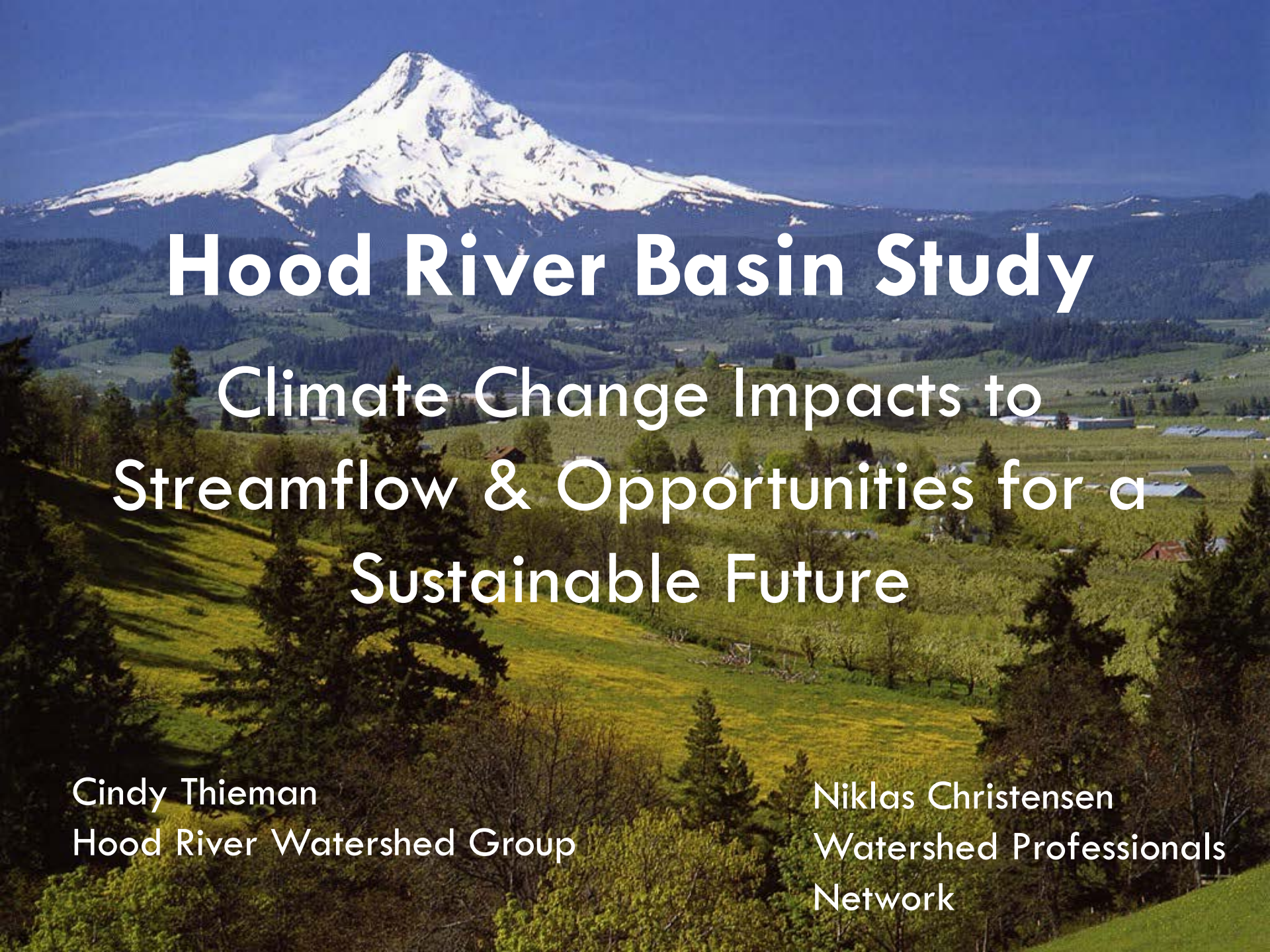


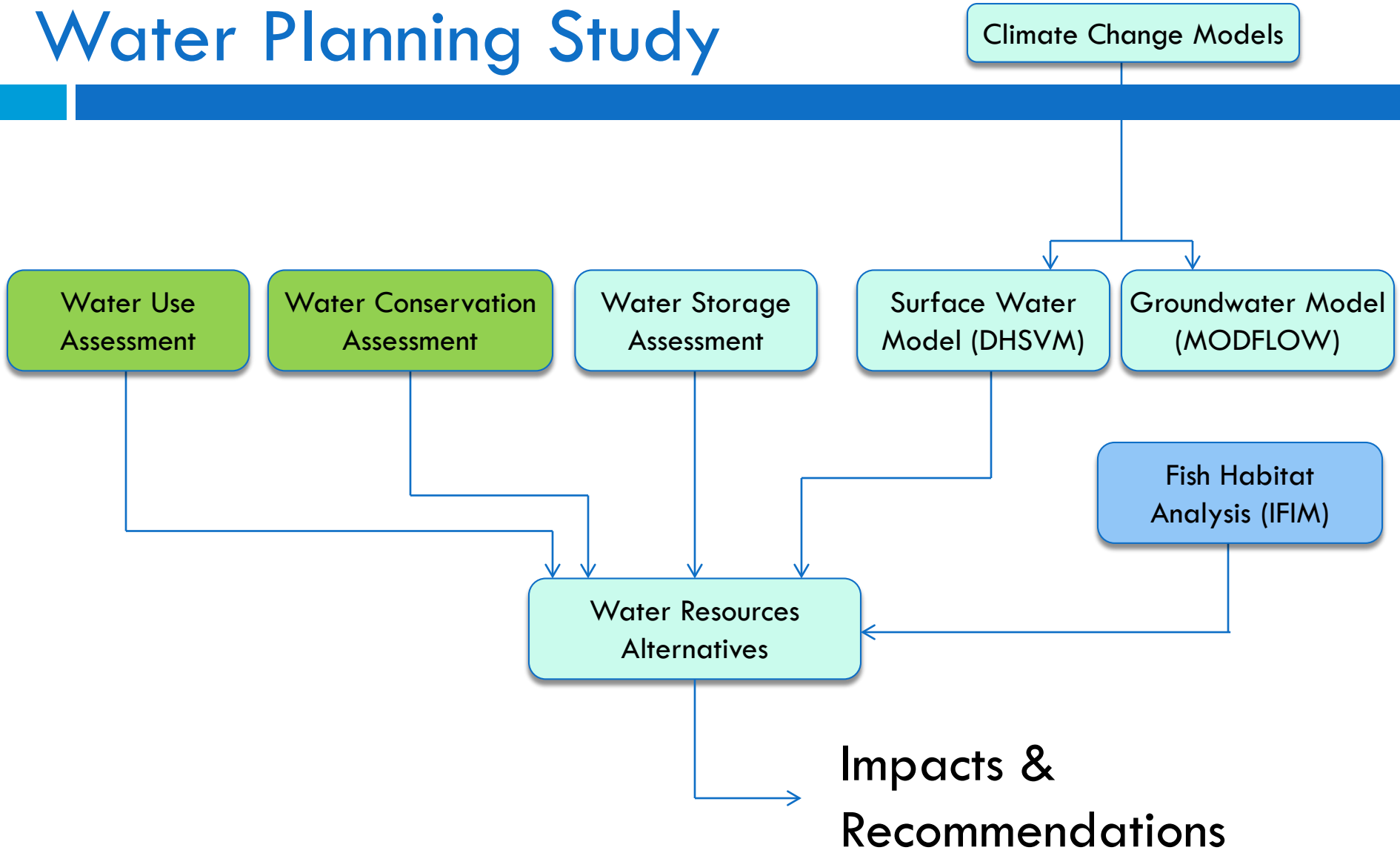
Hood River Basin Study

Climate Change Impacts to Streamflow & Opportunities for a Sustainable Future

Cindy Thieman
Hood River Watershed Group

Niklas Christensen
Watershed Professionals Network

Overview of Water Planning Study



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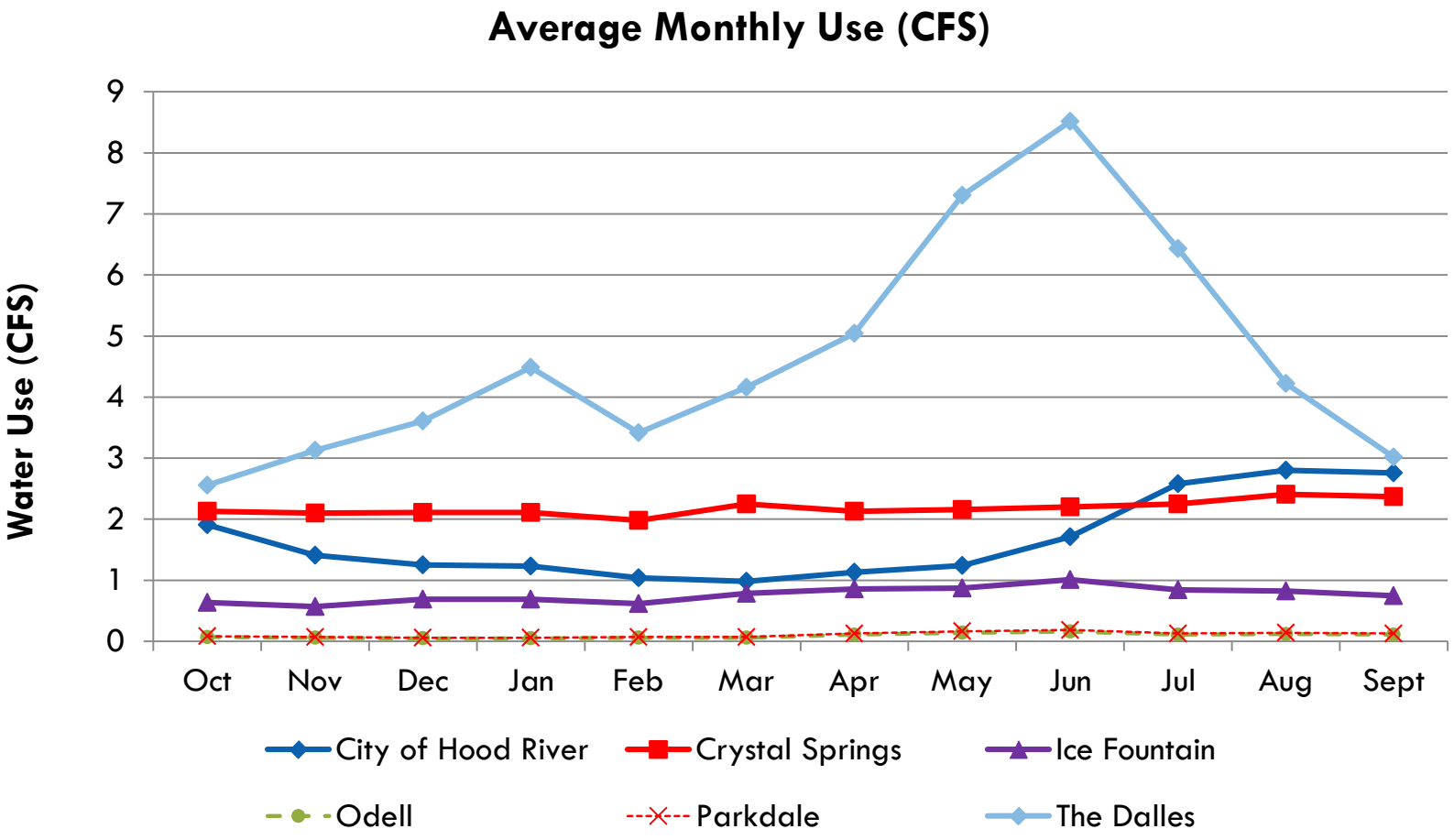
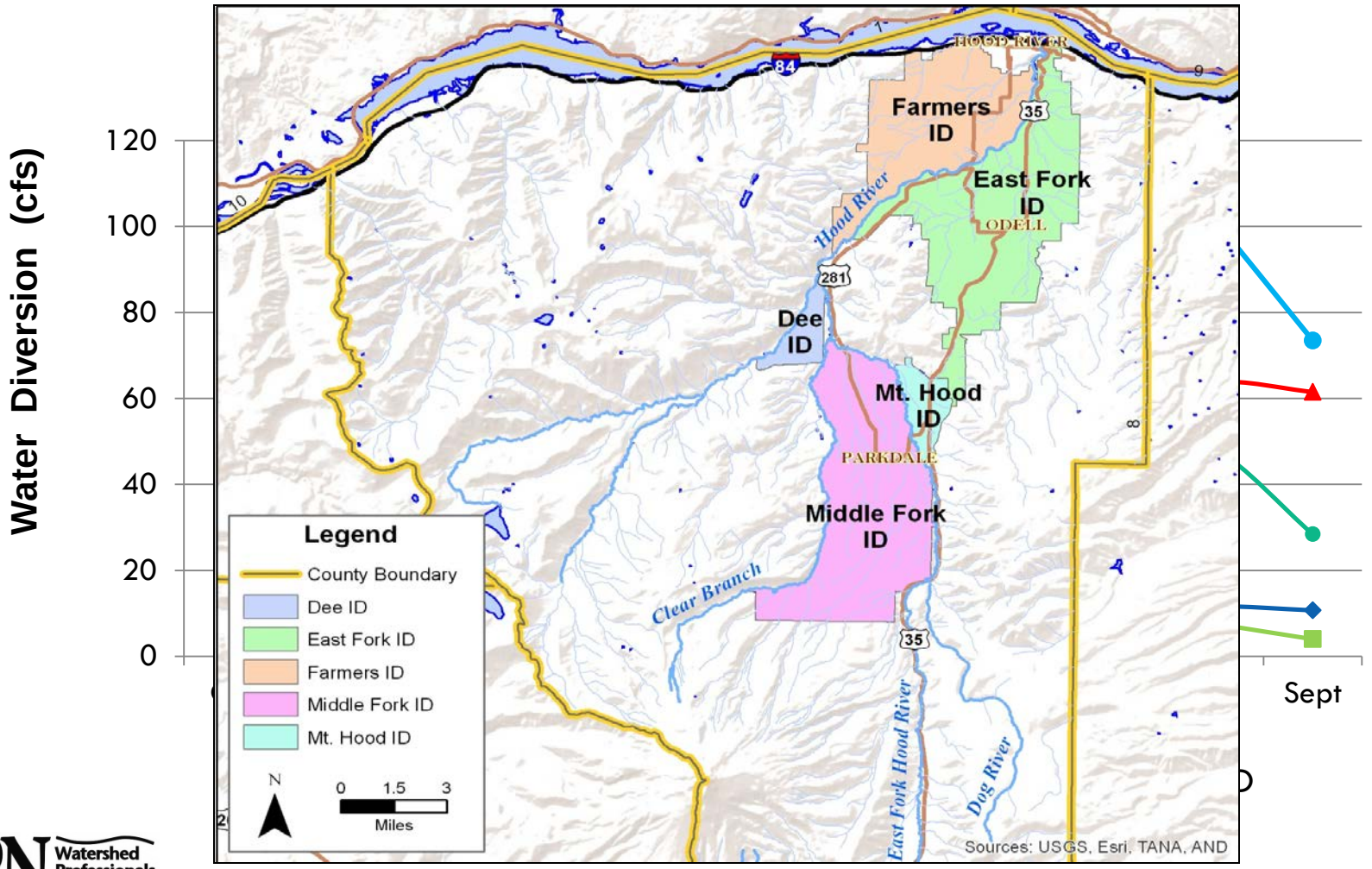
Water Use - Potable



WPN Watershed Professionals Network, LLC

Hood River Watershed Group

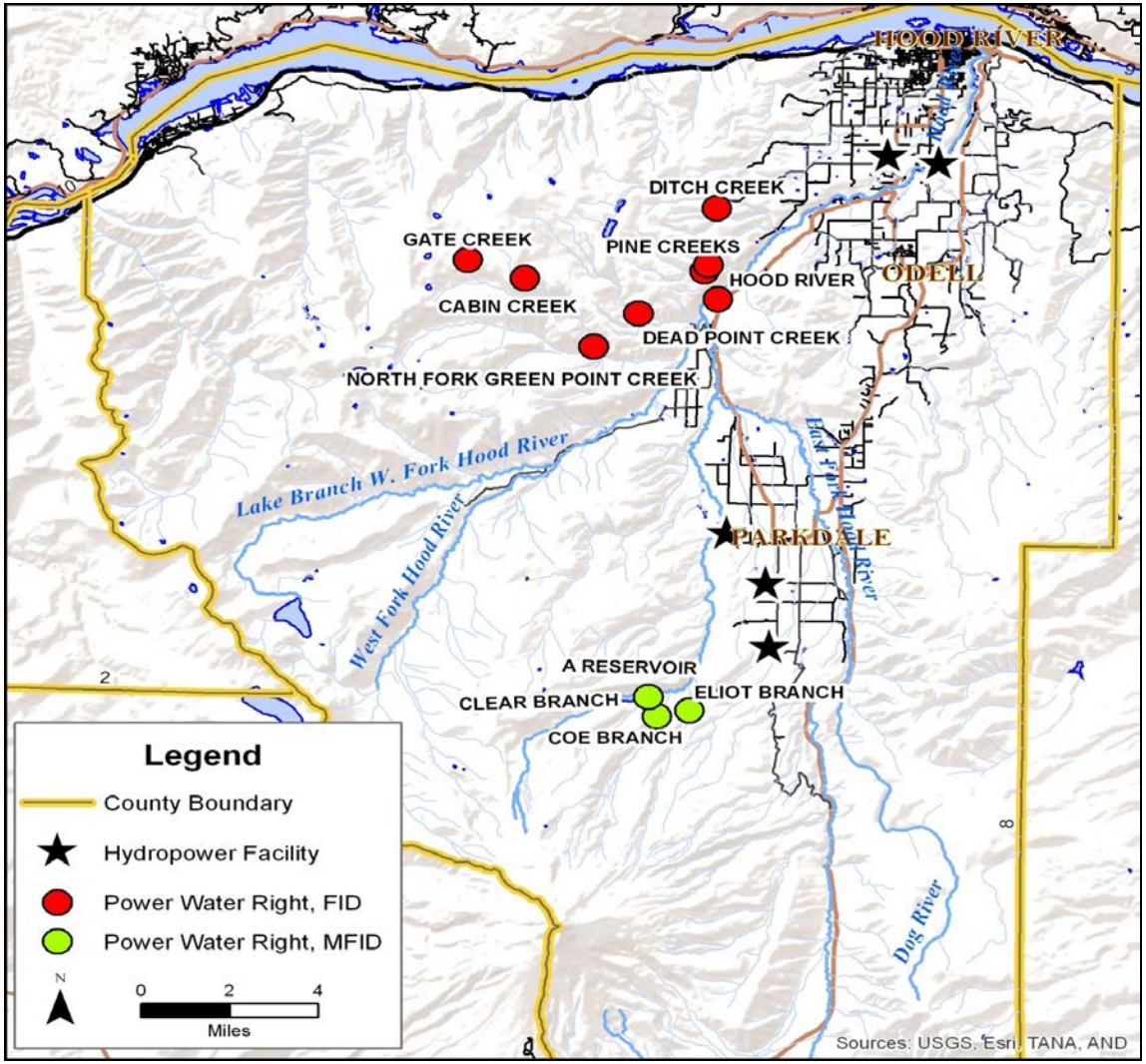
Water Use - Irrigation



WPN Watershed Professionals Network, LLC

Hood River Watershed Group

Water Use - Hydropower



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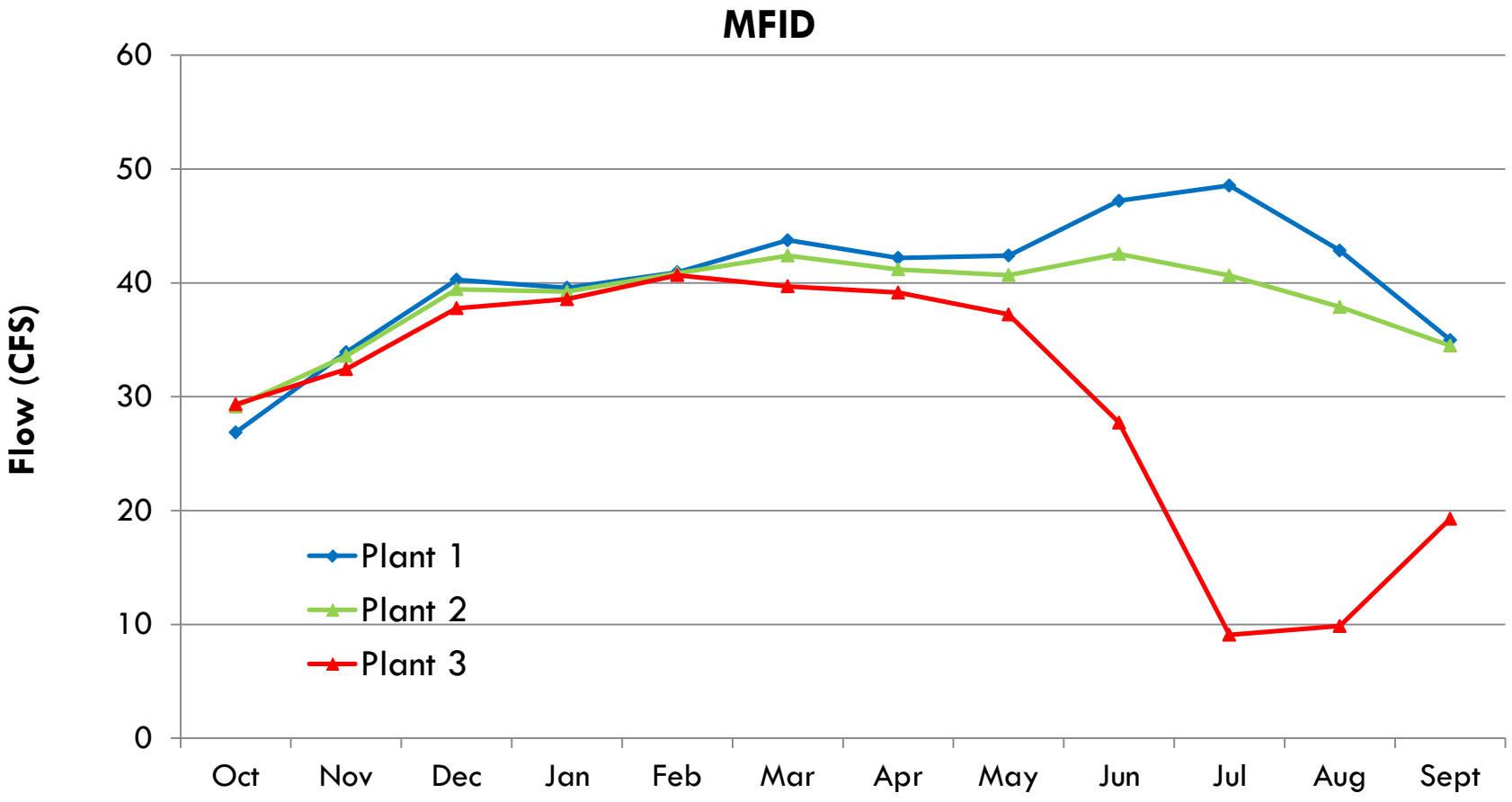
Water Use - Hydropower



Water Use - Instream

Threatened Species:

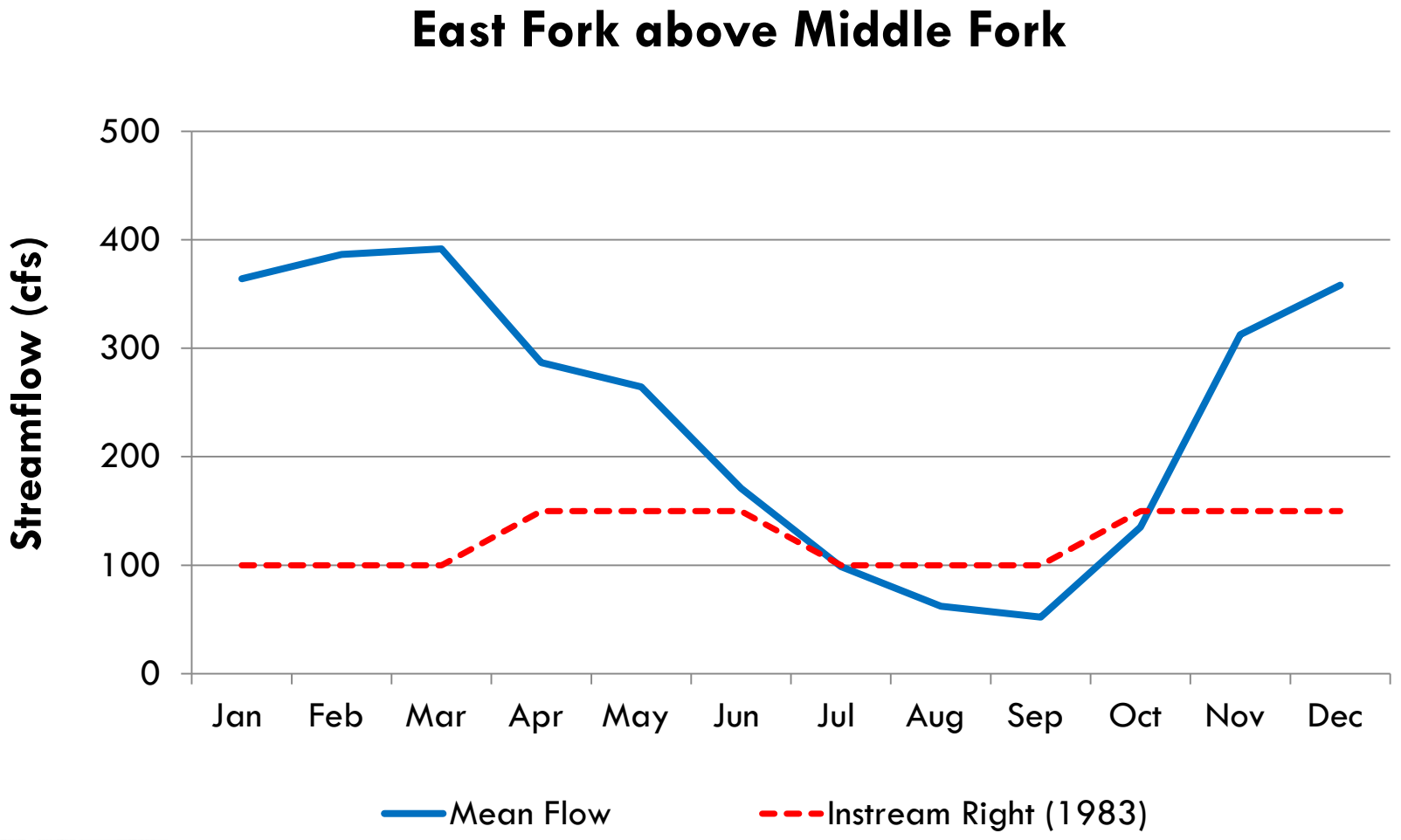
Spring & fall Chinook

Winter & summer steelhead

Coho

Bull trout

Water Use - Instream



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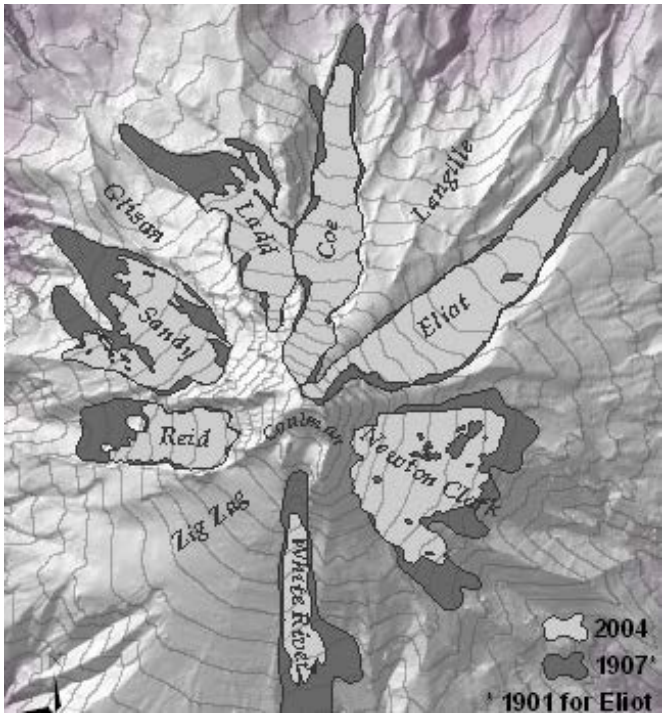
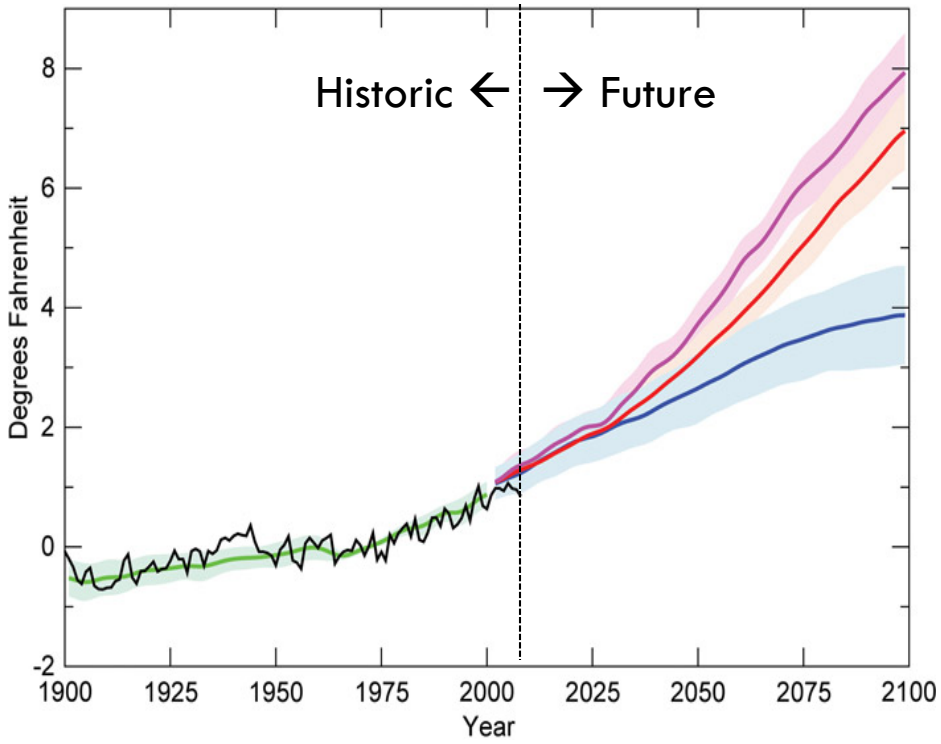
Projected Climate Change (2030-2060)

Mt. Hood Glaciers



Historic & Future Temperature



Projected Temperature Increase → 2.3°F (range of 1.7°F - 3.0°F)

Projected Precipitation Increase → 2.4 % (range of -2.8% - 4.7%)

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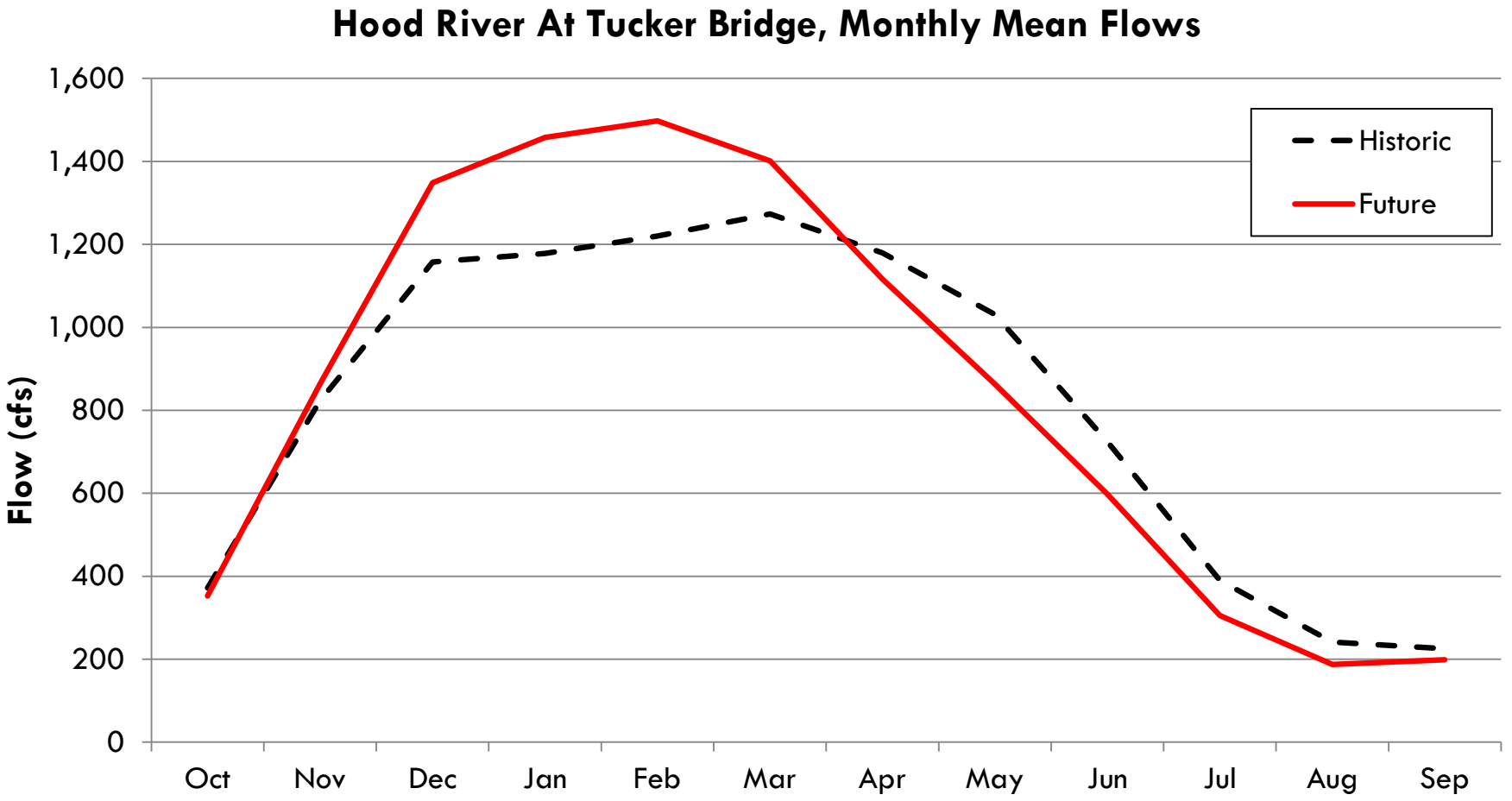
Streamflow



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Hood River

Options to Increase Water Availability

- More groundwater use? (Need more groundwater data to calibrate model)
- Increasing Reservoir Storage- two existing reservoirs have potential to expand (most cost effective); one potential new site
- Potable Water Conservation- relatively small impact
- Irrigation Water Conservation

Water Conservation - Irrigation

Impact sprinklers on handline

→

Solid set micro sprinkler

Open canal

→

New pipe project

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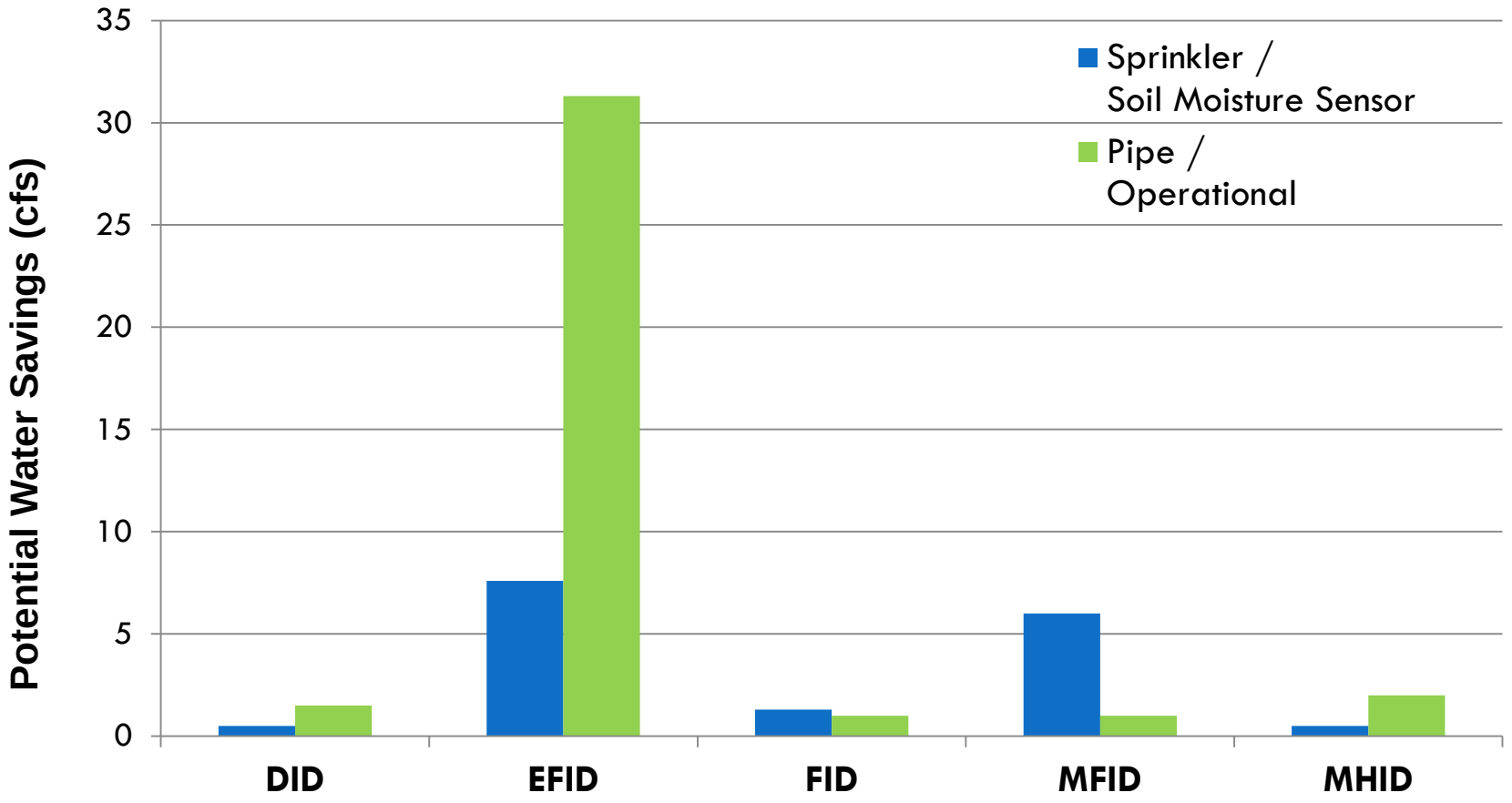
Water Conservation – Irrigation



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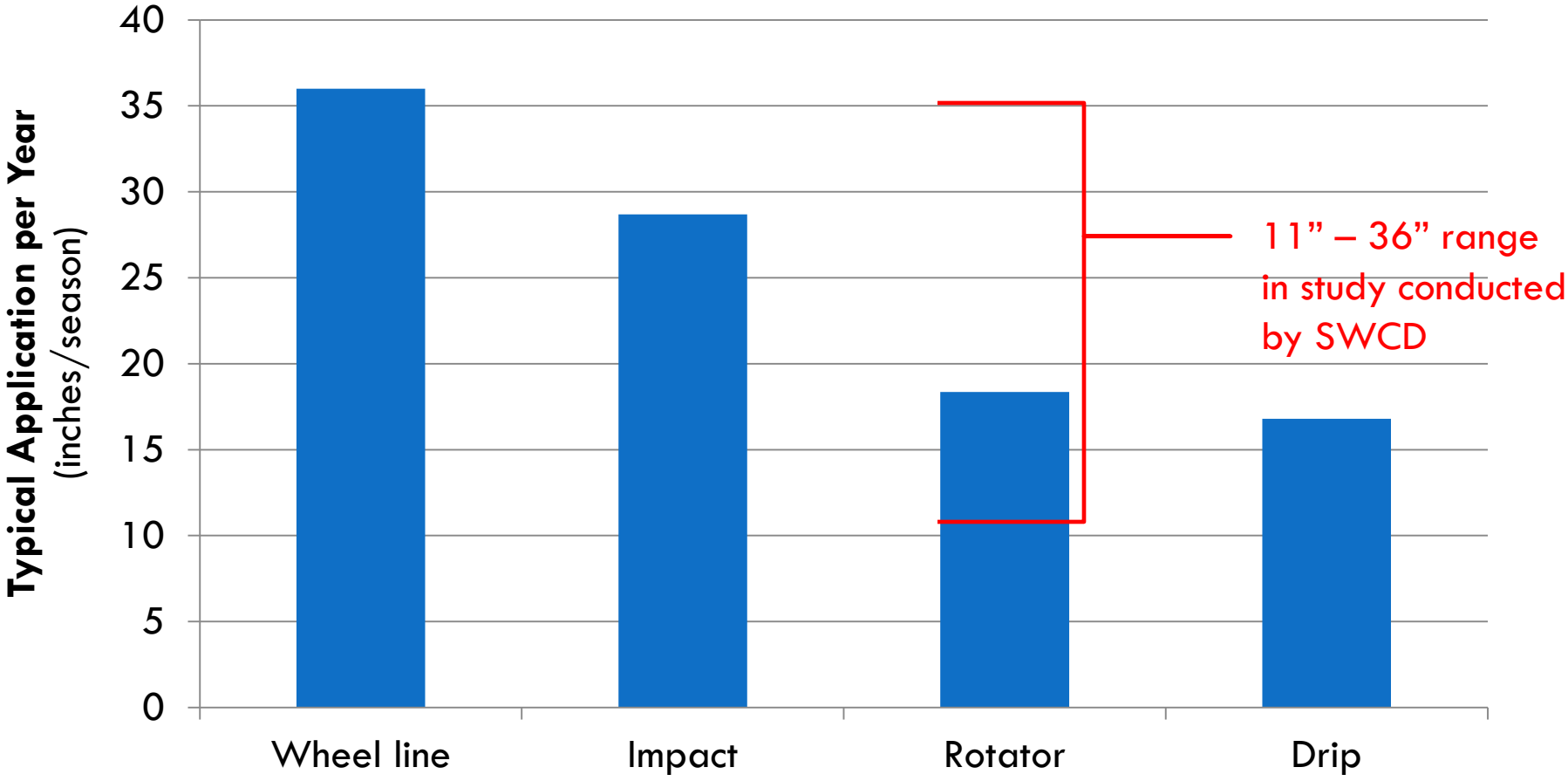
Water Use of Different Application Methods



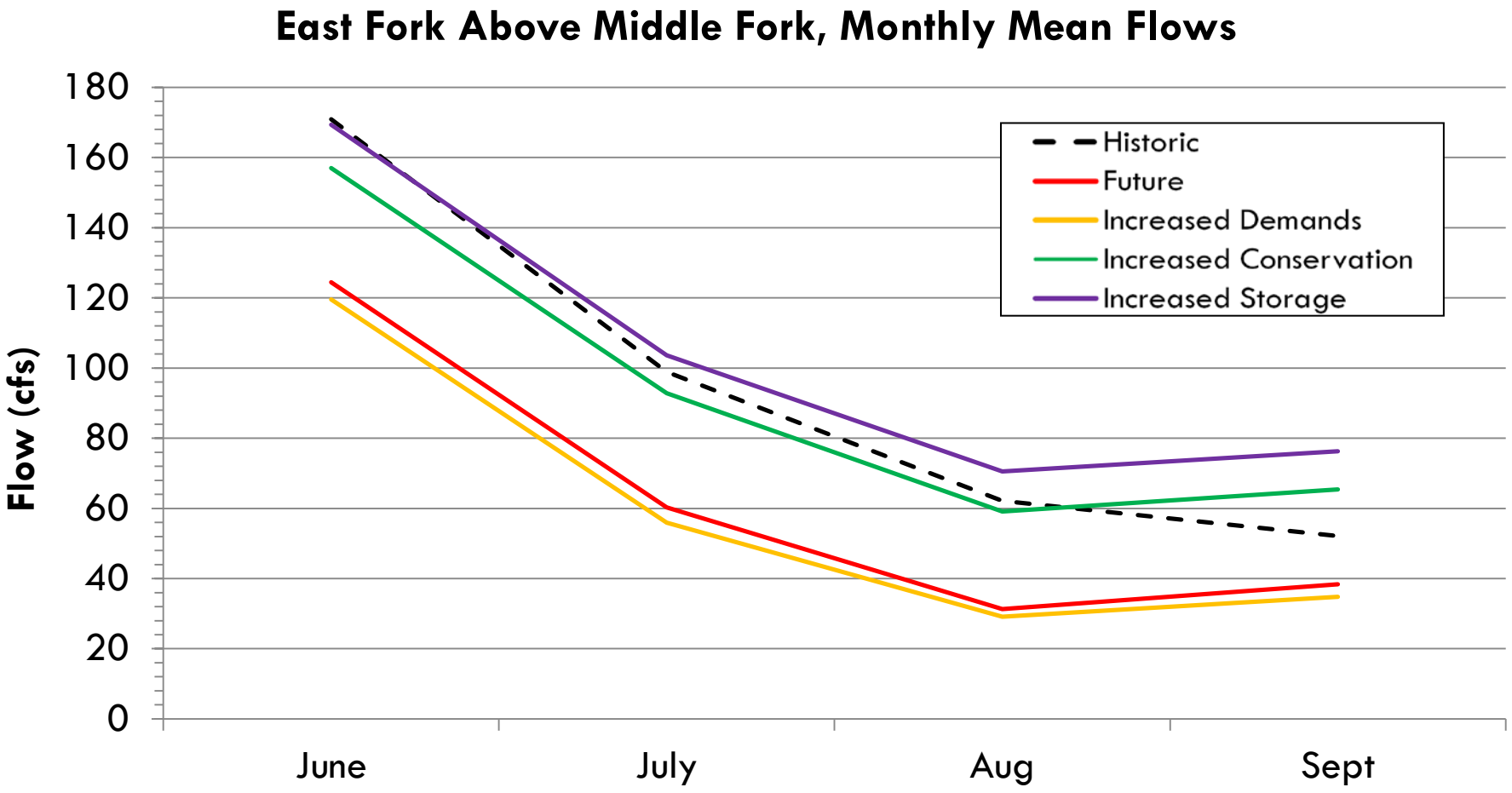
Irrigation Management & Outreach to Orchardists

- Apply water at appropriate rate
  - Exceeding soil absorption rate → crops don't get all of it, soil erodes, wastes water
  - Over-watering can compromise fruit quality & increase costs
  - Using soil moisture sensors is key
  - Micro-sprinklers allow more even application at an appropriate rate
- Micro-sprinklers & drip irrigation improve ability to adequately water in a low-water year
- Efficient watering systems are good for business

Alternative Management Scenarios under Median Climate Change

- "Historic": 1980- 2010 stream flows
- "Future": Climate change only
- "Increased Demand": Climate change + increased demand
- "Increased Conservation": Climate change + increased demand + increased conservation
- "Increase Storage": Climate change + increased demand + increased conservation + increased storage

Streamflow Response to Alternative Management Scenarios
(Average Year/Median Climate Model)



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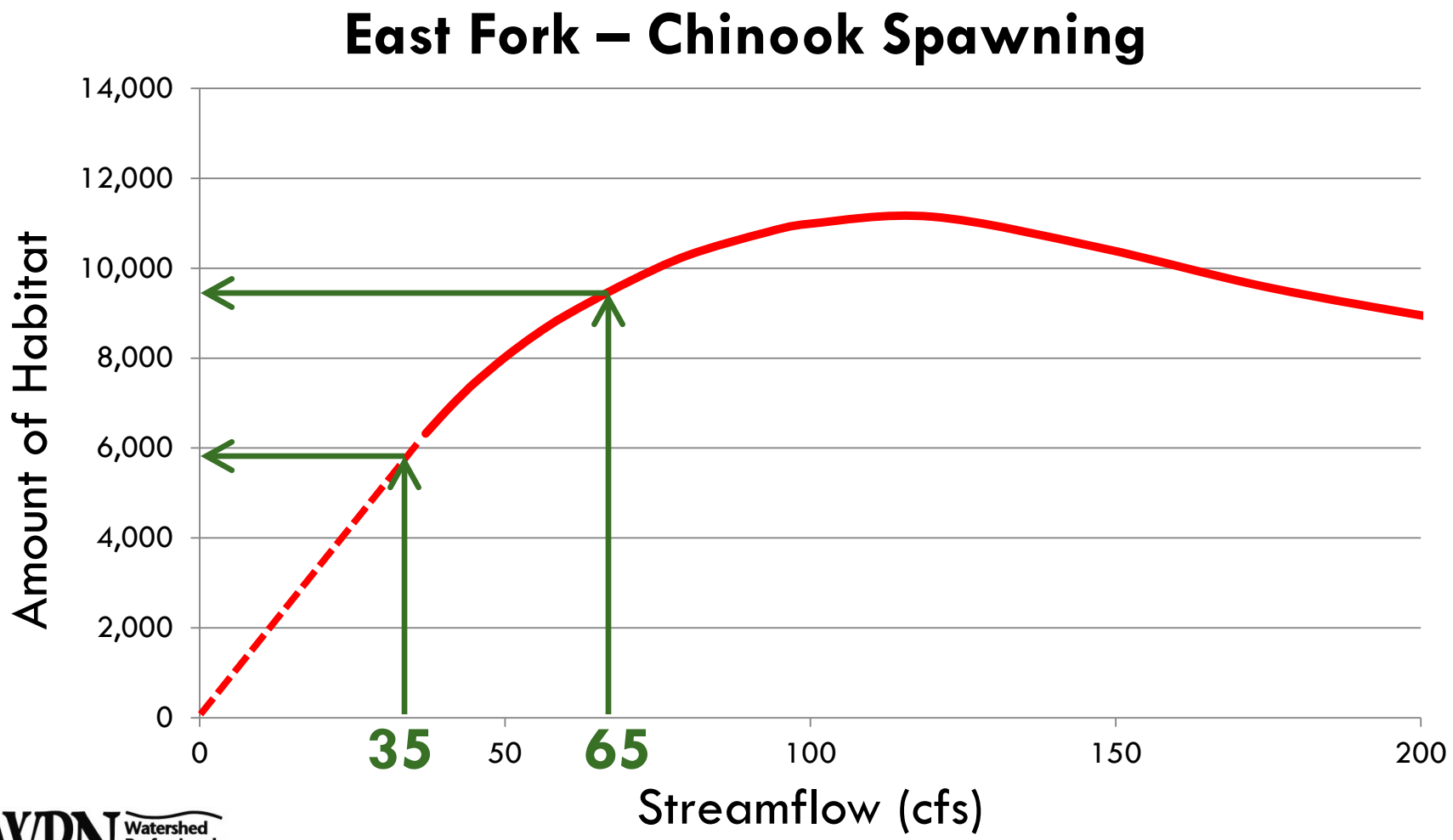
Improved Fish Habitat



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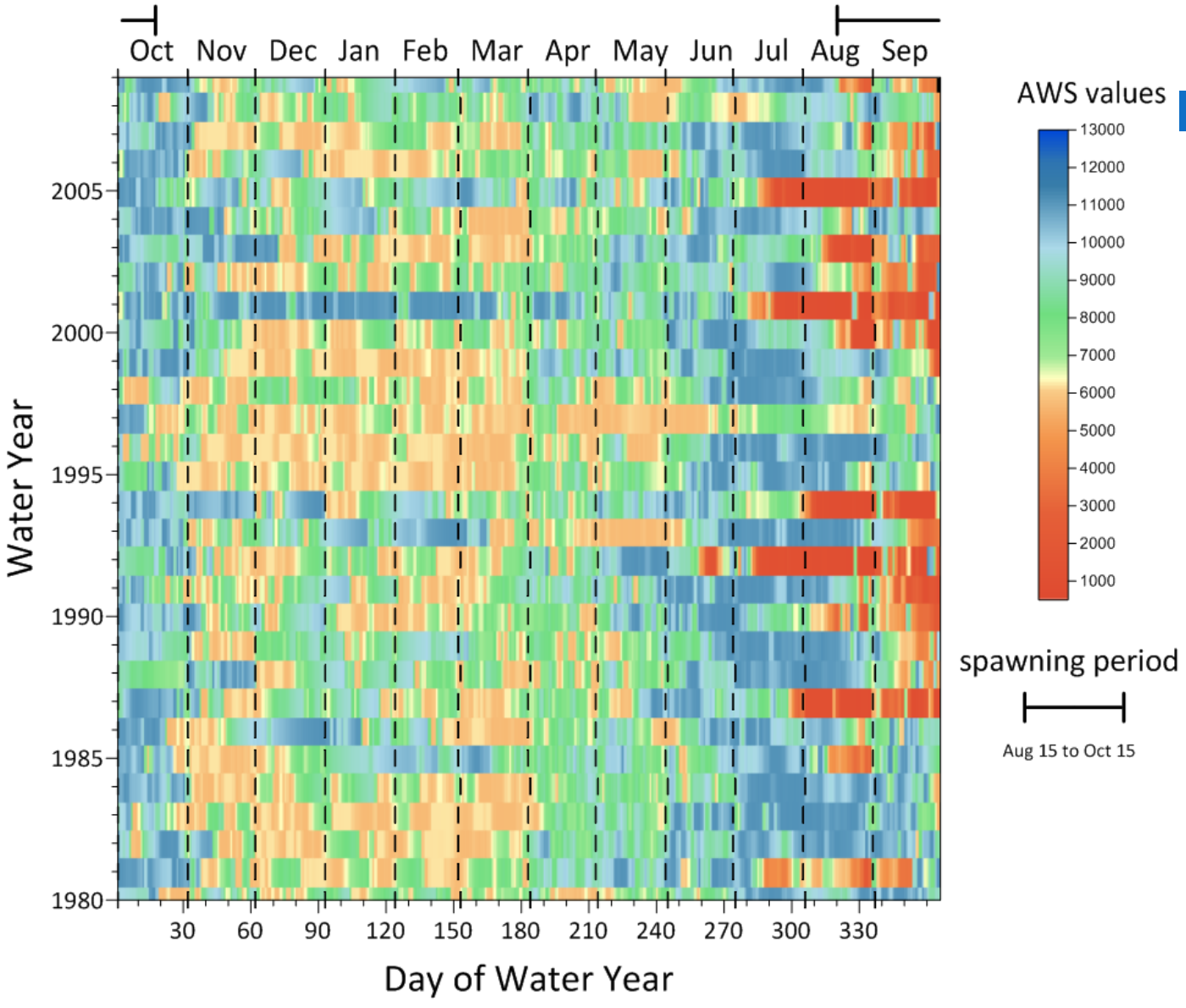
Upper East Fork Hood River, OR
Spawning Chinook Salmon AWS values
Historic Simulation (WY 1980 to 2009)

Historic/Existing (WY 1980-2010)



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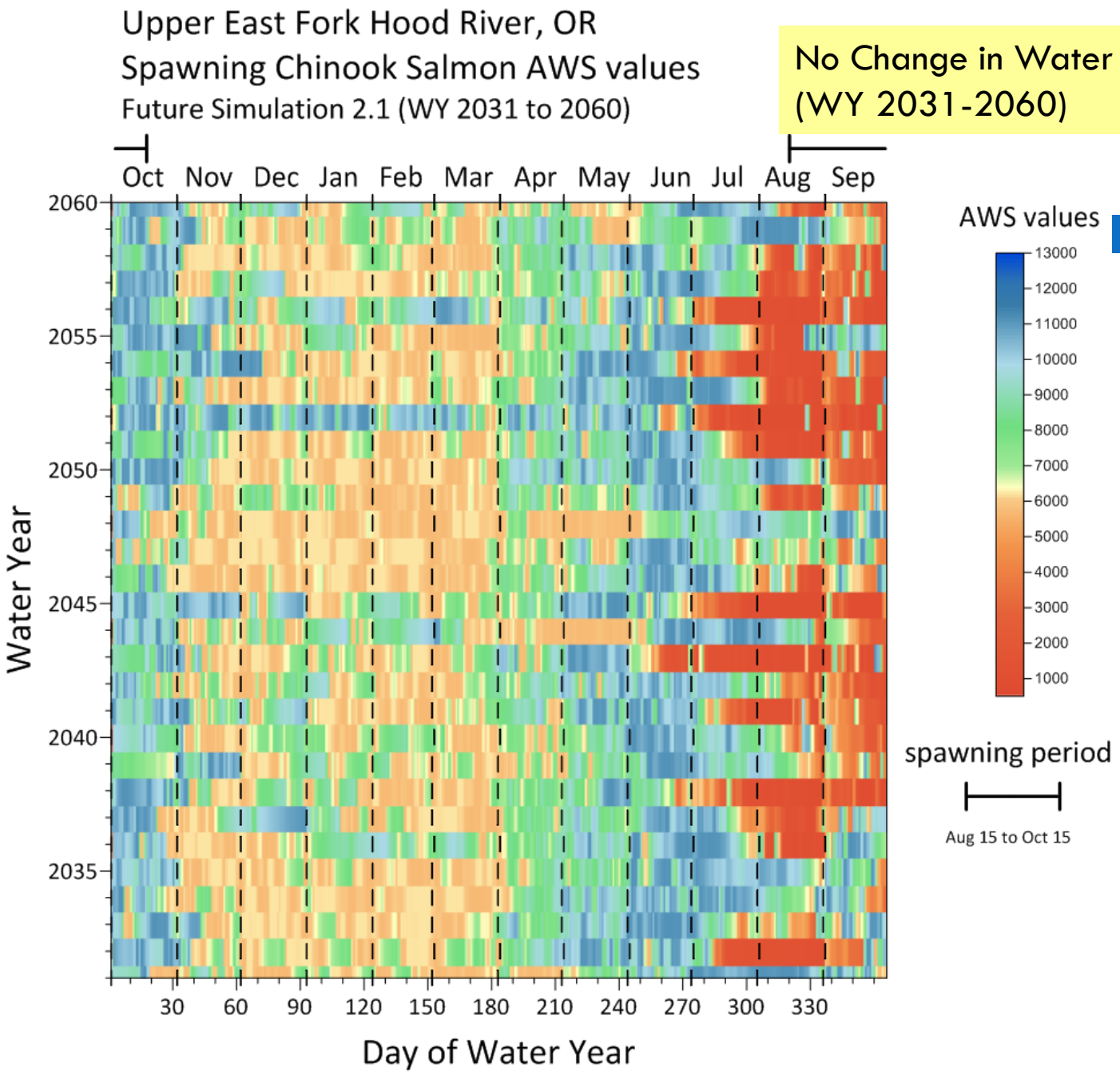
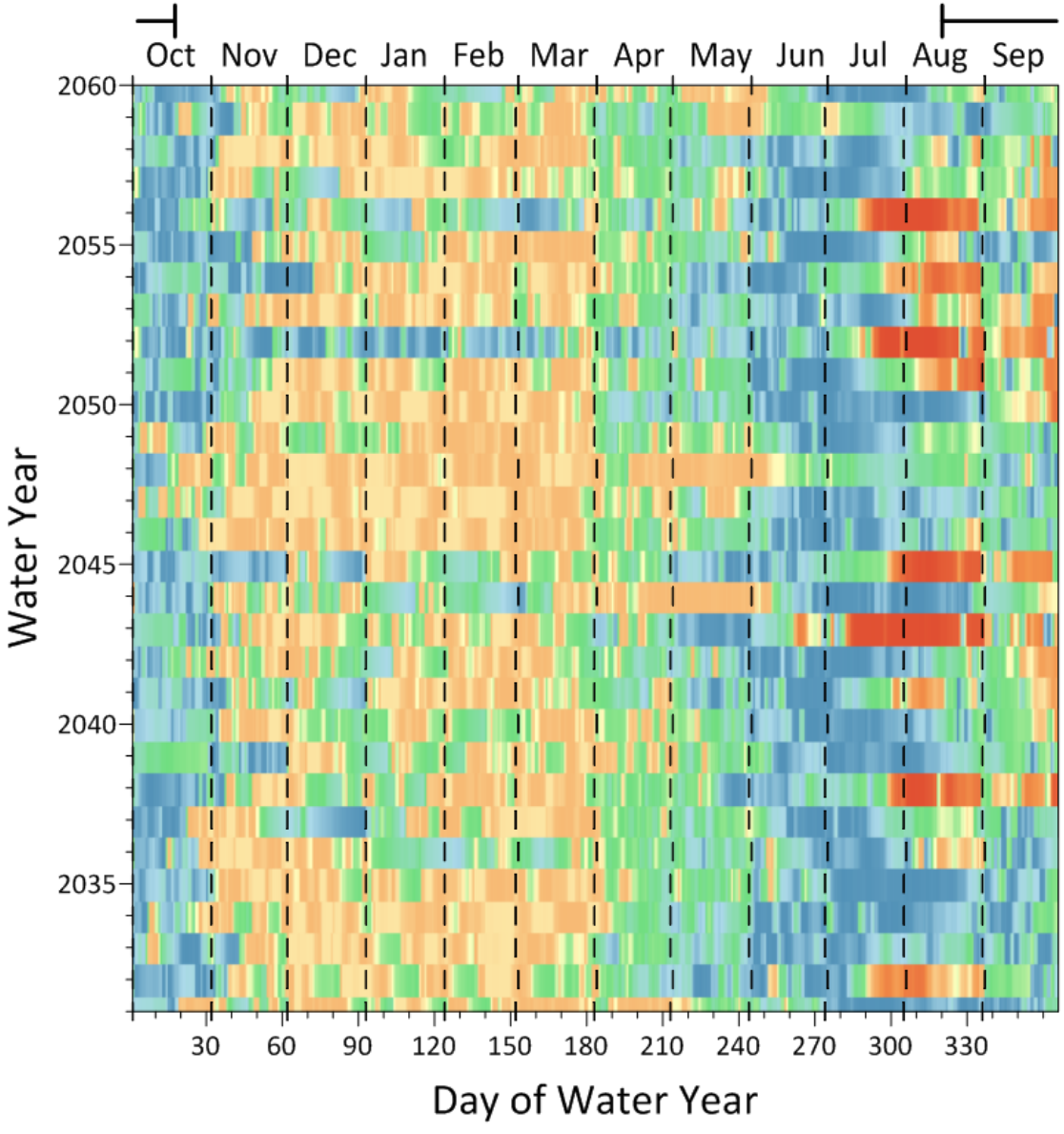


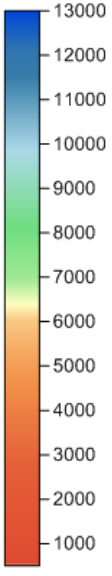
No Change in Water Use or Conservation (WY 2031-2060)

Upper East Fork Hood River, OR
Spawning Chinook Salmon AWS values
Future Simulation 4.1 (WY 2031 to 2060)

Conservation (WY 2031-2060)



AWS values



spawning period

Aug 15 to Oct 15

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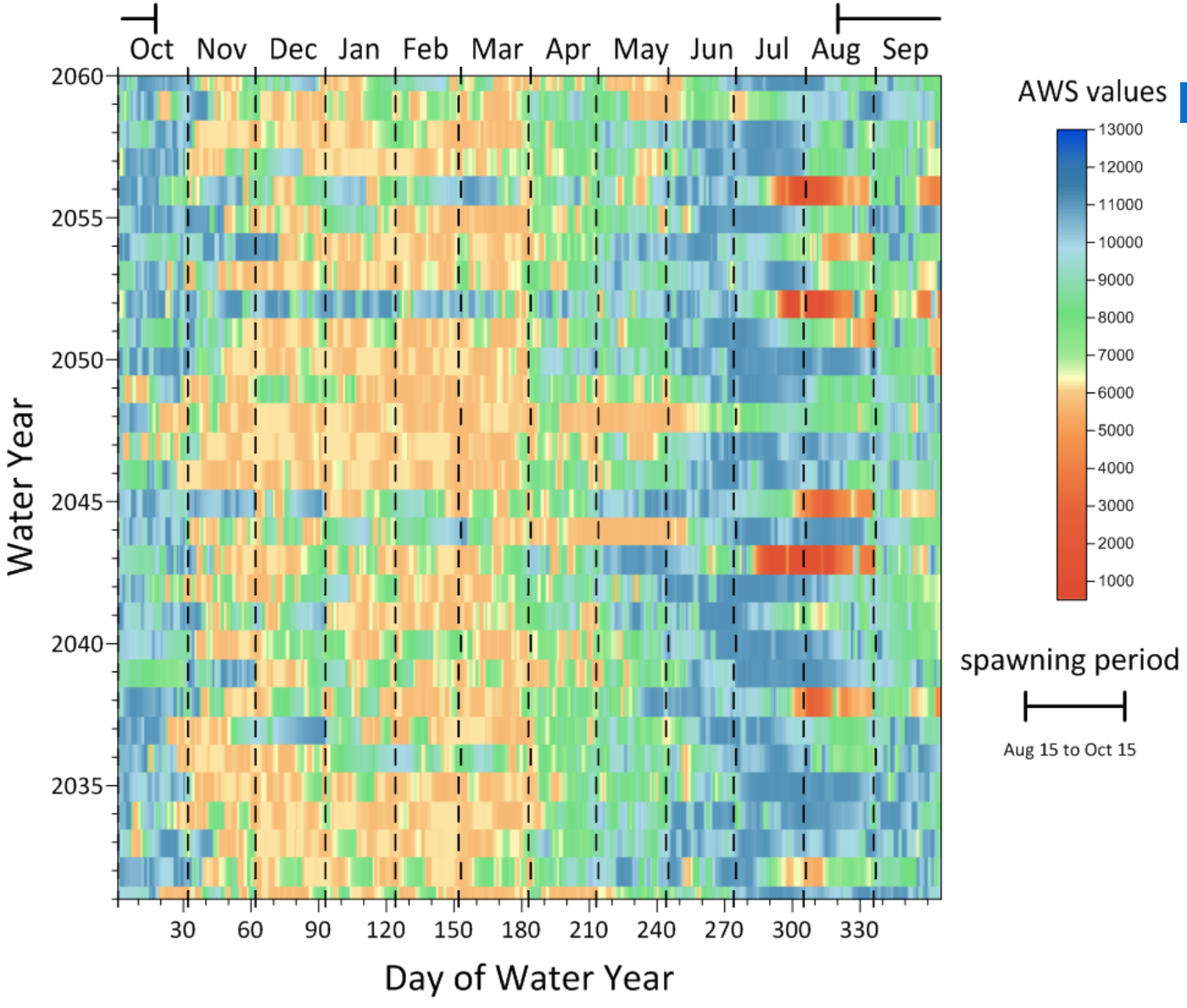
Upper East Fork Hood River, OR
Spawning Chinook Salmon AWS values
Future Simulation 5.1 (WY 2031 to 2060)

Conservation & Storage (WY 2031-2060)



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Improved Fish Habitat

Project Type		Water Savings or Gain	Total Cost	Cost/cfs
Pipe & pressurize remaining open canals or old distribution lines	37 miles	27 cfs	~$45 million	0.4 M
On-farm irrigation systems & management	10,000 acres	29 cfs	~$13 million	~1 M
New reservoir (East Fork ID)	2,560 ac-ft	14 cfs	~$20 million	~1.4 M
Expand existing reservoirs	4.5 ac-ft	4.3 cfs	~2 million	~0.4 M

Acknowledgements

- Les Perkins, Mike Benedict, Mattie Bossler, Hood River County
- Bureau of Reclamation
- Terrence Conlon, USGS
- Bob Wood & Josh Hackett, OWRD
- Niklas Christensen, Watershed Professionals Network
- Tom Gast, Normandeau & Associates
- Chris Brun, Confederated Tribes of the Warm Springs
- Tim Hardin & Rod French, ODFW
- Craig DeHart, Middle Fork Irrigation District
- Jer Camarata, Farmers Irrigation District
- John Buckley, East Fork Irrigation District
- Hugh McMahon & Jason Keller, Watershed Residents