Hood River Water Conservation Strategy:

achieving long-term water resource reliability for agriculture & local fish populations

Cindy Thieman
Hood River Watershed Group

Ed Salminen & Niklas Christensen
Watershed Professionals Network

Hood River Water Conservation Planning

Elements: Analysis of water supply & demand, streamflow impacts from predicted climate change, water conservation potential, and effects on salmon & steelhead habitat

Partners: Hood River County, Irrigation Districts, Confederated Tribes of the Warms Springs, Hood River Watershed Group, ODFW, DEQ, OWRD

Grants: **U. S. Bureau of Reclamation- Basin Study** grant ($250,000 in-kind work from Reclamation) and **WaterSMART** grant ($100,000 cash for final water conservation planning and outreach)

Oregon Water Resource Department- $250,000 cash for Water Use Assessment, Water Conservation Assessment, IFIM study

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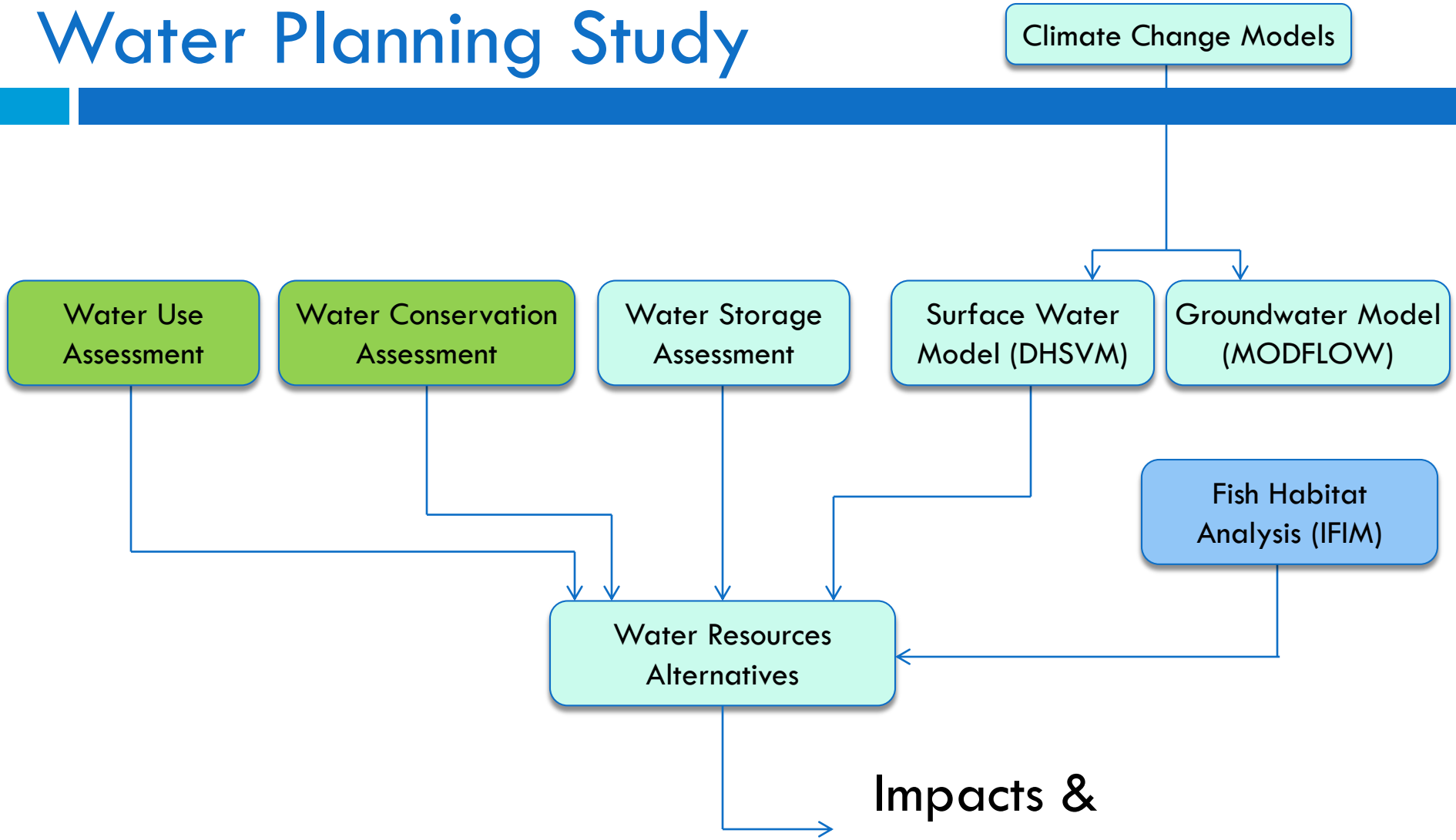
Overview of Water Planning Study



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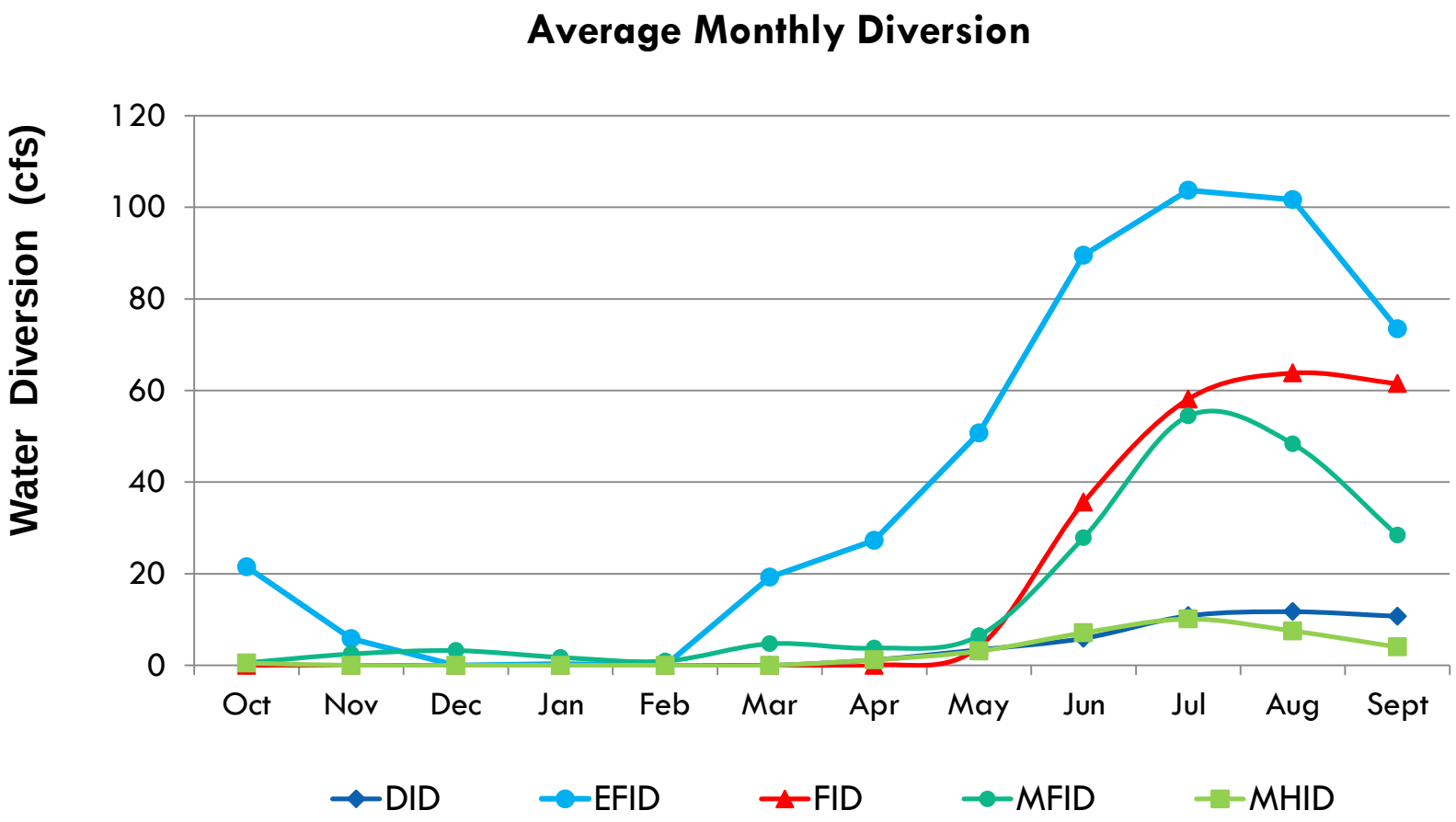
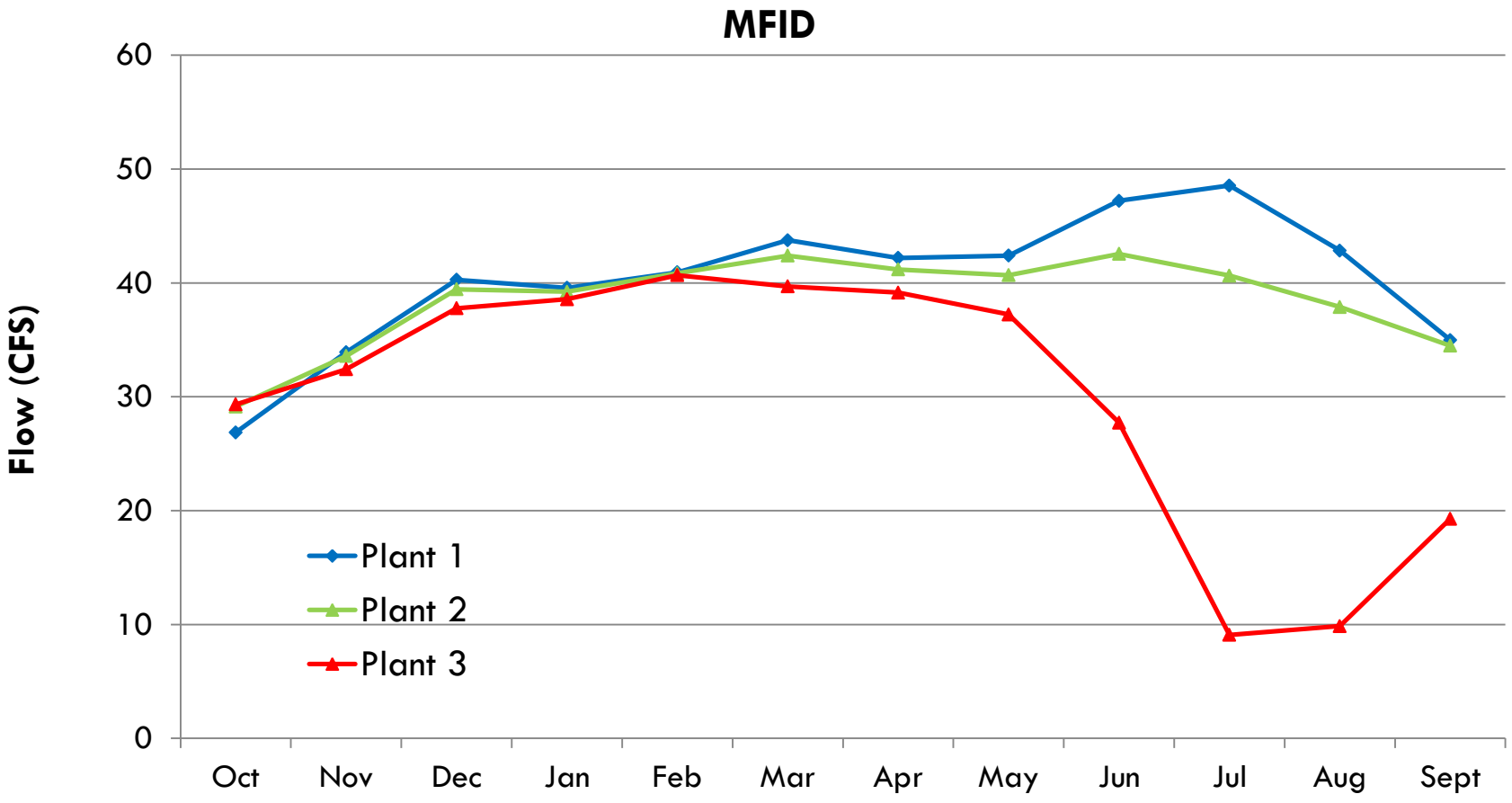
Water Use - Irrigation



Water Use - Hydropower



Water Use - Instream

Threatened Species:

-Spring & fall Chinook

-Winter & summer steelhead

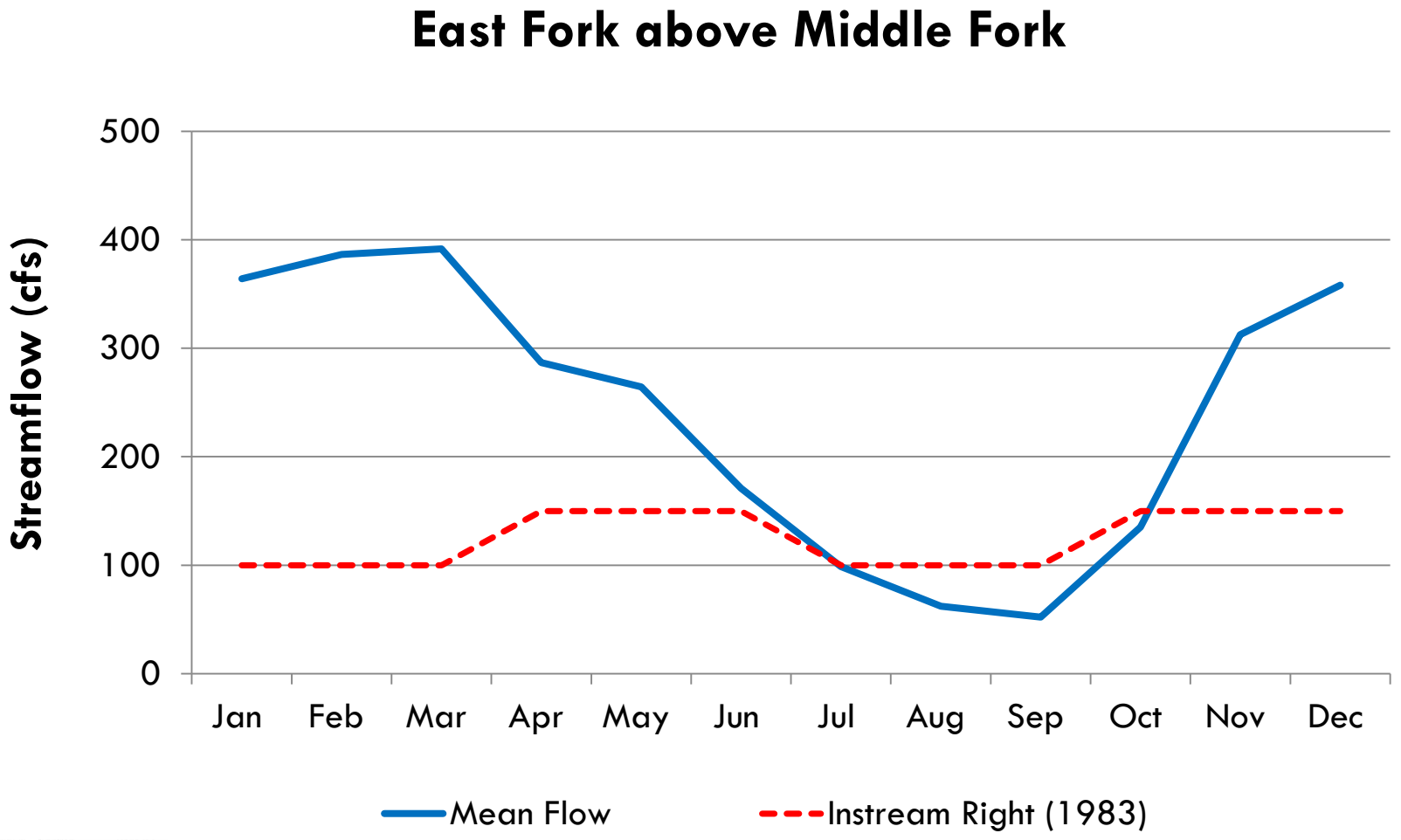
-Coho

-Bull trout

Key Limiting Factors:

-Summer flows

Water Use - Instream



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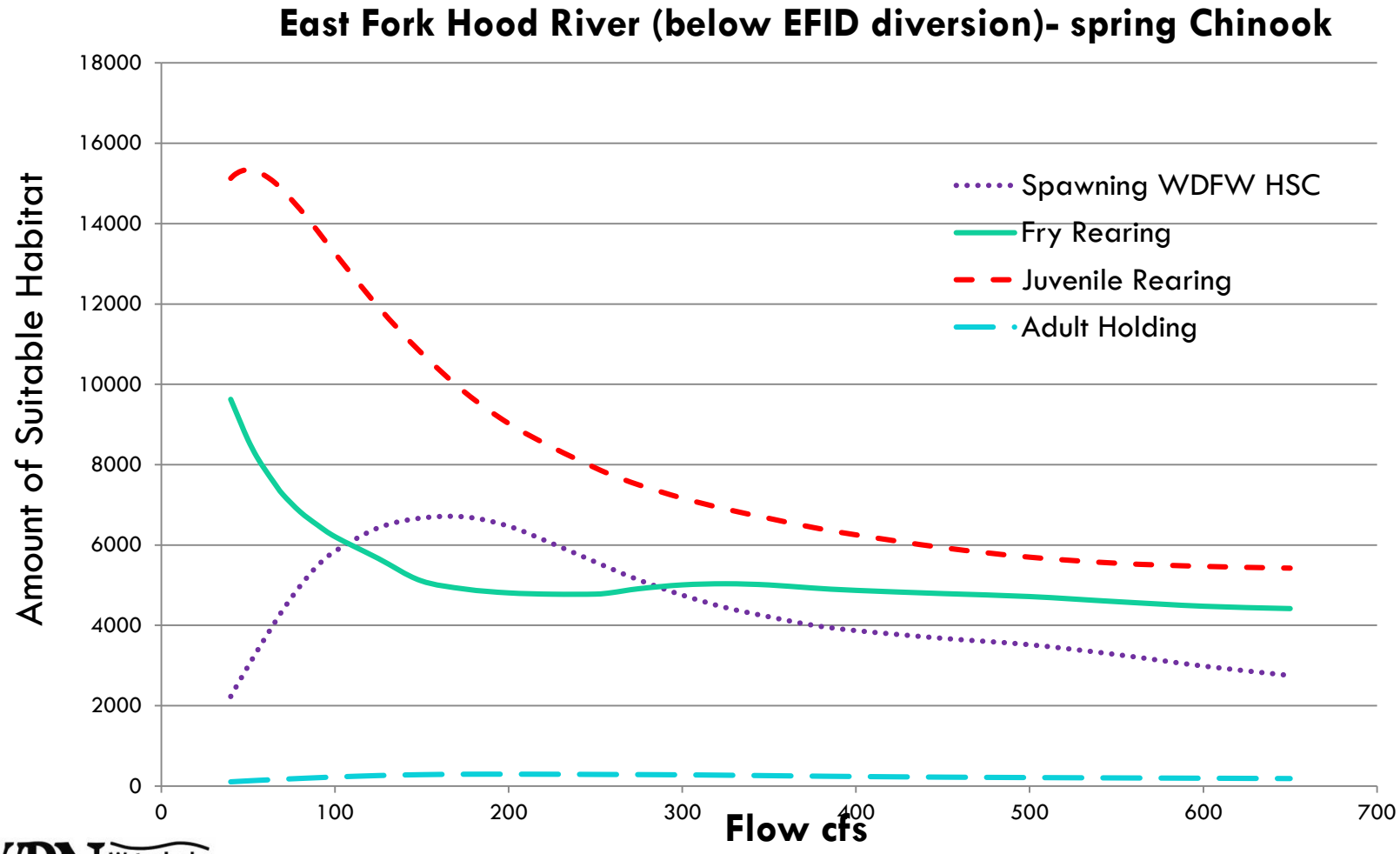
Water Use - Instream



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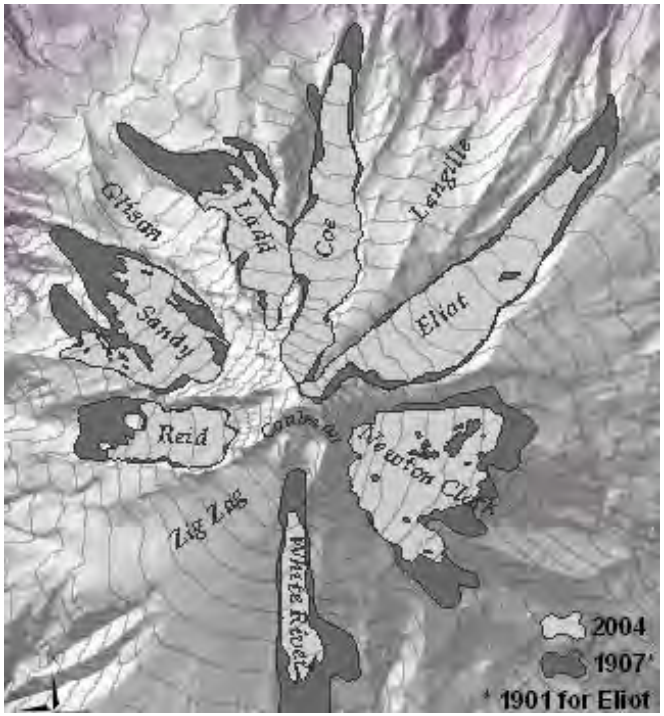
Climate & Future Water Management

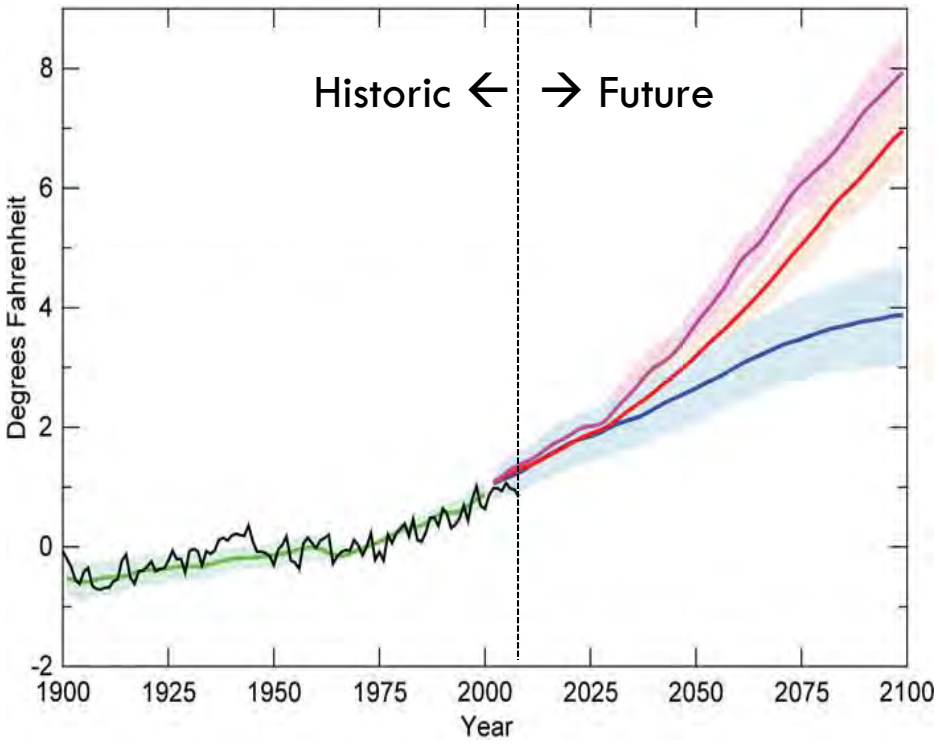
- How is climate predicted to change in Hood River County? (Modeling for 2030 – 2060)
- How will water availability for irrigation be affected?
- What are the alternatives?
- What will fish habitat availability look like under these alternatives?

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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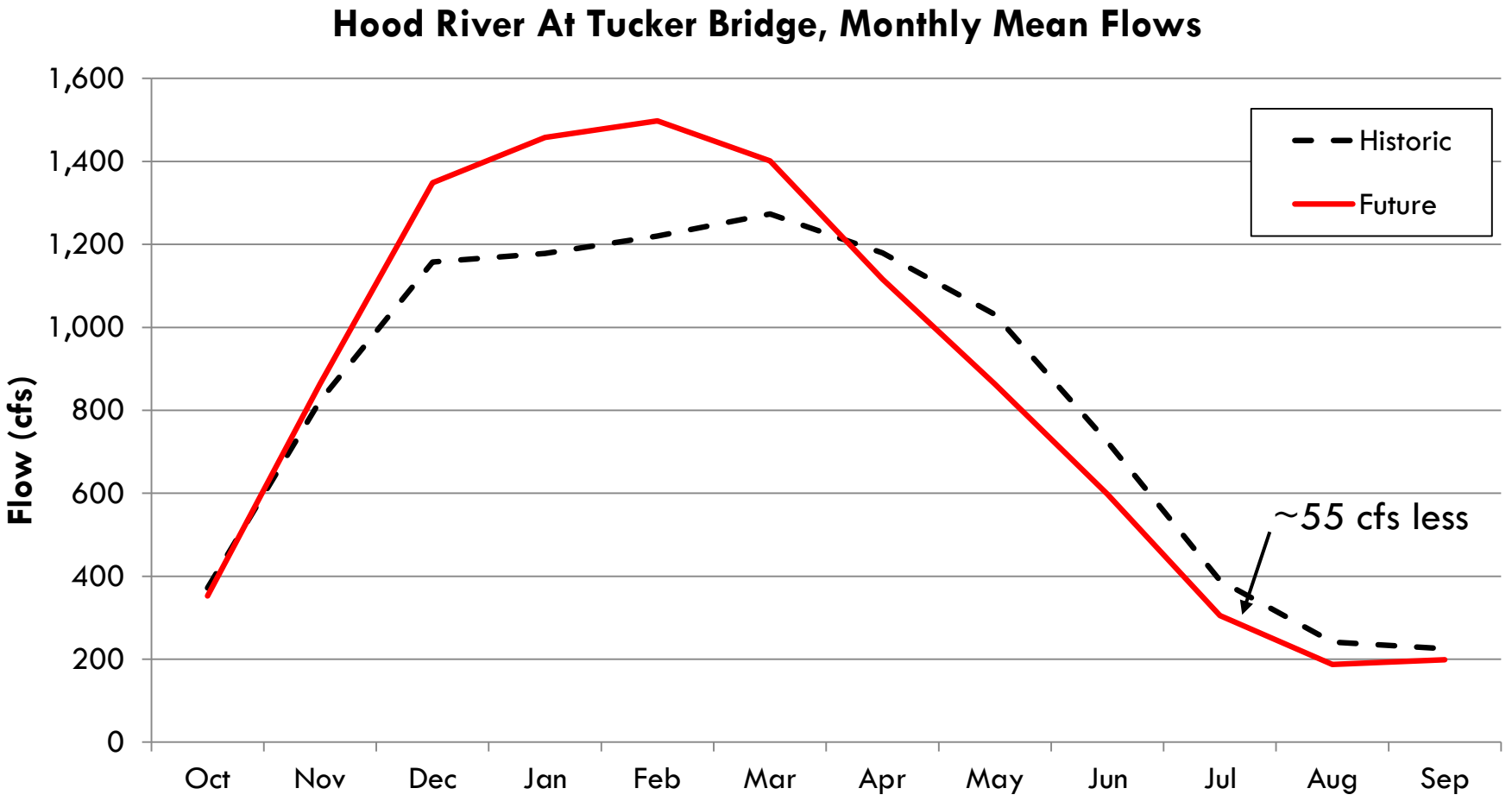
Streamflow (average)



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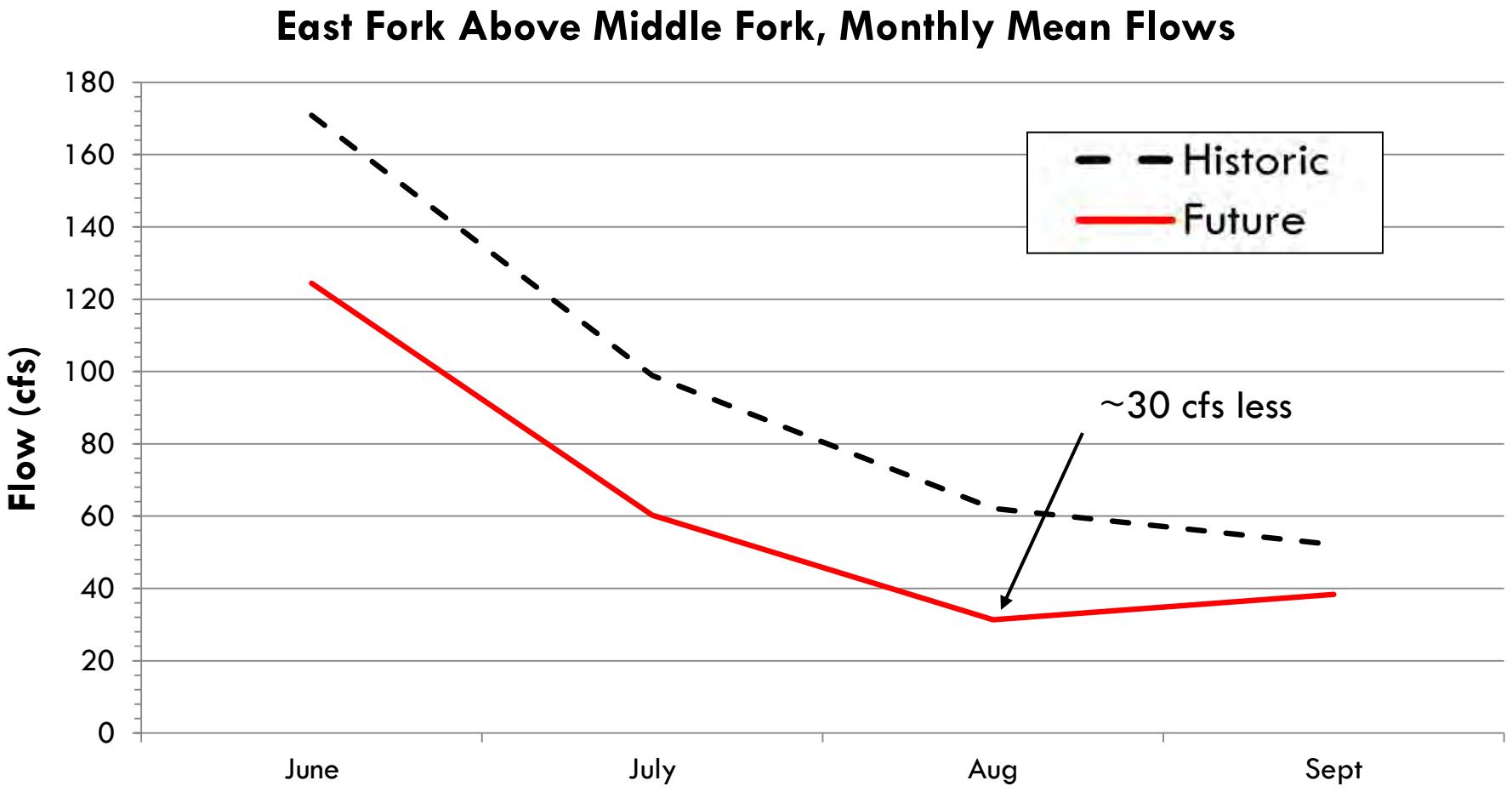
Streamflow



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Options to Increase Water Availability

- Using more Groundwater (currently evaluating potential impact & recharge possibilities)
- Increasing Reservoir Storage
- Potable Water Conservation (comparatively low impact)
- Irrigation Water Conservation – conveyance, on-farm, fallowing of annual crops
- Hydropower- reduce summer diversions, off-set with winter diversions

Water Conservation - Irrigation

Impact sprinklers on handline

→

Solid set micro sprinkler

Open canal

→

New pipe project

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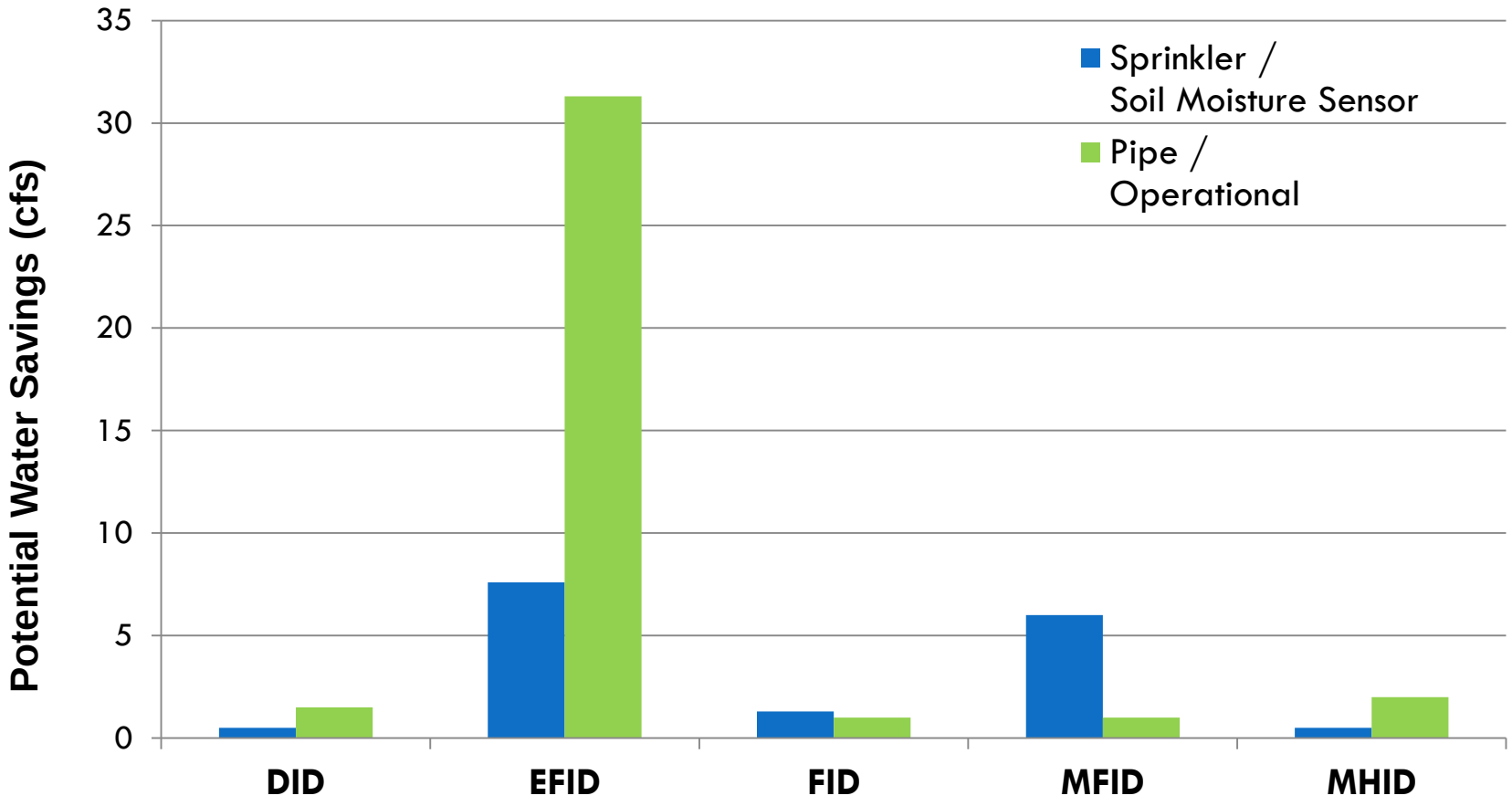
Water Conservation – Irrigation



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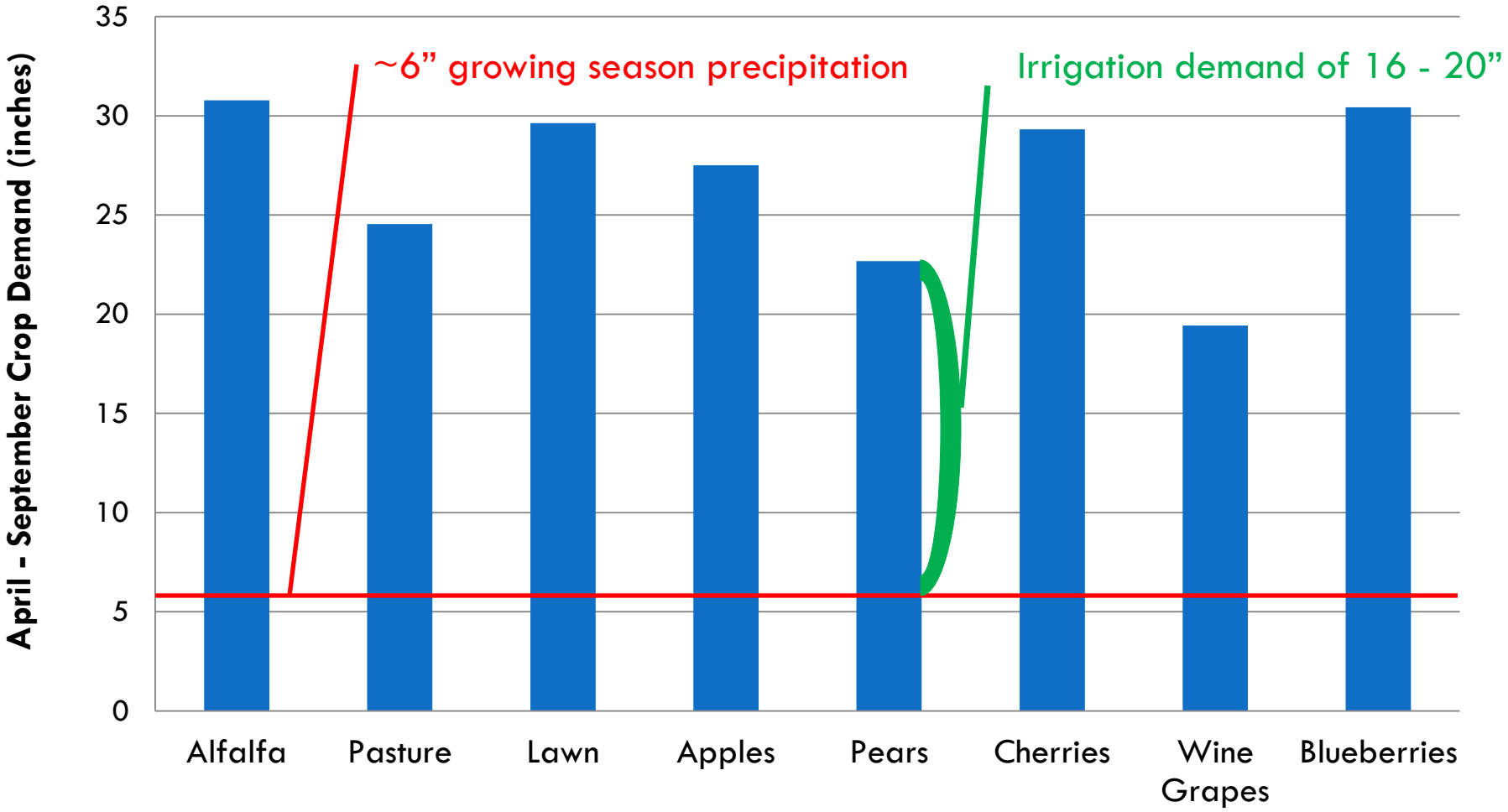
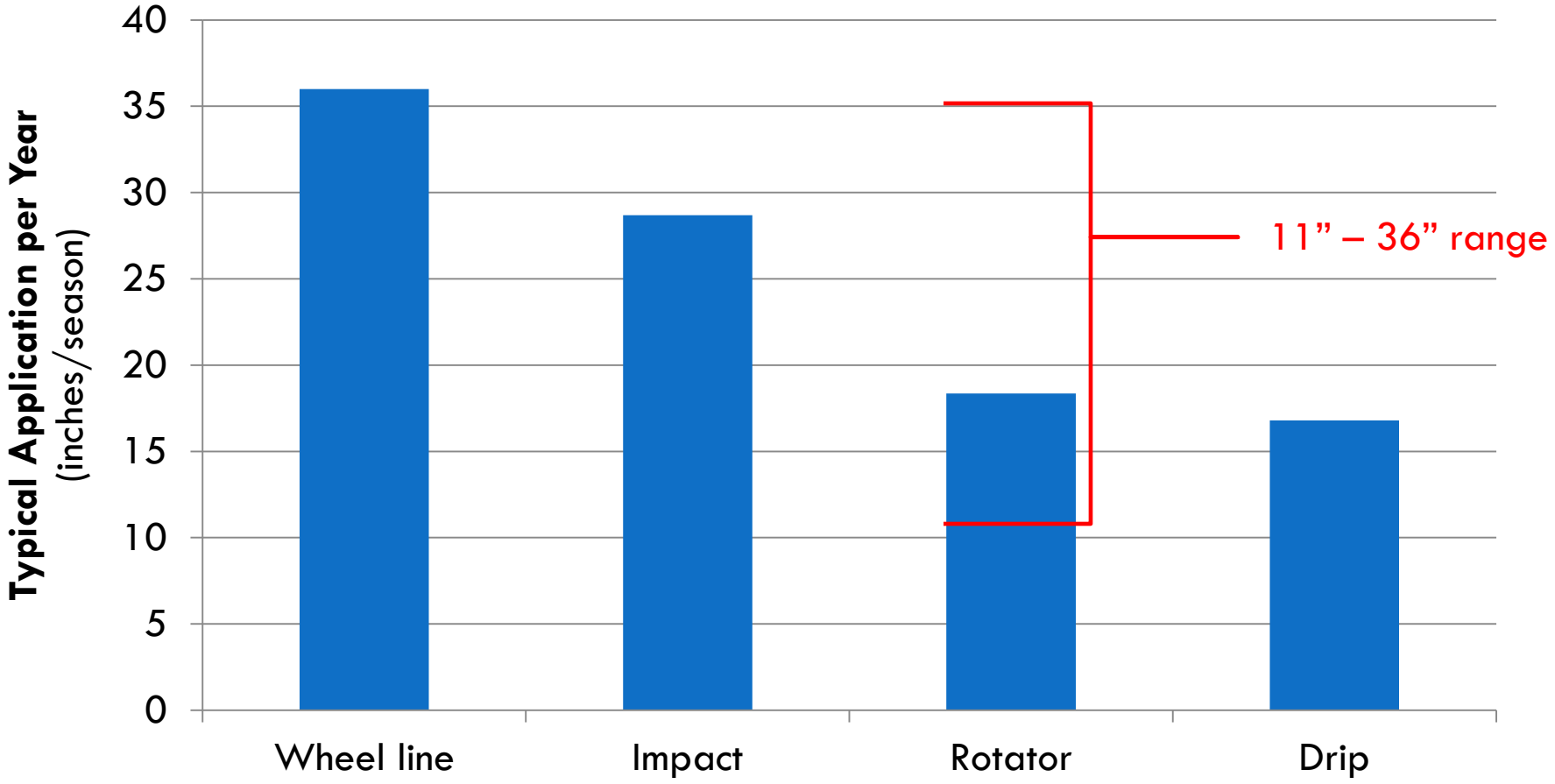
Average Crop Demand (AgriMet)



Water Use of Different Application Methods



Effects of Sub-optimal Irrigation Practices

- Poor crop performance due to insufficient or uneven application of water (*Ex. application rate exceeds absorption rate of soil, some trees get too much, some not enough*)
- Leaching fertilizer out of root zone; washes into ground water or surface water- waste of money
- Surface runoff leads to soil erosion on slopes
- Higher labor cost

Benefits of Improved Irrigation Practices

- Optimize fruit yield and quality *(reduce incidence of cork spot & alfalfa greening in pears)*
- Optimize canopy development and efficiency: avoid excessive shade, promote return bloom & fruit set
- Optimize inputs & minimize costs *(nitrogen, water, pruning)*
- Ability to adequately water in a low-water year- maintain fruit size and profit margin

Improving Irrigation Management

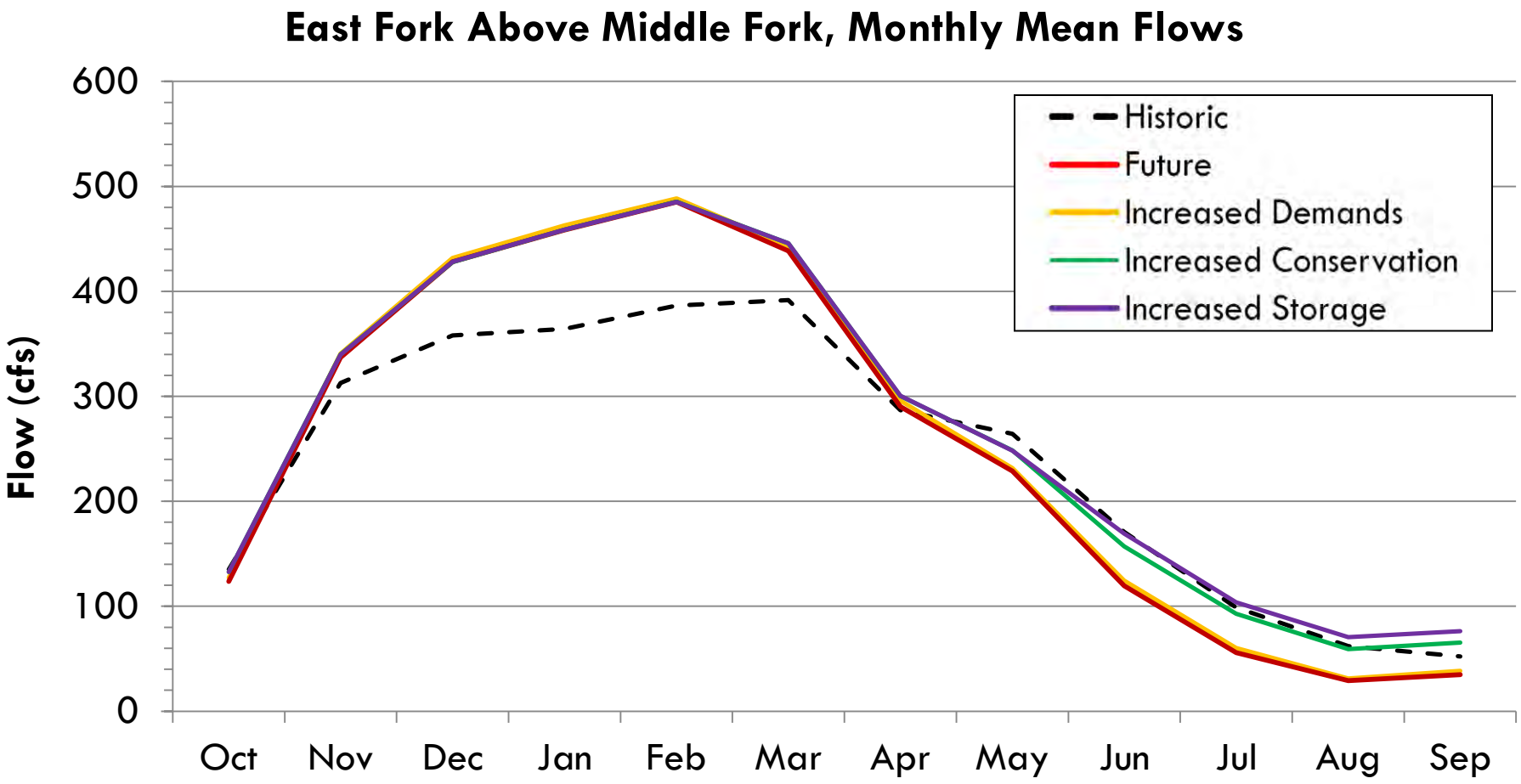
- Design and maintain irrigation systems for uniform and efficient watering

- Use soil moisture monitoring and evapotranspiration estimates to optimize water availability to crops (*Match irrigation application to crop demand*)

Future Management Scenarios under Median Climate Change

- "Historic": Reflects current management practices, infrastructure, and average stream flows (1980- 2010)
- "Future": Climate change but no management, infrastructural, or demand changes
- "Increased Demand": Climate change + increased demand
- "Increased Conservation": Climate change + increased demand + increased conservation
- "Increase Storage": Climate change + increased demand + increased conservation + increased storage

Impacts from Alternatives in an Average Year



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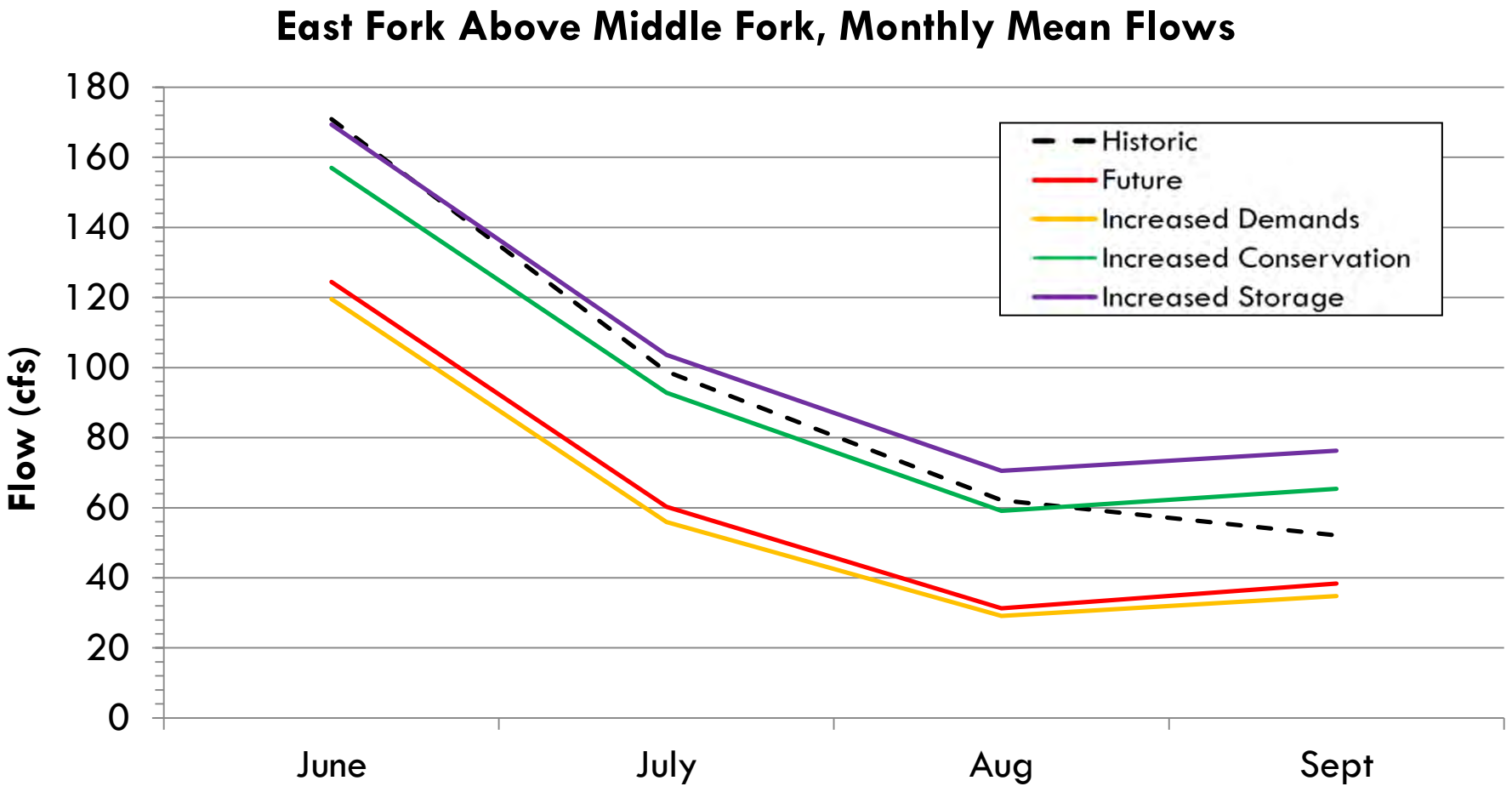
Impacts from Alternatives in an Average Year



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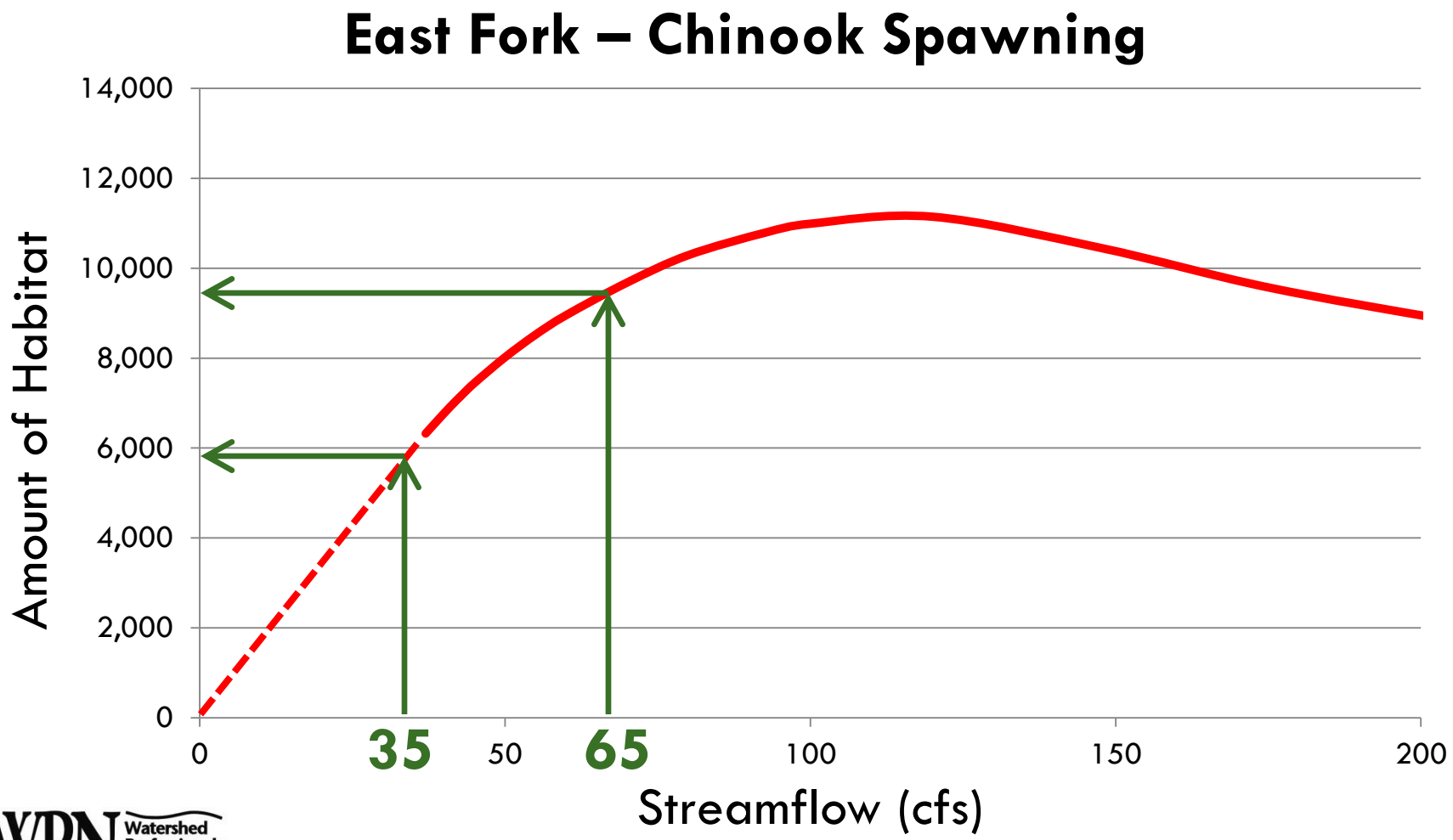
Improved Fish Habitat



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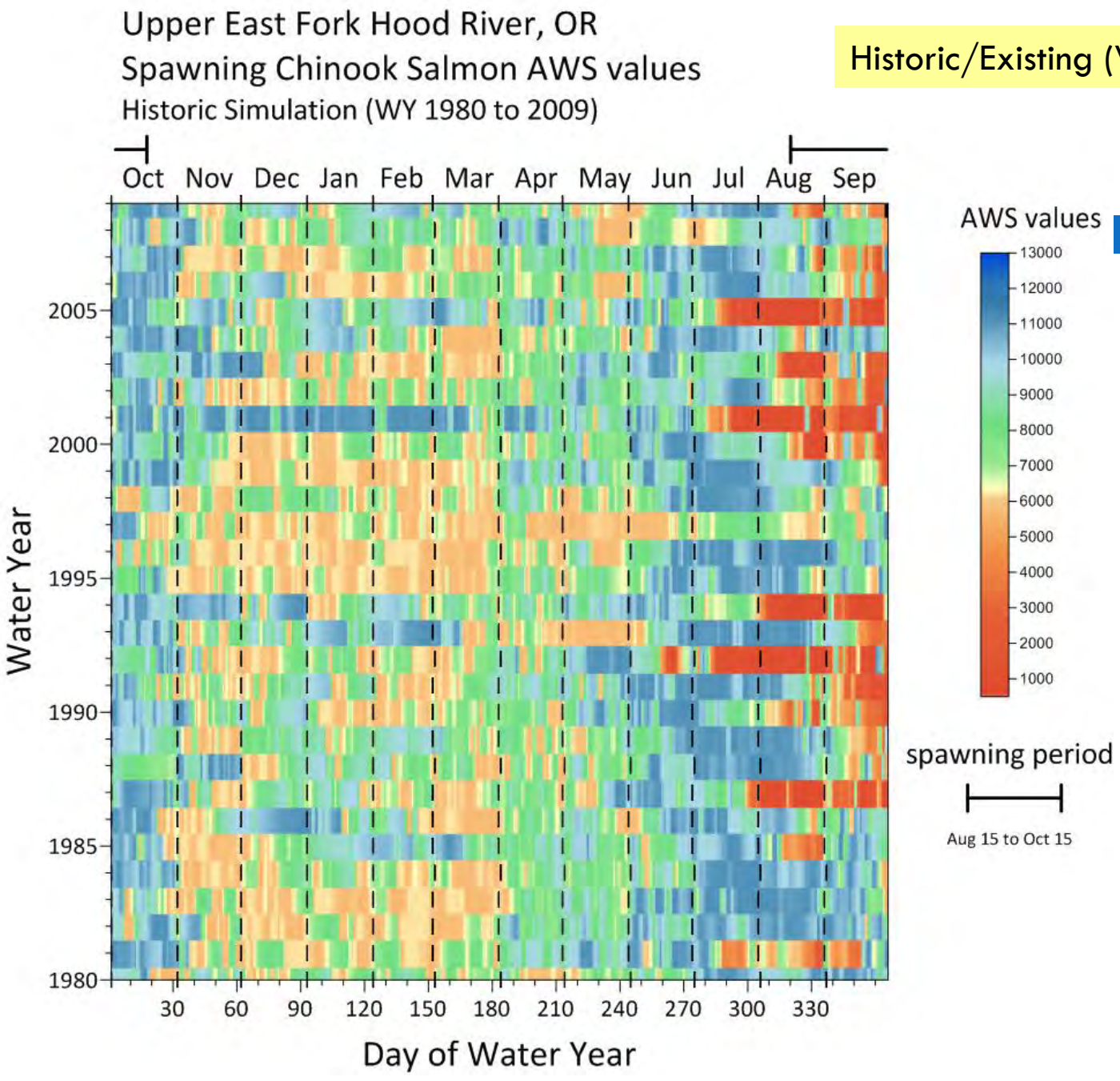
Historic/Existing (WY 1980-2010)



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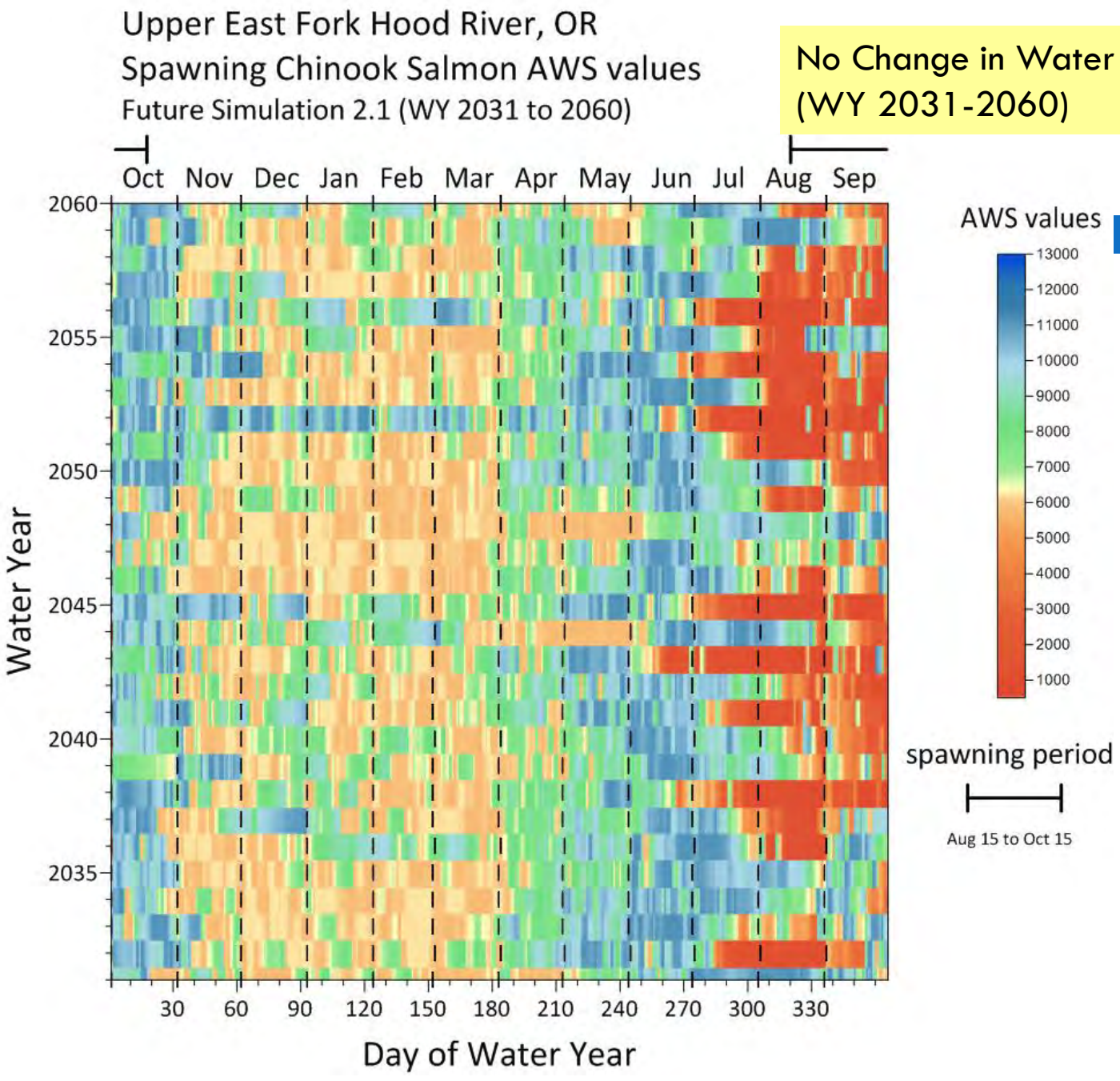

No Change in Water Use or Conservation (WY 2031-2060)

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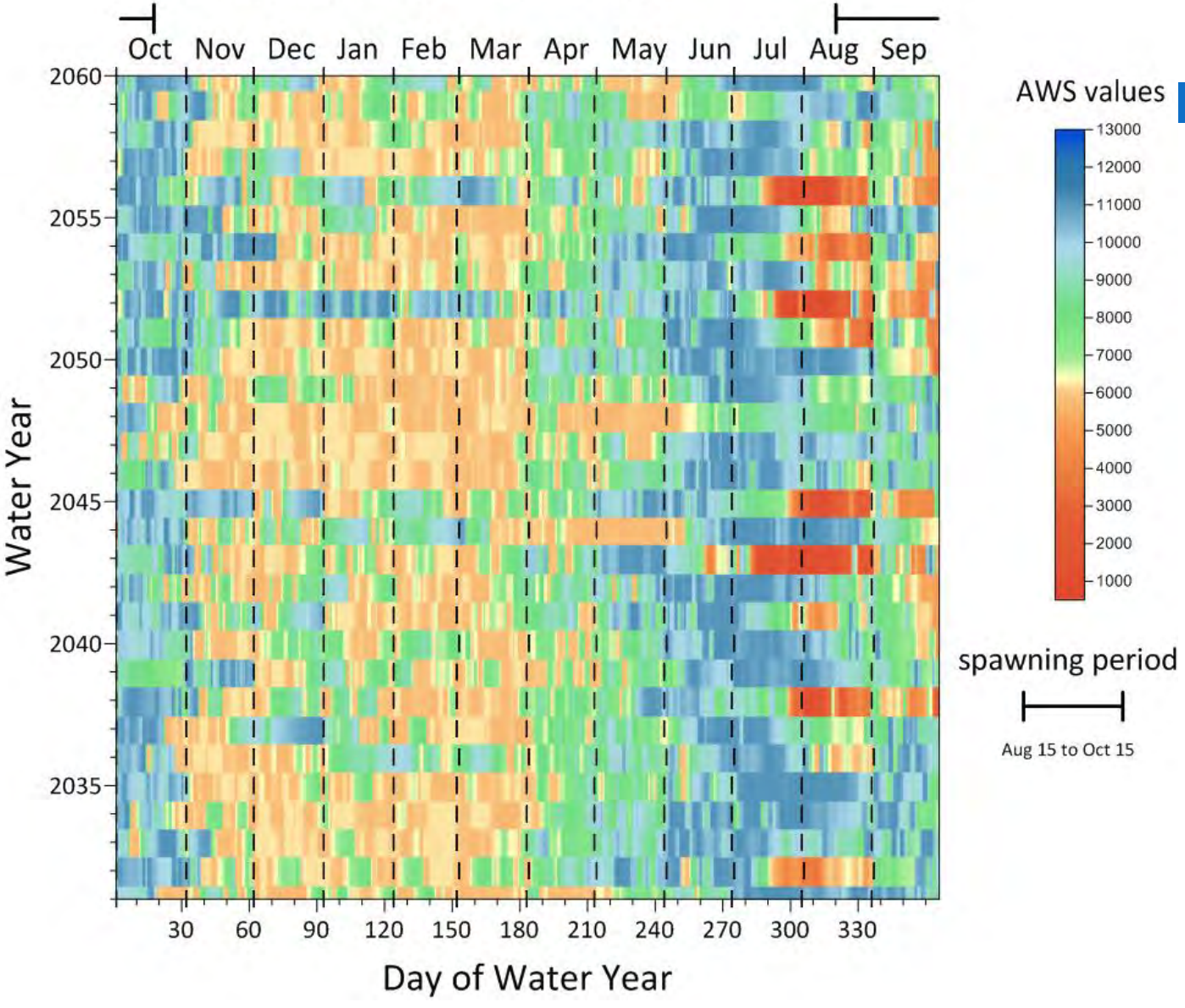
Upper East Fork Hood River, OR
Spawning Chinook Salmon AWS values
Future Simulation 4.1 (WY 2031 to 2060)

Conservation (WY 2031-2060)



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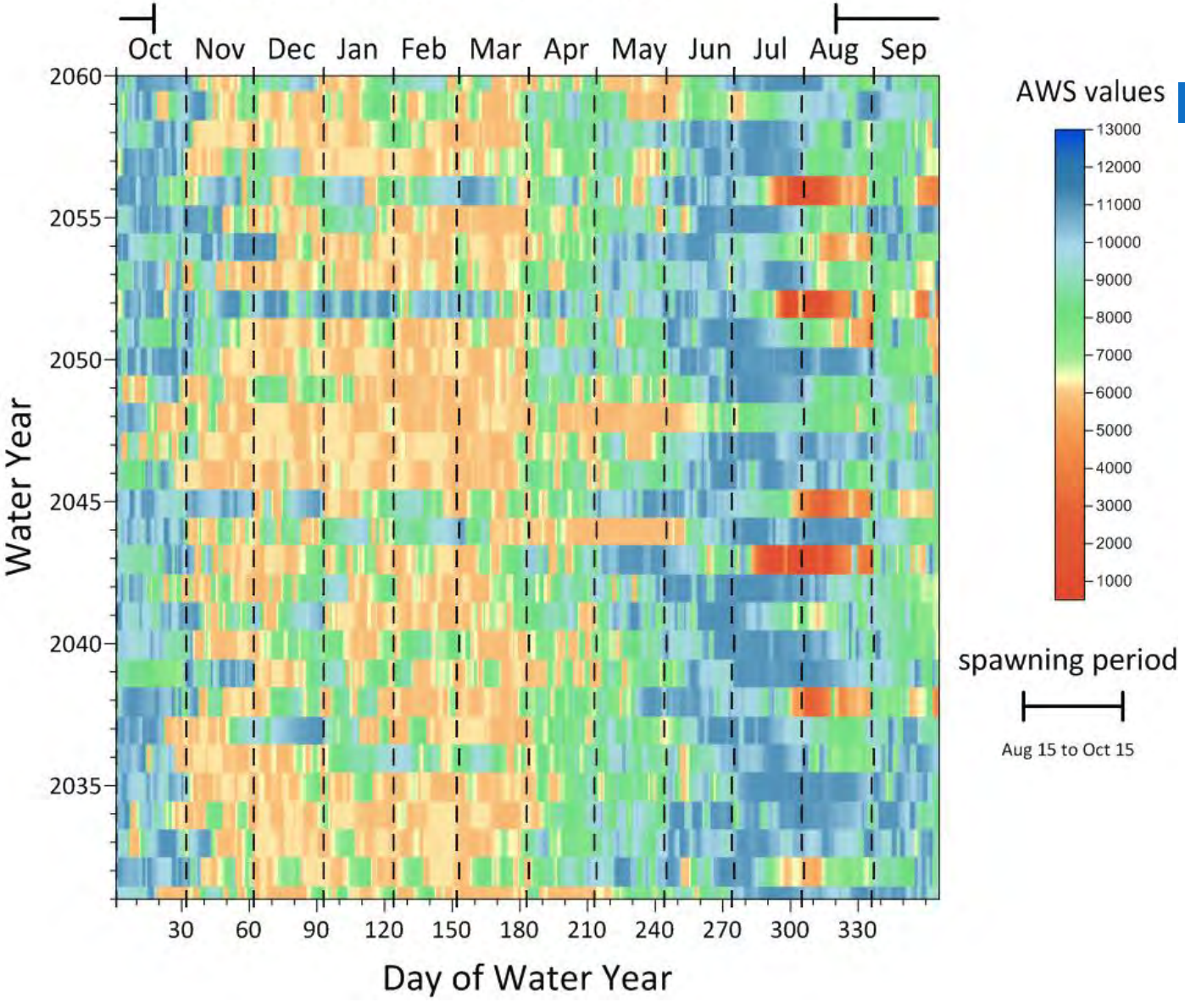
Upper East Fork Hood River, OR
Spawning Chinook Salmon AWS values
Future Simulation 5.1 (WY 2031 to 2060)

Conservation & Storage (WY 2031-2060)



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Basin Water Conservation Potential

Actions	Total Potential Savings	Most likely in next 20 years	Cost per CFS	"Next 20 years" cost
On-farm irrigation: sprinkler upgrades, soil moisture monitoring	32 cfs	26 cfs	$ 0.4 M/cfs	$10.4 million
Conveyance system upgrades (main & distribution lines)	27 cfs	27 cfs	$ 1 – 1.3 M/cfs	$35 million
Expanded water storage in existing reservoirs	4 cfs	4 cfs	$0.2-0.6 M/cfs	~$2.4 million
New water storage	22 cfs		$1.4 M/cfs	
Hydropower rebalancing	13 cfs (varies)	13 cfs	$0	$0
Voluntary fallowing of annual crops/pastures (Waterbank)	Up to 17 cfs	8 cfs	$50 K/cfs (dry years)	$400,000/yr (dry years)
	115 cfs	**76 cfs**		$47.8 million*

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Next Steps

- **Continue to Explore Innovative Ways to Increase Water Availability**
  - Water Bank- mechanism for temporary leasing of water rights
  - Shallow Ground Water Recharge-need to conduct feasibility study
- **Fund Raising**
  - State & Regional funding sources: 4 local irrigation districts recently applied for approximately $7 million from OWRD for distribution piping & reservoir expansion
  - Environmental Quality Incentives Program (NRCS): federal $ can cover 50% of on-farm irrigation upgrades; OWEB small grants
  - Local sources? (Example- MFID has a cost-share program)