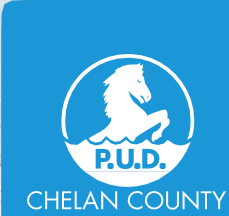


CHELAN PUD CLIMATE CHANGE FORECAST

TRI Commission meeting



Shaun Seaman

June 5, 2018

Today's Presentation

Overview of District efforts to understand possible impacts of climate change

Climate Change Forecast

- » Discuss impacted areas of interest

- » Preliminary analysis

Climate Change Vulnerability Assessments

Potential Impact Areas

I. Columbia River mainstem

- a. Power generation
- b. Aquatic resources
- c. Water quality

II. Lake Chelan Basin

- a. Chelan Powerhouse generation
- b. Lake level management
- c. Chelan River flows

III. Wenatchee and Methow rivers

- a. HCP hatchery program

IV. Distribution system load





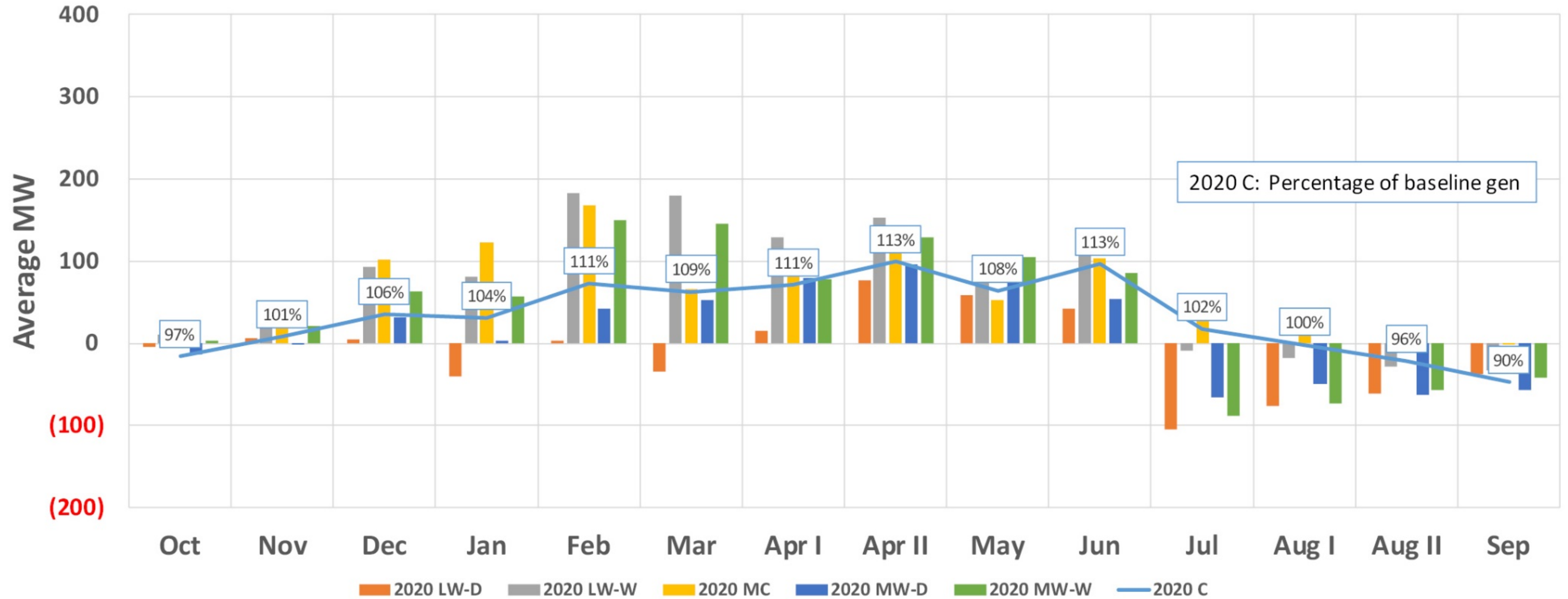
Columbia River Flows

River Management Joint Operating Committee (RMJOC)

- » Leading the effort for mainstem
- » Identified 22 scenarios to produce regulated stream flows
- » Stream flow data expected this November

Chelan will use the data to analyze impacts to our Columbia river operations

2020's: Change in Rocky Reach Gen with Climate Change Scenarios



■ LW-D Less Warming and Drier	■ LW-W Less Warming and Wetter	■ MC Minimal Change	■ MW-D More Warming and Drier	■ MW-W More Warming and Wetter	— C Central
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An aerial photograph of a lake basin, likely Lake Chelan, showing a large body of water in the foreground, a town with houses and roads along the shoreline, and rolling hills in the background under a clear sky. The image is split vertically, with the left side showing a closer view of the lake and the right side showing a wider view of the town and hills.

Lake Chelan Basin Power Generation and Lake level Management

Using current modeling tools

Power generation

- »Water available for generation

Lake level management

- »License requirements

- »Chelan River flows

Distribution system load

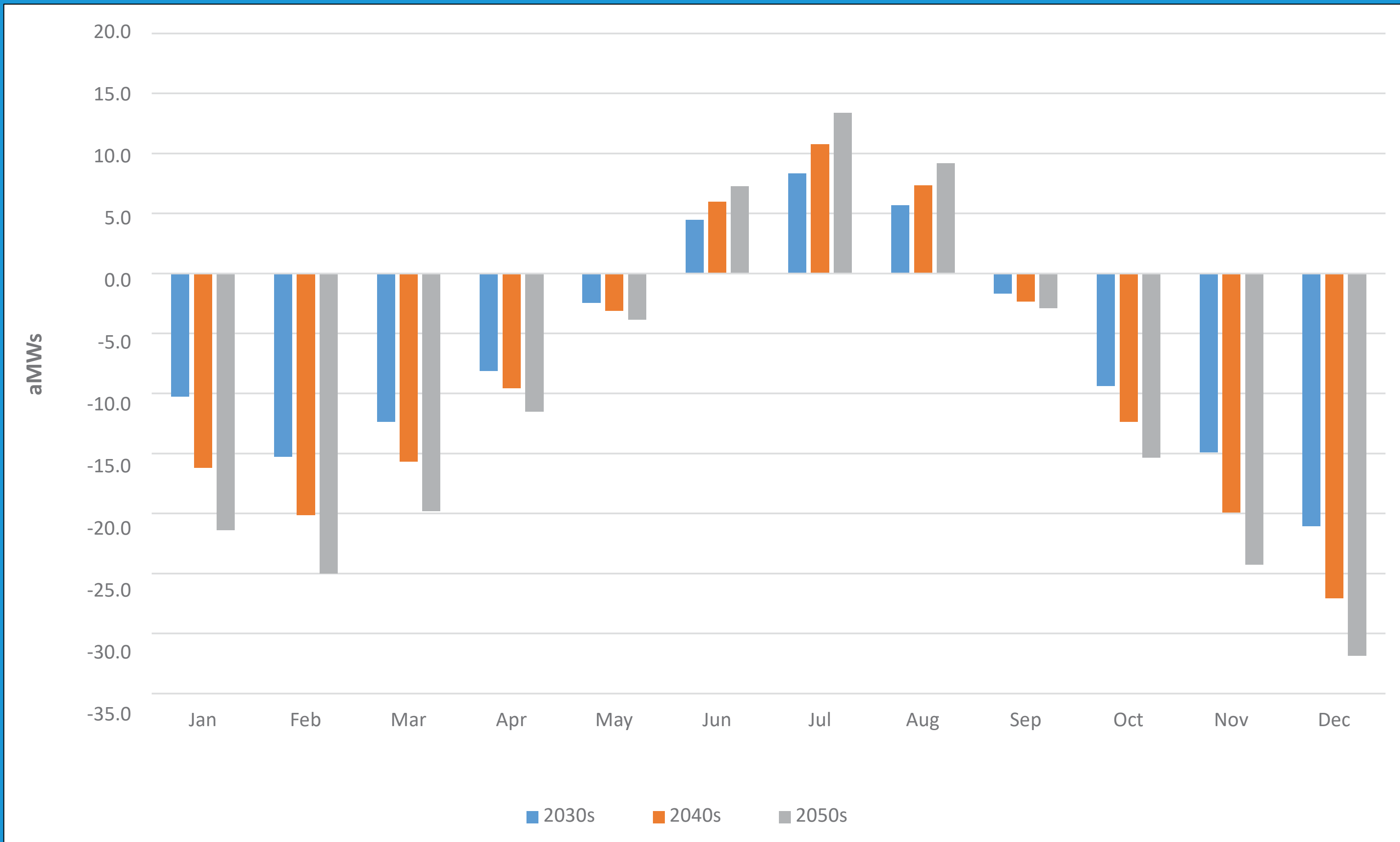
Average monthly temperatures forecasted to change

» Higher in both winter and summer

» Greater changes in winter temperatures






The forecast does not account for load growth

District-wide change in monthly demand (aMWs)



District Vulnerabilities Assessment

Table 2a. Maintain Highly Reliable and Cost Effective Electrical Distribution Infrastructure

District Vulnerabilities	Climatic Driver	Time Frame (Velocity) and Likelihood			Adaptation Response Strategies				
		0-3 years	3-10 years	10+ years	Regulatory Coordination	Research and Analysis	O&M Budget	Capital Budget	Stakeholder Coordination
A.1 Damage to or interference with infrastructure due to increased number of plant species and growth rate may require additional maintenance staff and cost in order to manage vegetation proactively. Currently vegetation inspection is on a 2 to 4 year cycle.		L	L	M		✓ ₁₂	✓		✓ ₁₃
A.2 Damage to infrastructure from fire may require additional emergency staff and cost in order to respond and repair/replace.		L	M	M		✓ ₁₄	✓	✓	
A.3 Damage to infrastructure from increased tree death due to disease and/or fire may require additional staff and cost in order to manage vegetation proactively.		L	L	M		✓	✓		
A.4 Changes in load shape during winter (i.e., reduction in typical winter peaking) could reduce operational pinch points and make additional power available.		L	L	L		✓	✓		
A.5 Increased precipitation may cause flooding and landslides that damage infrastructure, requiring additional emergency staff and cost in order to respond, repair, and replace.		M	M	M			✓	✓	



Next steps

Lake Chelan Modeling

Complete analysis by end of year

Vulnerability Assessments

» Deeper dive into the priority vulnerabilities as needed

Annual review and updates