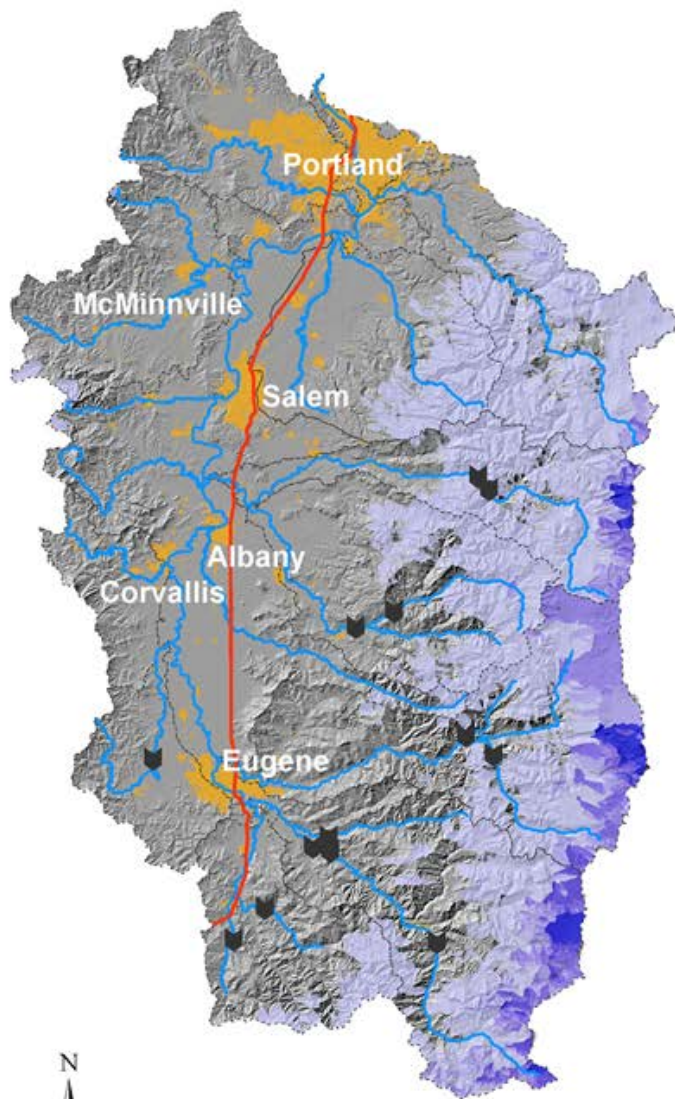
Realized Instream Flow Shortfall



The Willamette River Basin

2010 - 2030

2080 - 2100



Federal Reservoir

I-5

Subbasin

Snow Water Equivalent

25 - 100

100 - 250

250 - 500

500 - 750

750 - 1,000

1,000 - 1,500

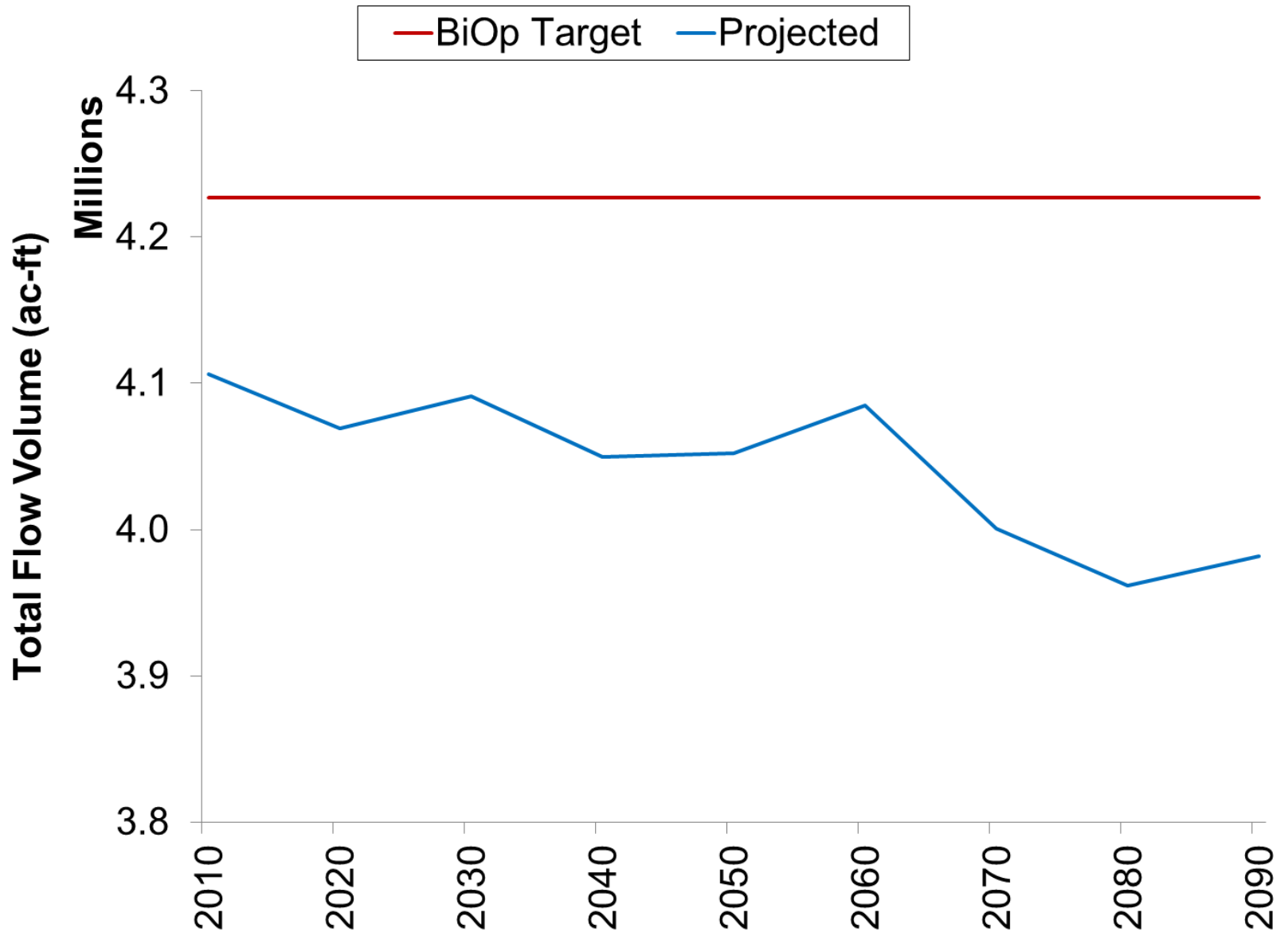
Development

2010

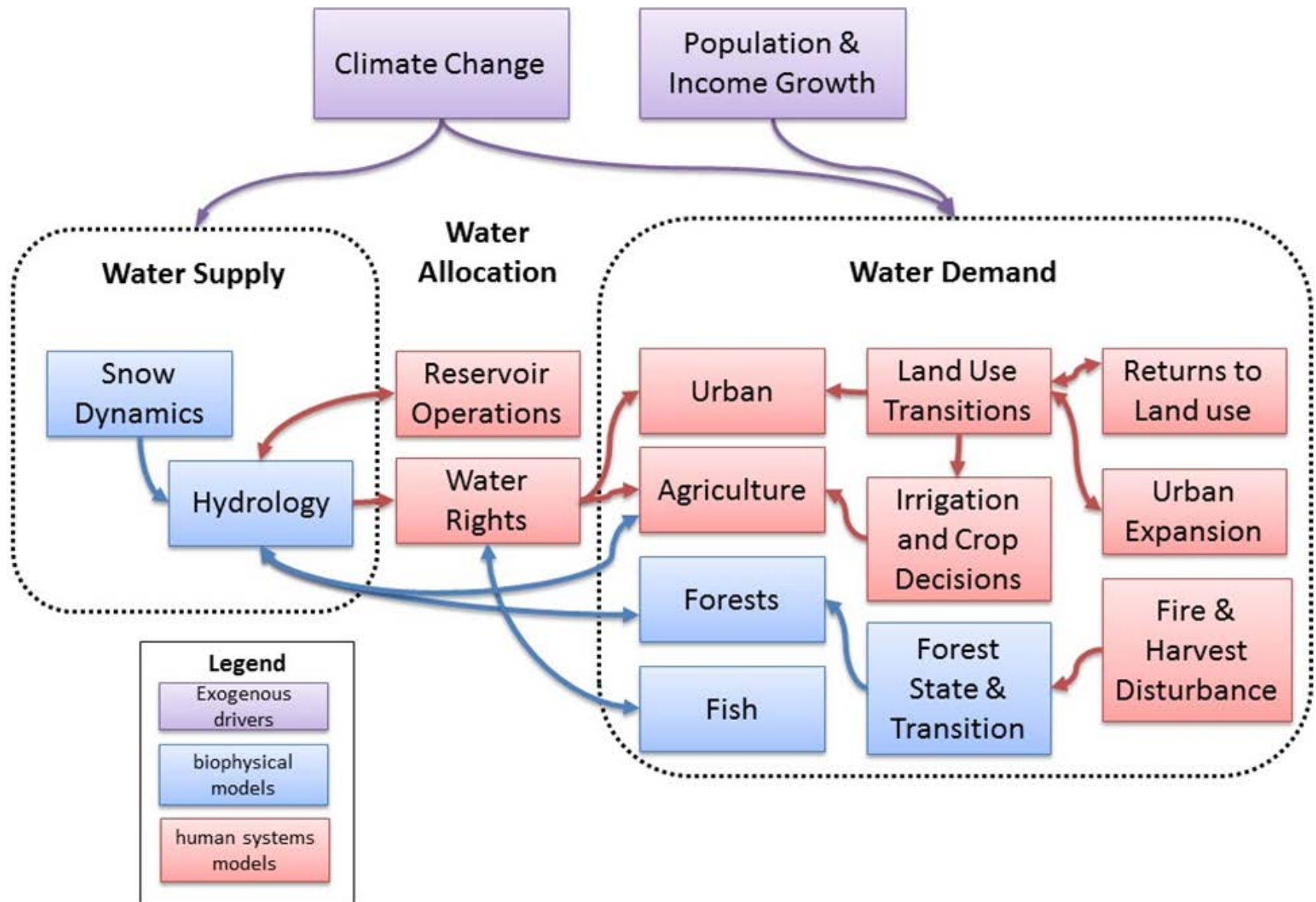
2100



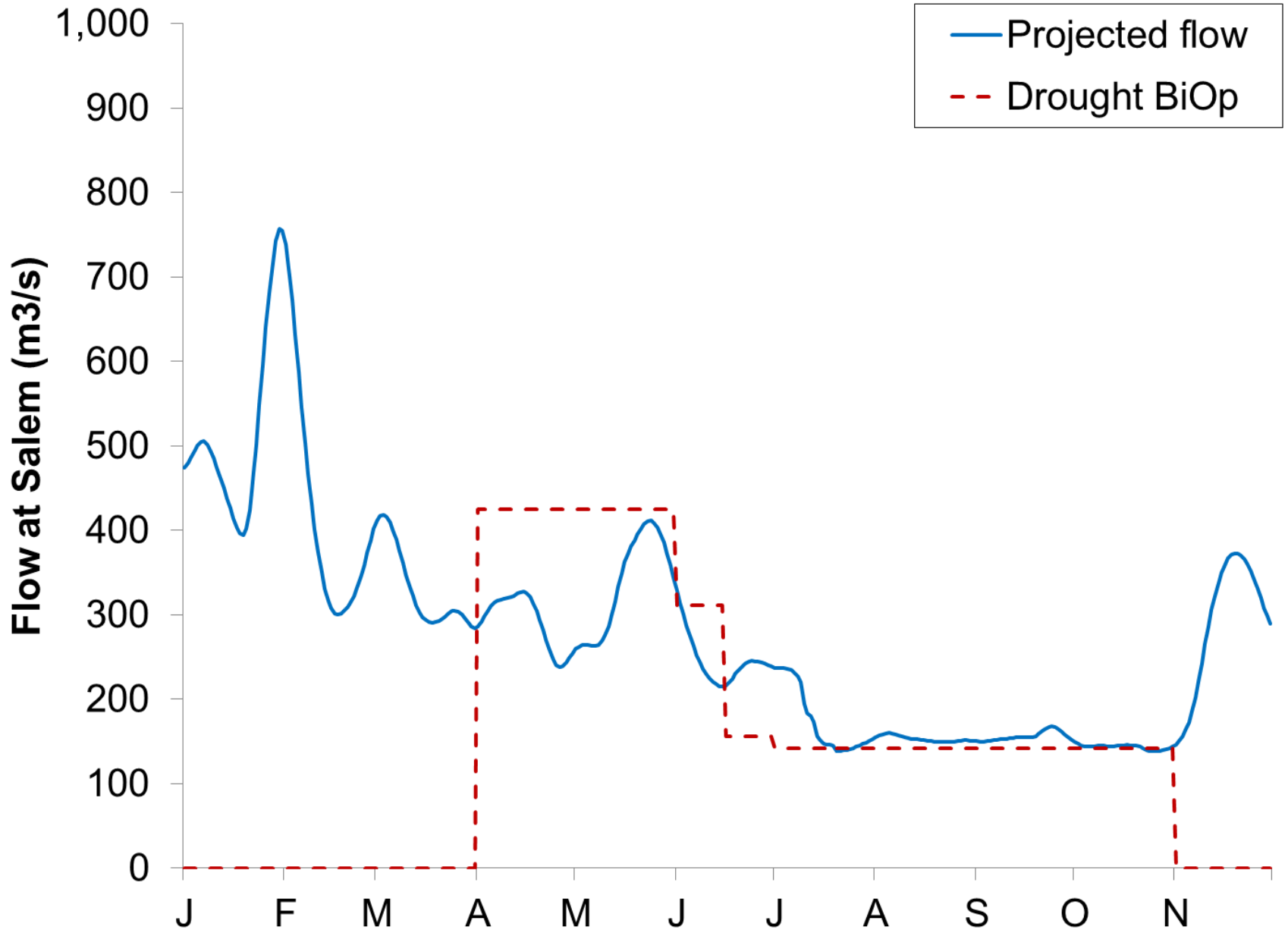
Projected Instream Flow Shortfalls



Willamette Water 2100 Model



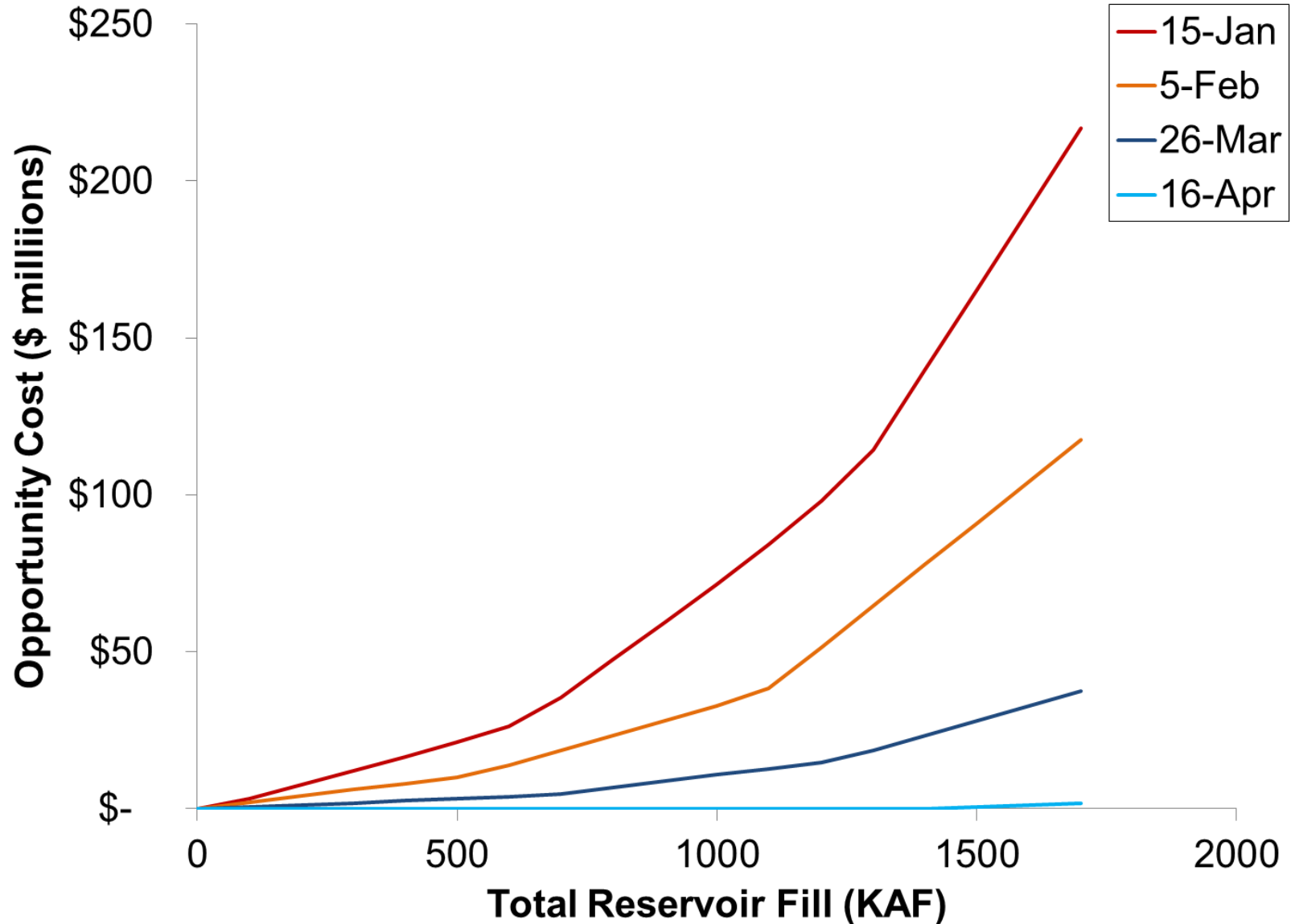
Projected Drought Year Flows



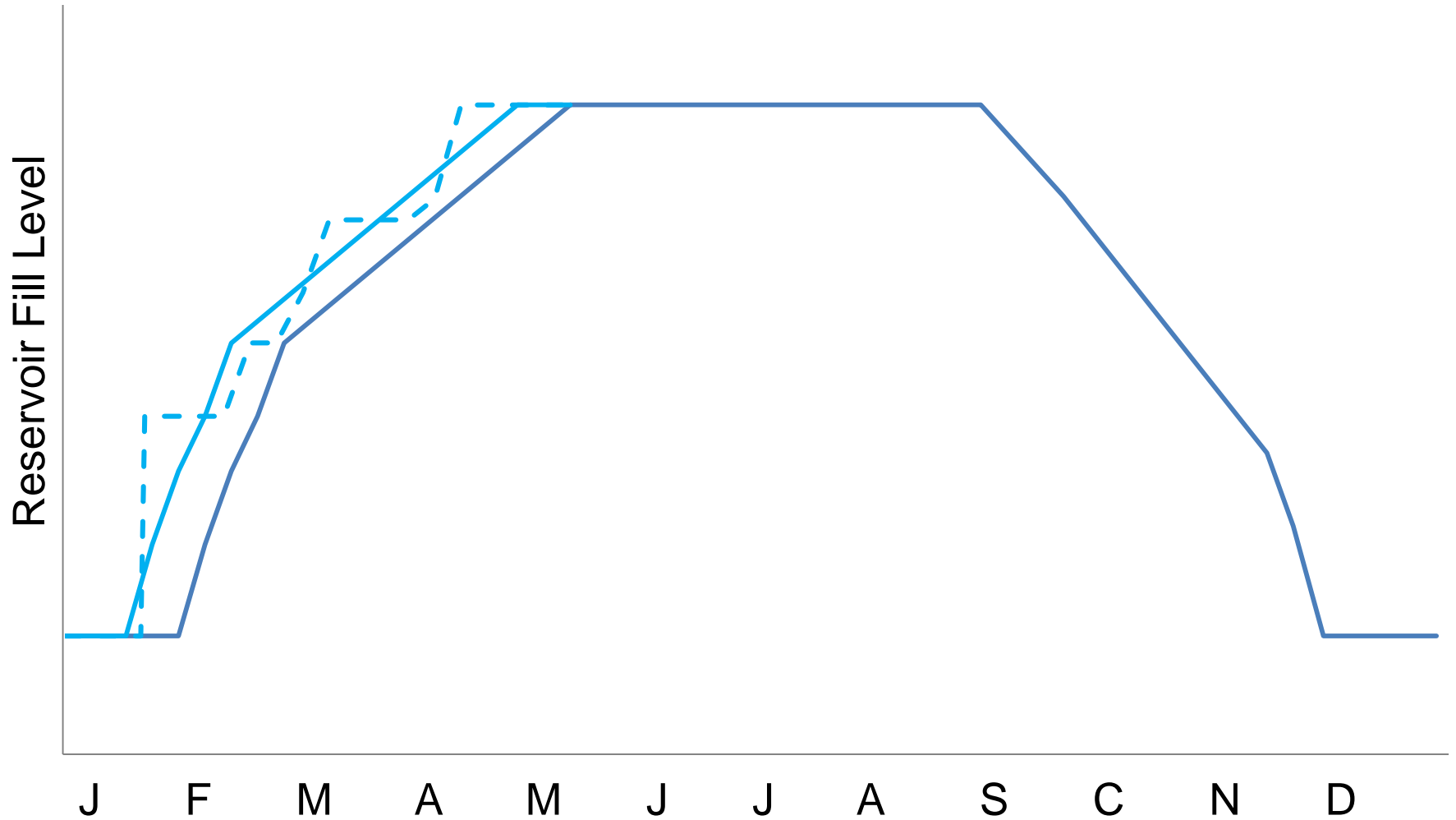
Policy Interventions

- Urban water price increases
- Irrigation disincentives/curtailments
- Modification of reservoir operation rules
 - Earlier start to reservoir refill
 - Faster initial rate of reservoir refill
 - Both

Reservoir Management Trade-offs

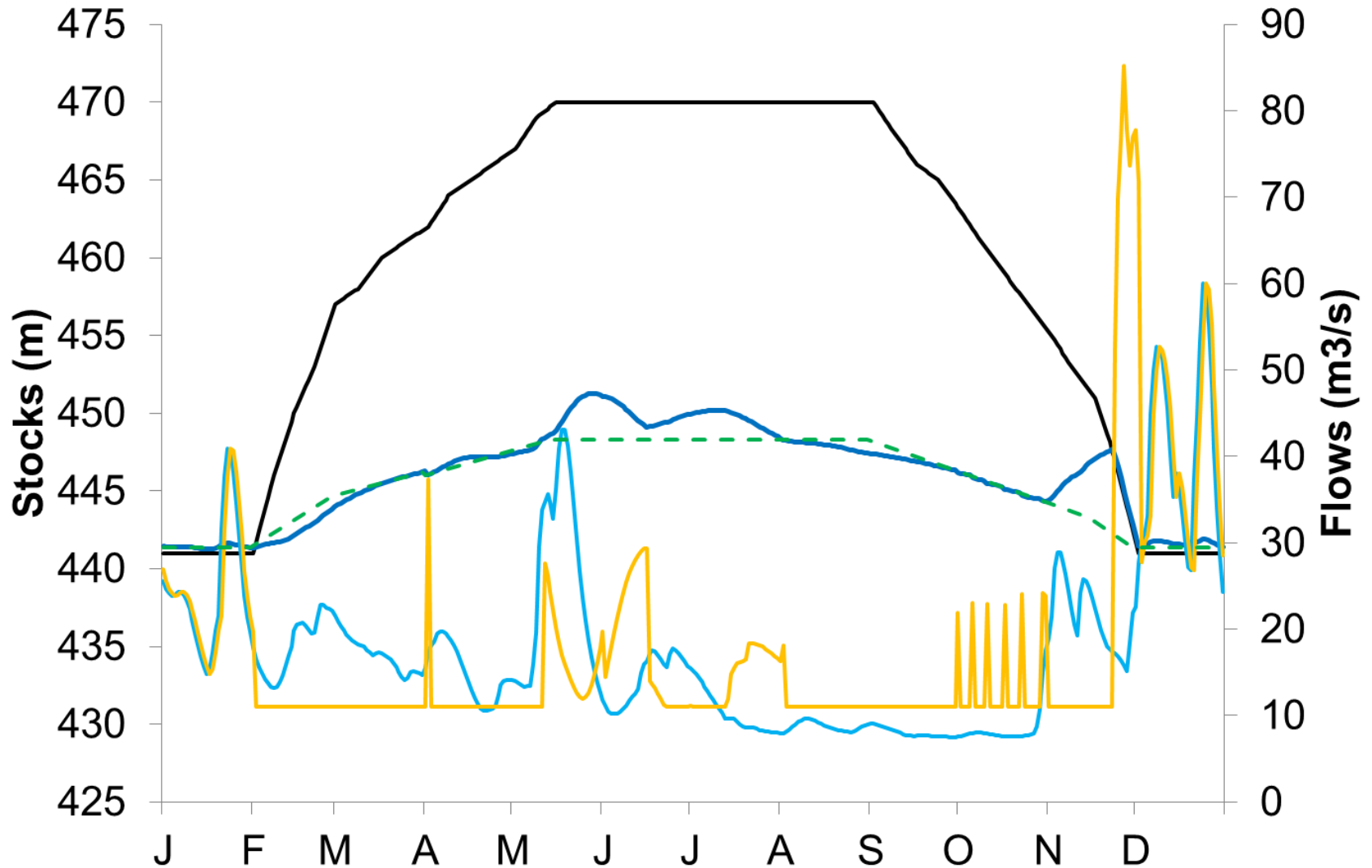


Alternate Rule Curves

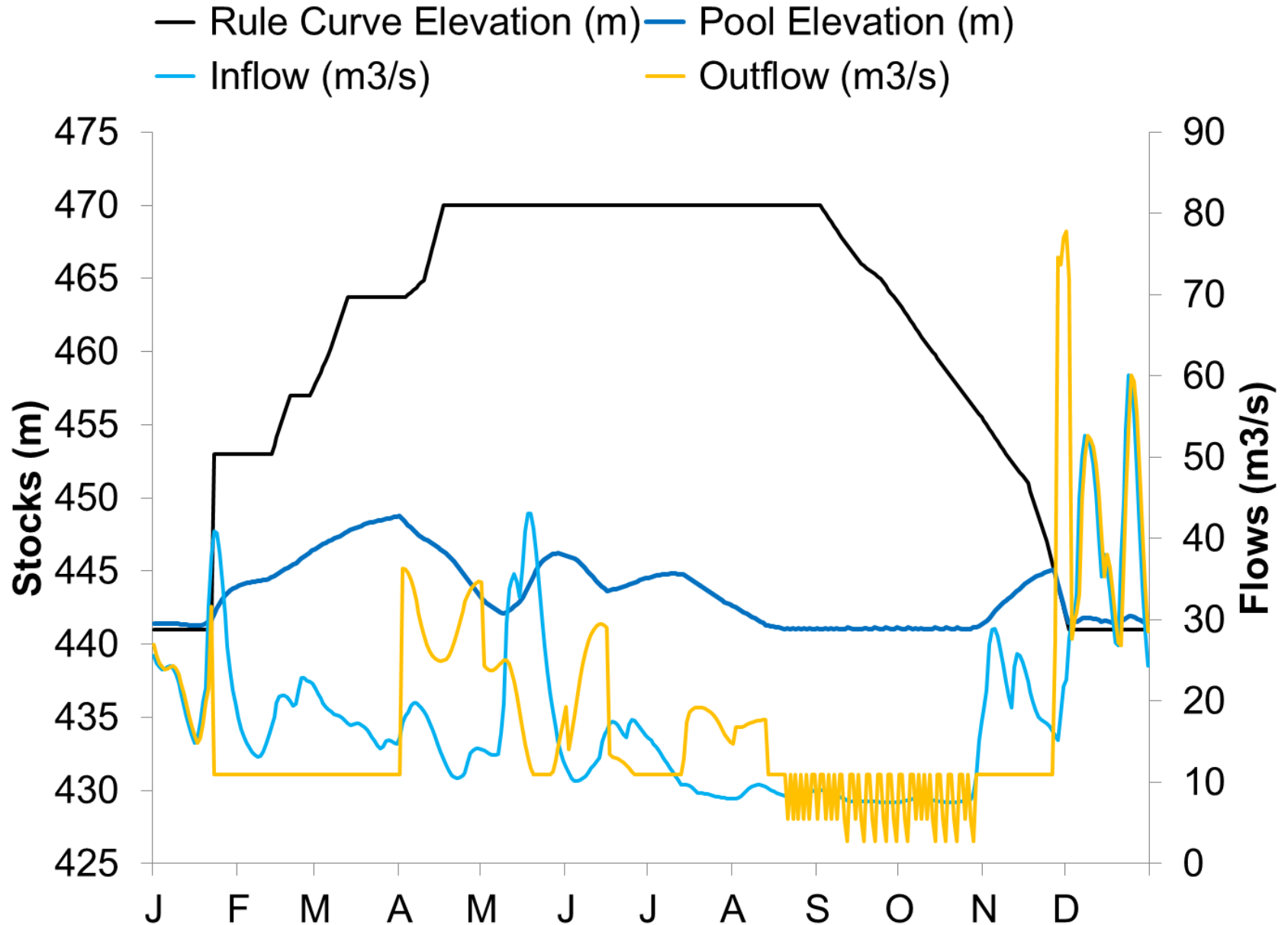


Current Reservoir Operations

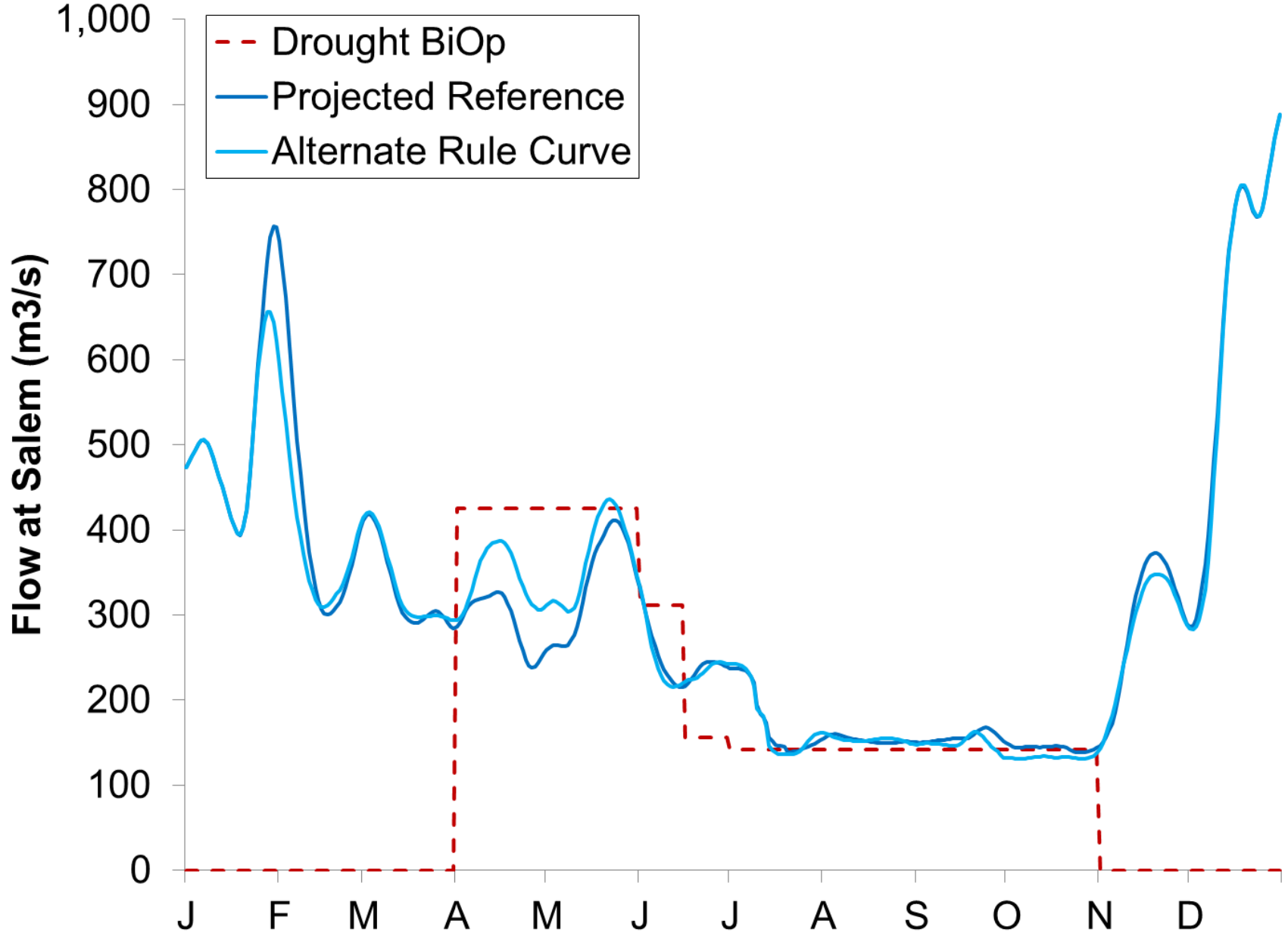
- Rule Curve (m)
- Pool Elevation (m)
- Inflow (m³/s)
- Outflow (m³/s)
- - - Buffer Curve (m)



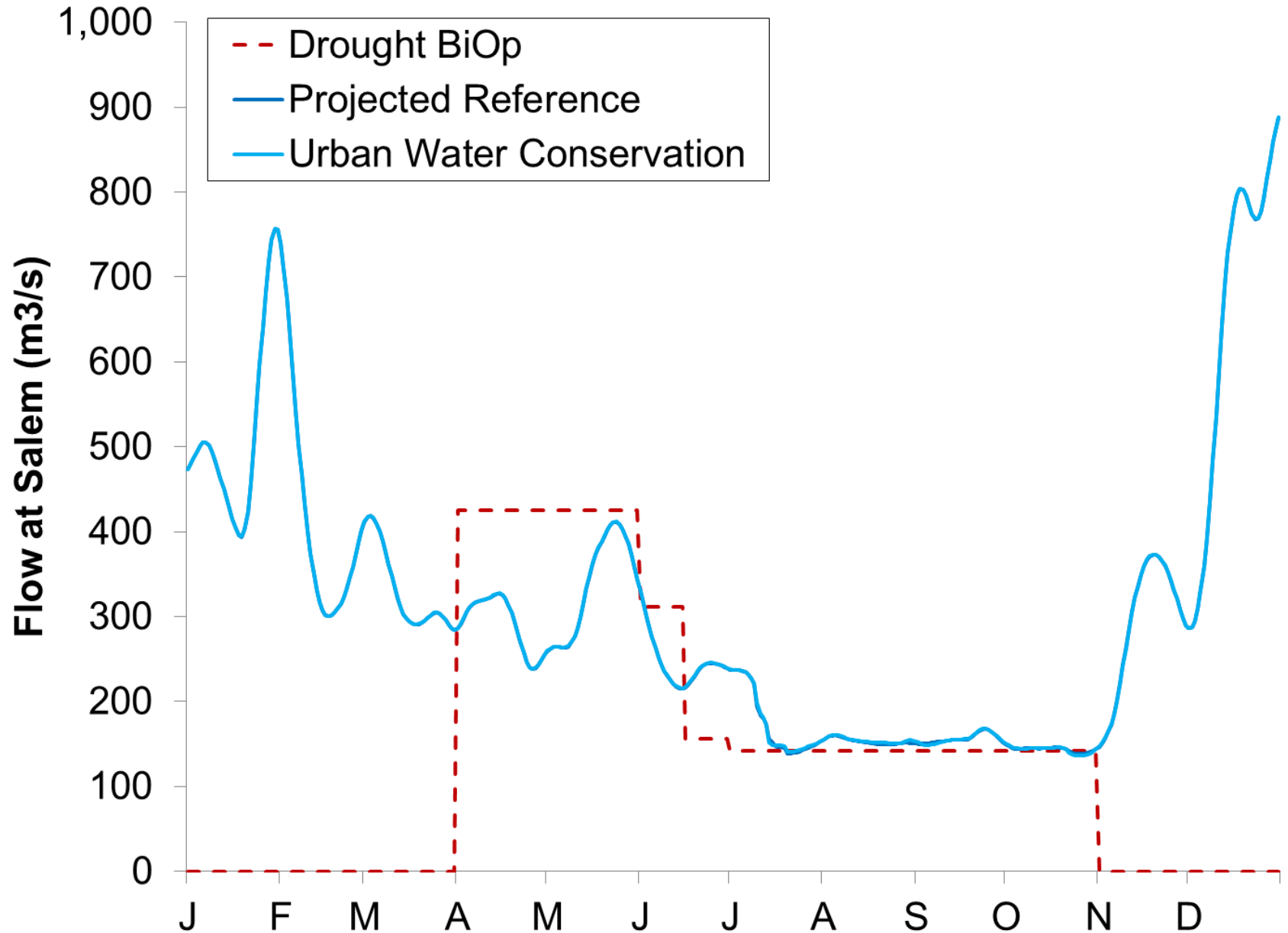
Alternate Reservoir Operations



Flow Augmentation Achieved



Augmentation with Urban Conservation



Summary

- Increasing water scarcity
- Reconsider current management rules
- Weigh opportunity costs
- Compare efficacy of alternate policy interventions



Acknowledgements

- Willamette Water 2100:
<http://inr.oregonstate.edu/ww2100>
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Thank you