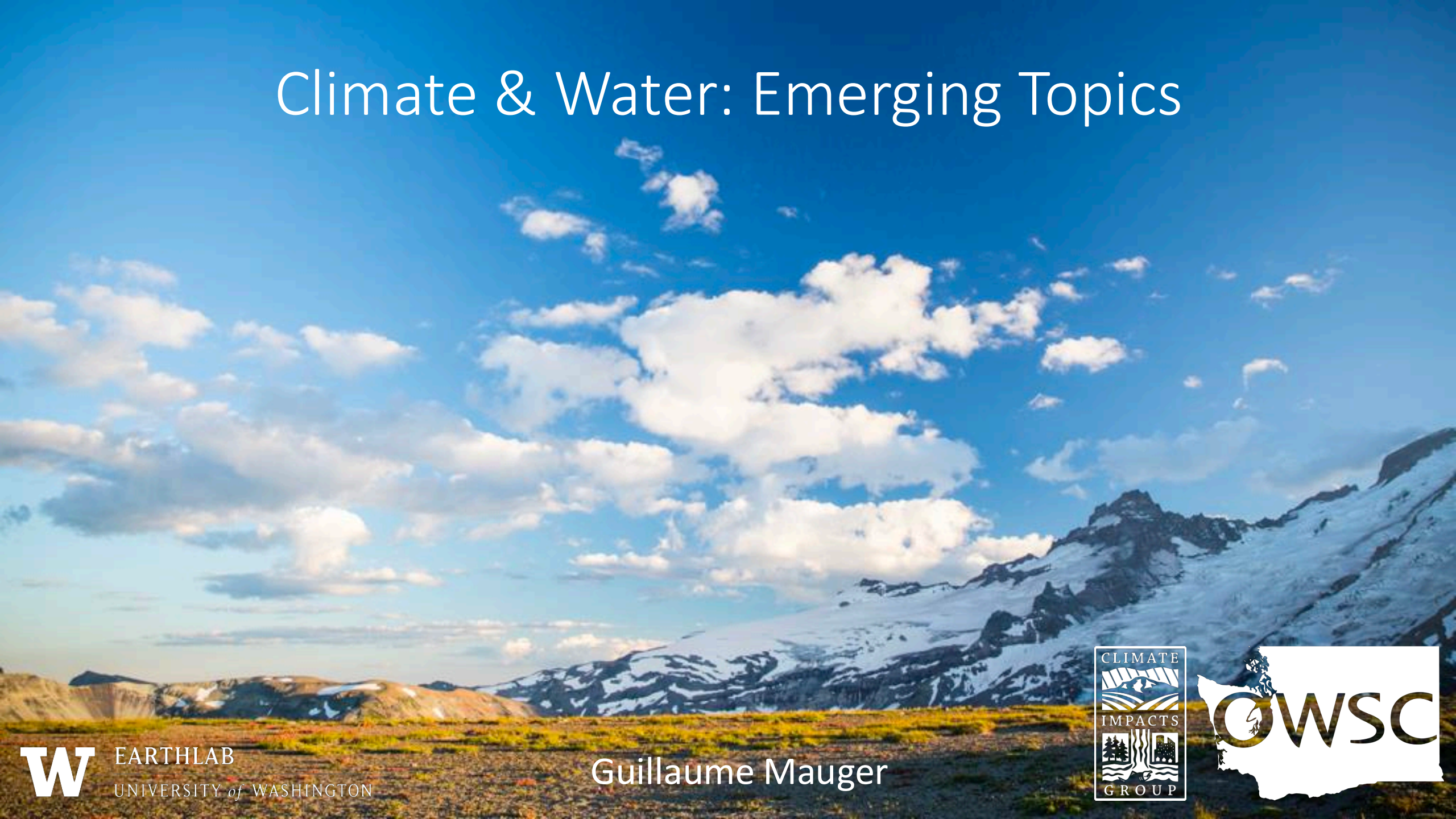


# Climate & Water: Emerging Topics



EARTHLAB  
UNIVERSITY of WASHINGTON

Guillaume Mauger

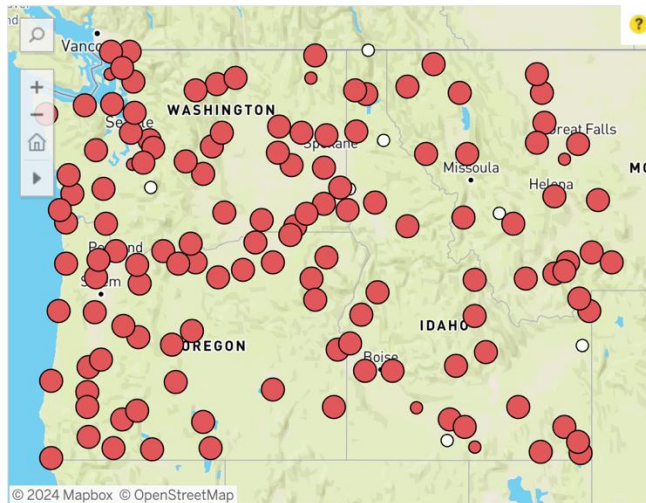


# The Washington State Climate Office

*We provide technical information and analysis, data resources, training and capacity building, and facilitate collaboration.*

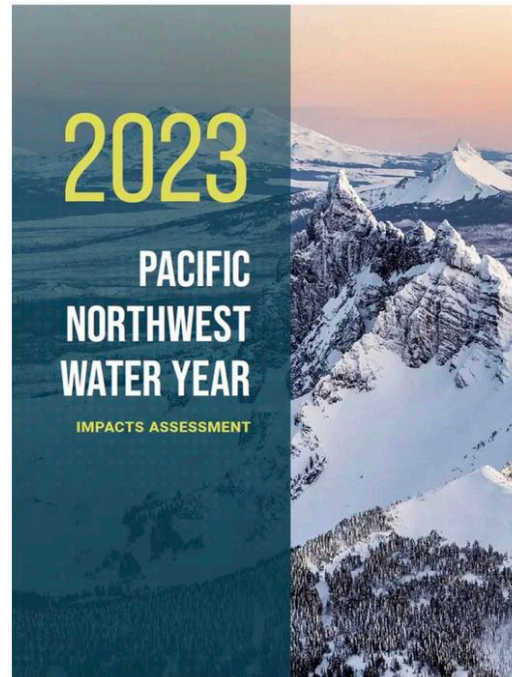
## Our Work:

### PNW Trend Tool:



<https://climate.washington.edu/climate-data/trendanalysisapp/>

*Information*



*Applied Research*

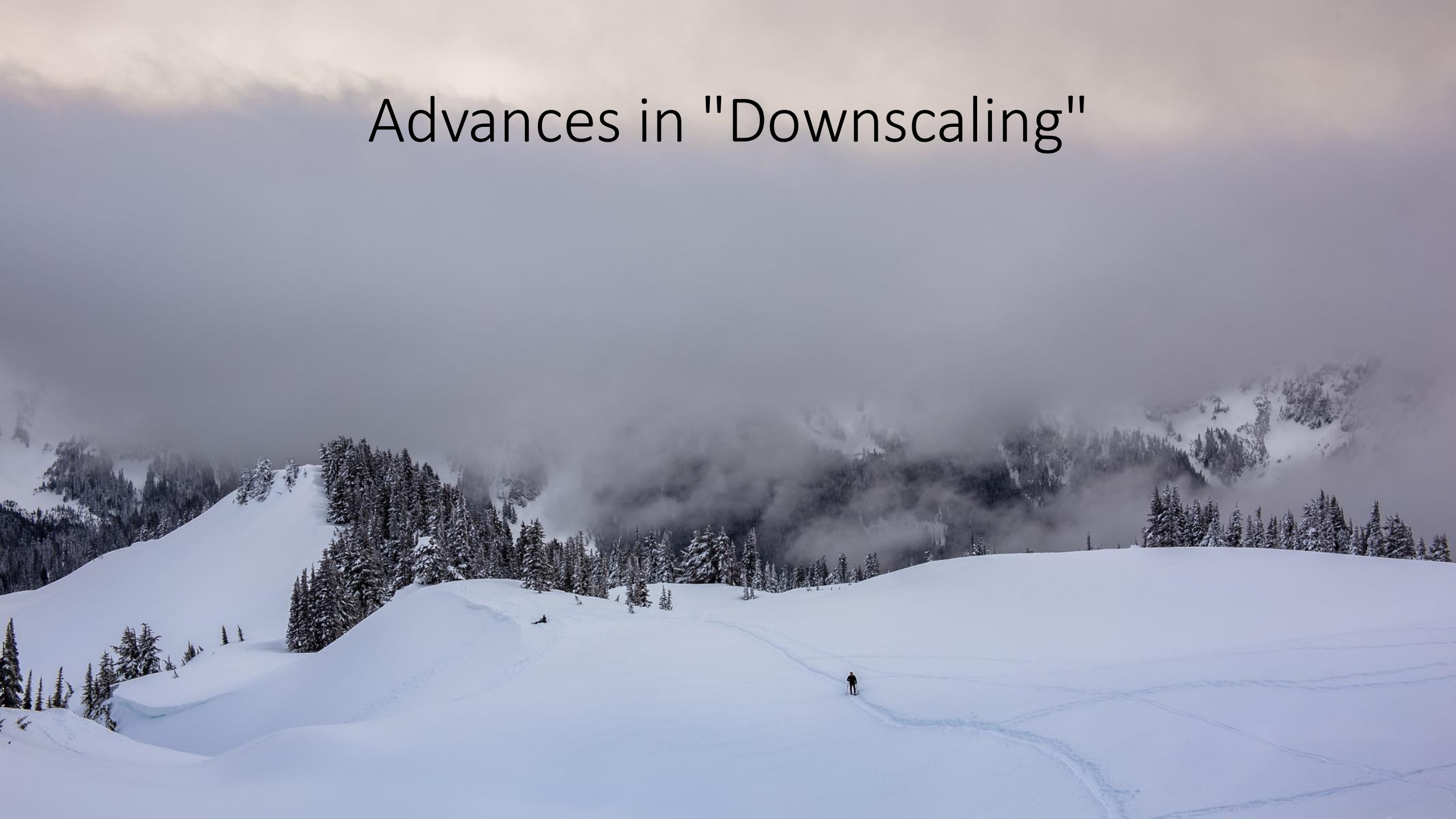
### Washington Drought Declaration



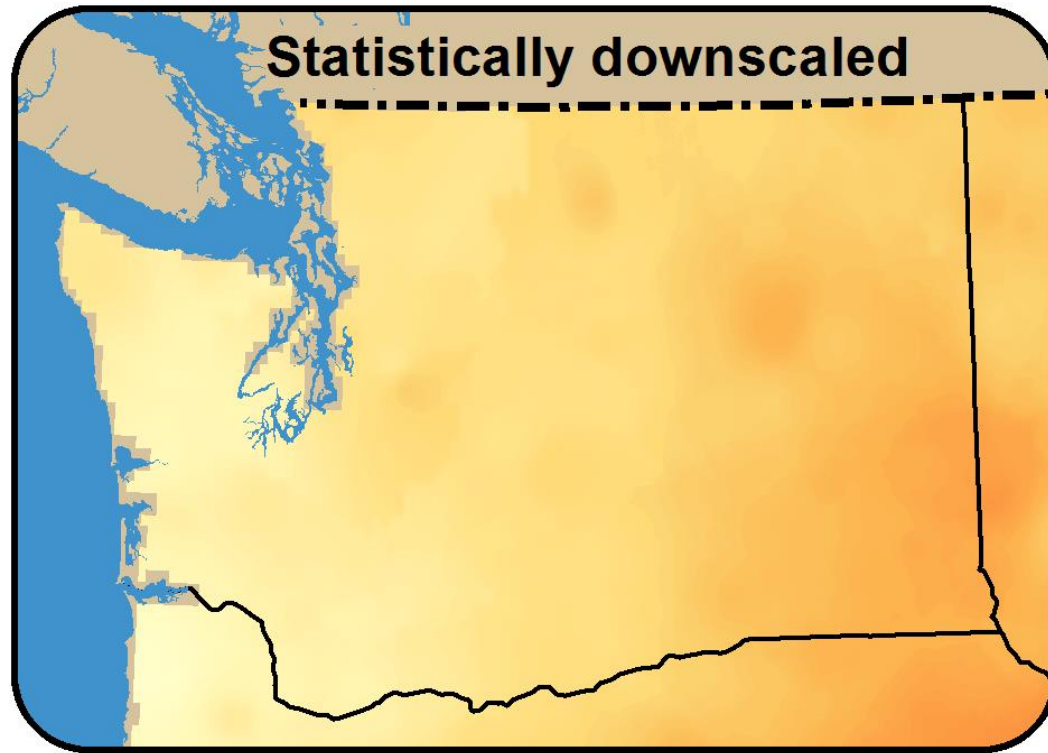
*Training*



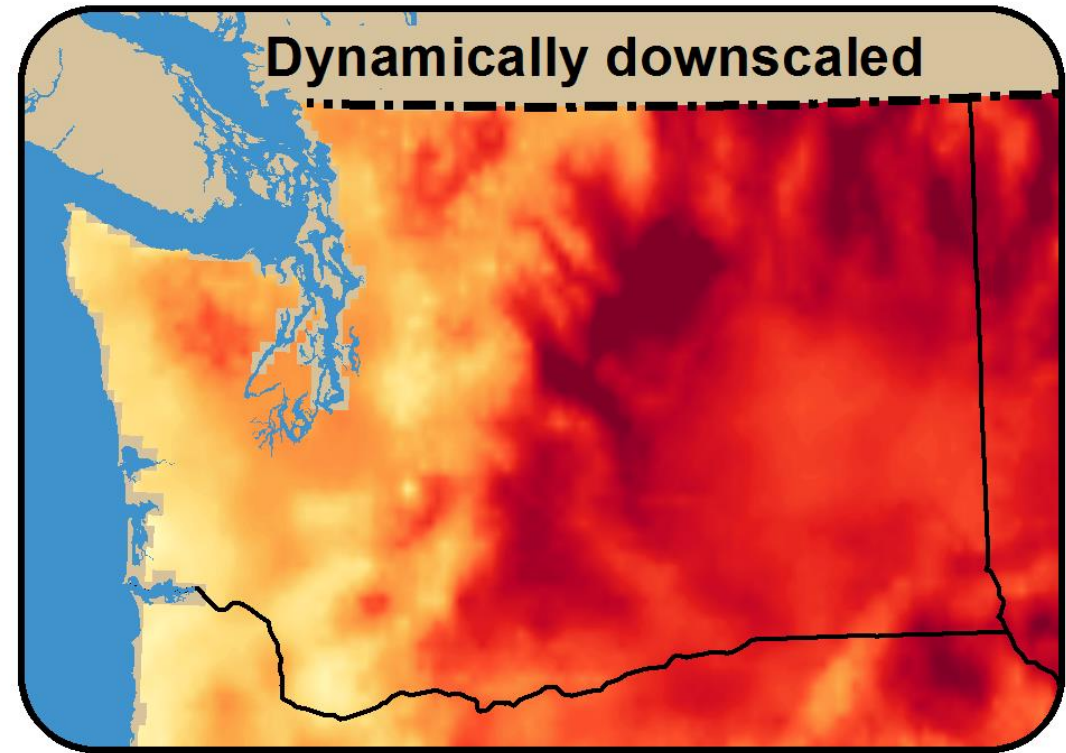
# Advances in "Downscaling"



# More spatial detail from physically-based approach



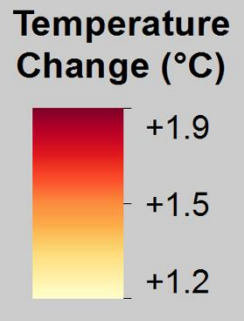
**Statistical (older)**



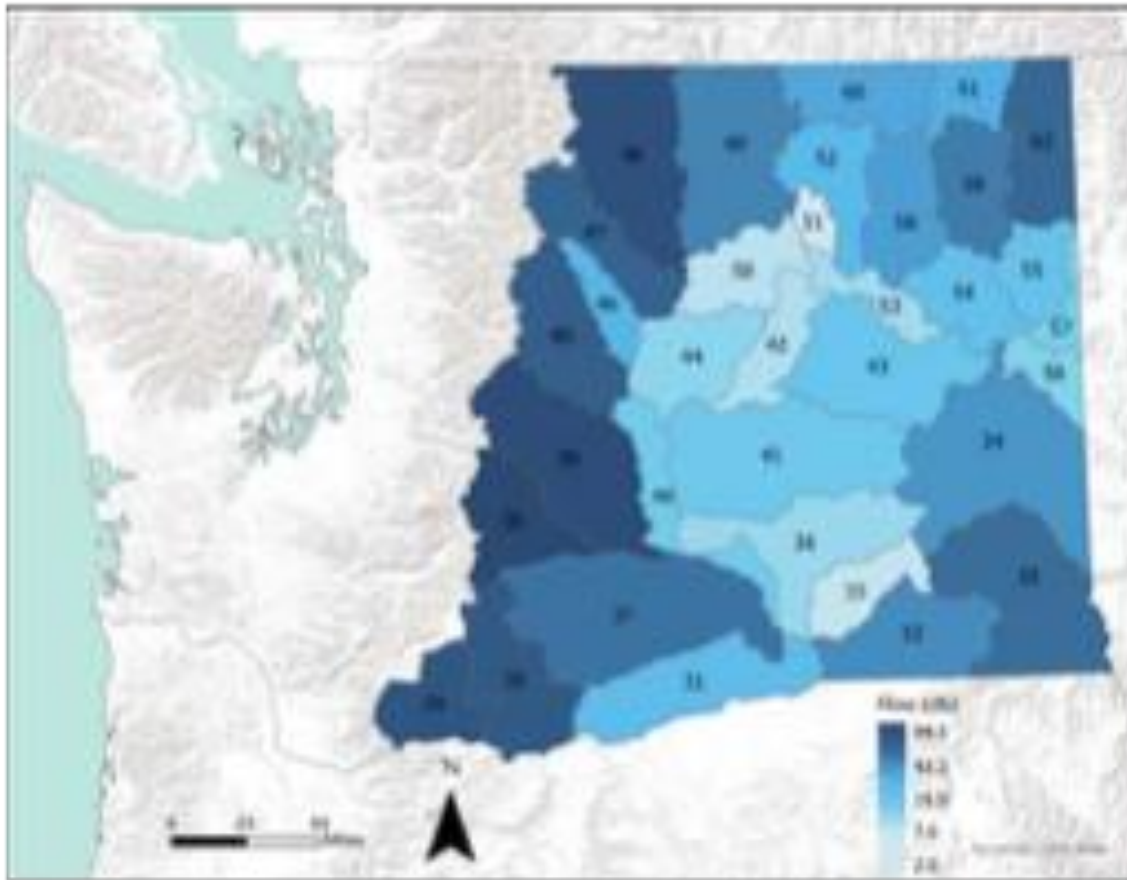
**Dynamical (newer)**

*(Annual average temperature change: ECHAM5, 2040s A1b)*

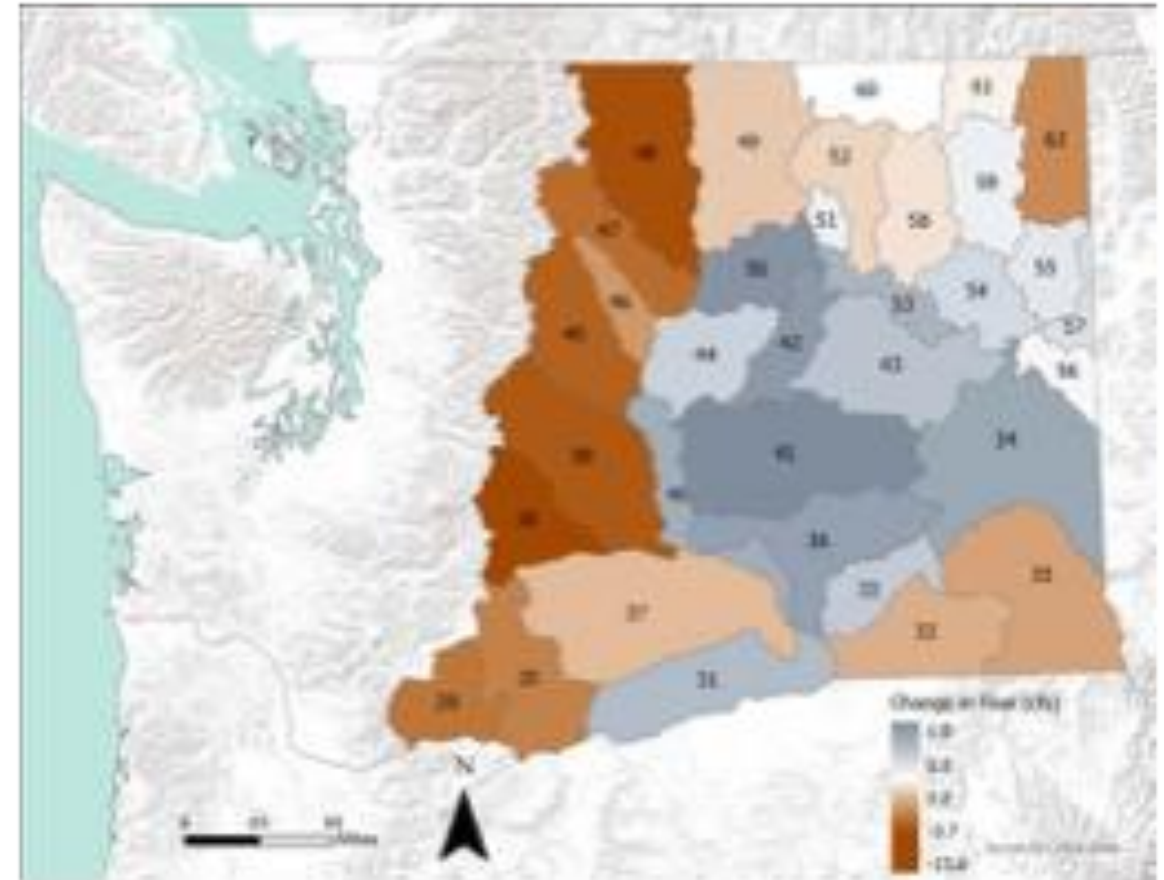
Source: <http://waconnected.org/climate-resilient-corridors/>



# 2021 Forecast: Low Flows map is based on Dynamical Downscaling



Historical Average



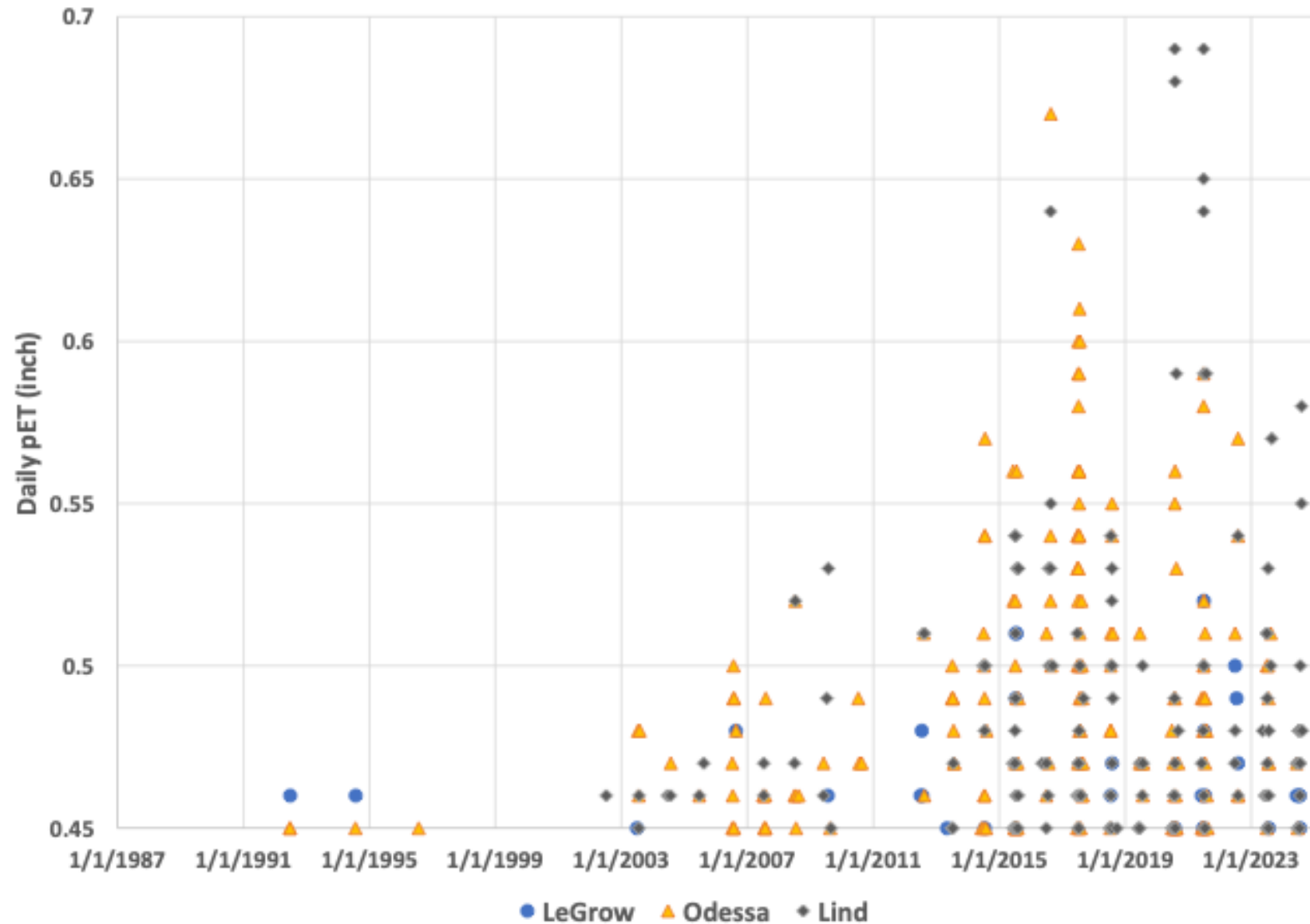
Change: 2040s



# Trends in Evaporation?



# More High Evaporation Days





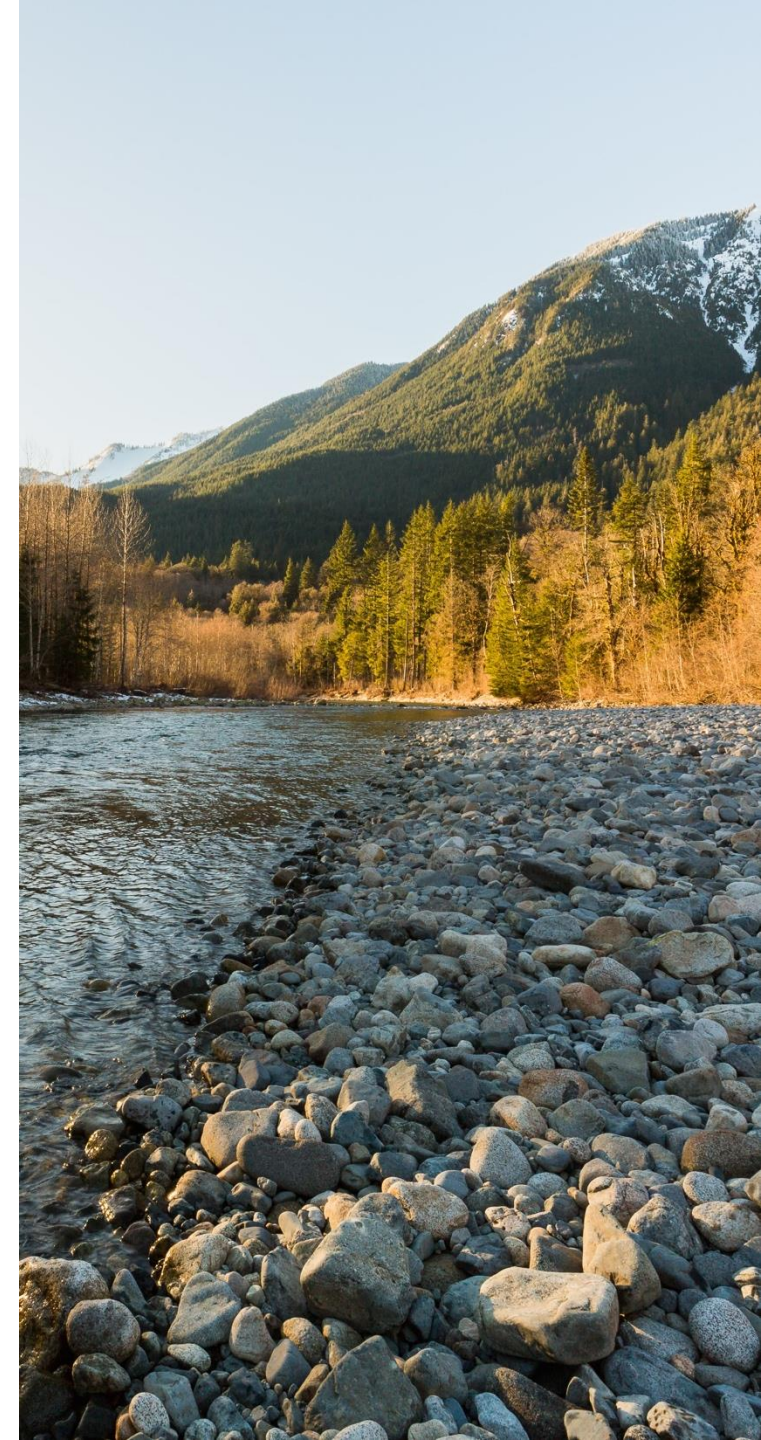
Impacts are  
Understudied





# Impacts depend on magnitude of changes *and* management flexibility

- *Yakima*: Water curtailments for junior users increase from 14% to 68% of years, by the 2080s. (*Vano et al. 2010a*)
- *Statewide*: Increased summer hydropower demand due to A/C use and population growth. (*Hamlet et al. 2010*)
- *Everett, Tacoma*: Water supply reliability remains high even with changes in demand (*Vano et al. 2010b*)
- *Seattle*: High water supply reliability except for demand increases  $> \sim 25\%$  (*Vano et al. 2010b*)





**TRAFFIC**

All lanes blocked at Aurora Ave. N. and N. 96th St. after major crash >

## Weather disasters can teach us how to prepare for the future

Jan. 26, 2022 at 1:57 pm | Updated Jan. 27, 2022 at 11:37 am

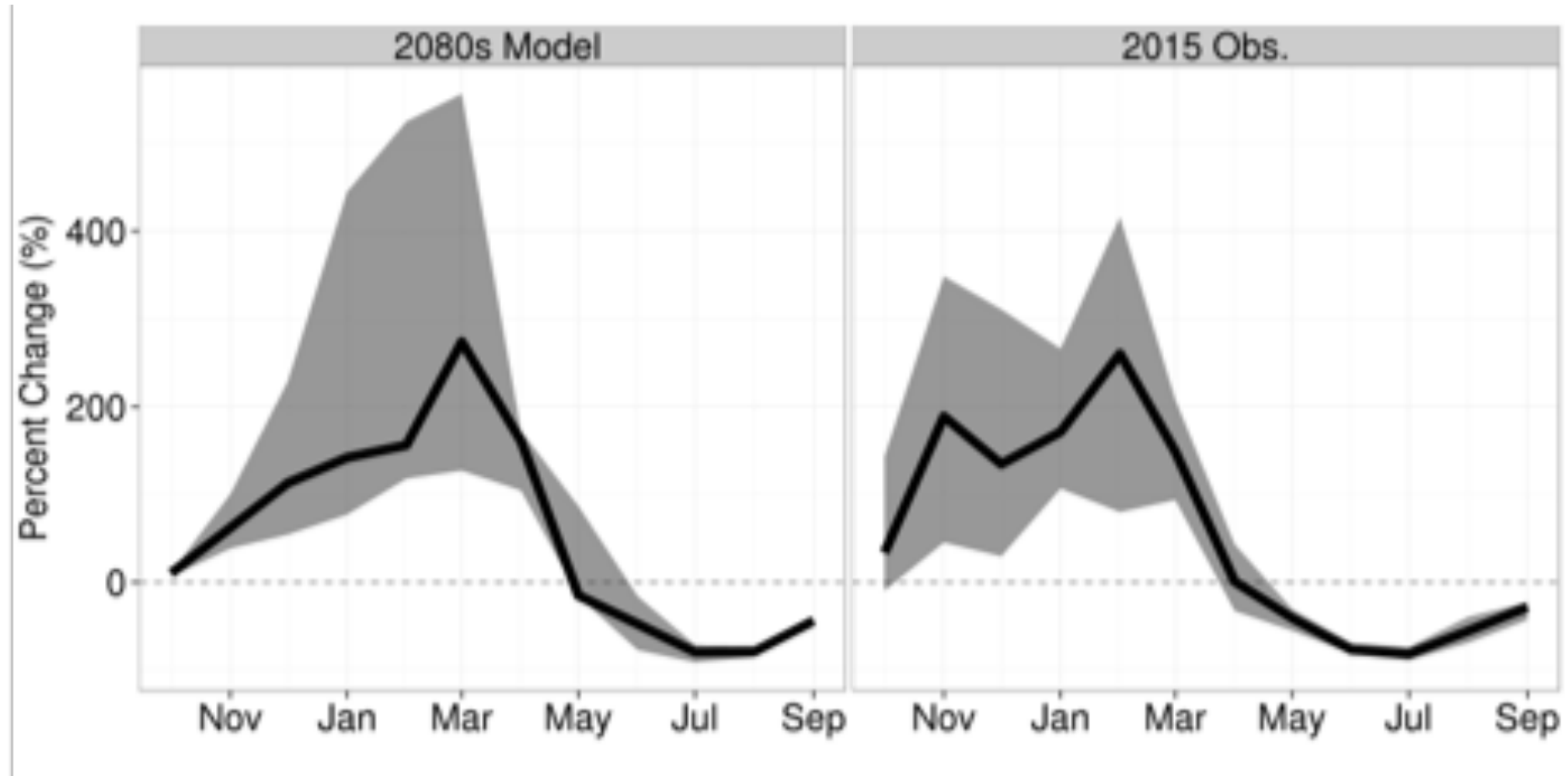


[https://www.seattletimes.com/opinion/  
weather-disasters-can-teach-us-how-to-  
prepare-for-the-future/](https://www.seattletimes.com/opinion/weather-disasters-can-teach-us-how-to-prepare-for-the-future/)



# 2015 as an analog for the future

Change in Streamflow for Icicle Creek:



2015:

## FISHERIES

Low summer streamflow & warm waters resulted in fishery closures

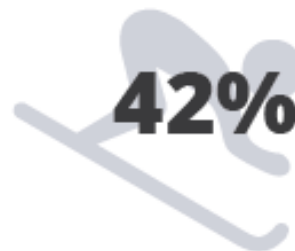


**>250,000**

**Columbia  
River sockeye  
salmon died**

## RECREATION

Low snowpack led to reductions in winter & summer recreation



**42%**

**shorter ski  
season at  
Stevens Pass**

## WILDFIRE

The most severe wildfire season in Washington's recorded history



**>1,000,000**

**acres  
burned**

**>\$253  
million**

**fire  
suppression**

## AGRICULTURE

Warm temperatures & reduced water availability stressed WA agriculture



**17**

**major crops  
with reduced  
yields**

**\$633-733  
million**

**economic  
losses**



# Annual Water Year Impacts & Outlook

Workshop  
(Oct 29-30, 2024)



Survey



Assessment



<https://cig.uw.edu/2024/08/register-today-for-water-year-2024-recap-2025-outlook-meeting/>





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206.685.0317

*Image Credit:* Kendra Kaiser, Boise State University