A social science perspective to water scarcity

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Realized Instream Flow Shortfall

- Red line: Normal BiOp
- Dashed red line: Drought BiOp
- Blue line: 2015 Actual

Flow at Salem (m³/s)

- J F M A M J J A S O N
The Willamette River Basin

2010 - 2030

2080 - 2100

Federal Reservoir

1-5

Subbasin

Snow Water Equivalent

25 - 1

250 - 26

500 - 251

750 - 501

1,000 - 751

mm 1000<

Development

2010

2100

Oregon
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

The graph illustrates the relationship between Total Reservoir Fill (KAF) and Opportunity Cost ($ millions) for different dates:
- 15-Jan
- 5-Feb
- 26-Mar
- 16-Apr

The Opportunity Cost increases significantly with the Total Reservoir Fill, particularly noticeable for the 15-Jan and 5-Feb dates. The 26-Mar and 16-Apr lines show a more moderate increase compared to the other dates.
Alternate Reservoir Operations

- Rule Curve Elevation (m)
- Pool Elevation (m)
- Inflow (m³/s)
- Outflow (m³/s)
Flow Augmentation Achieved

- Drought BiOp
- Projected Reference
- Alternate Rule Curve

Flow at Salem (m³/s)
Summary

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