

# Fourth Oregon Climate Assessment Report

[occri.net/ocar4](http://occri.net/ocar4)

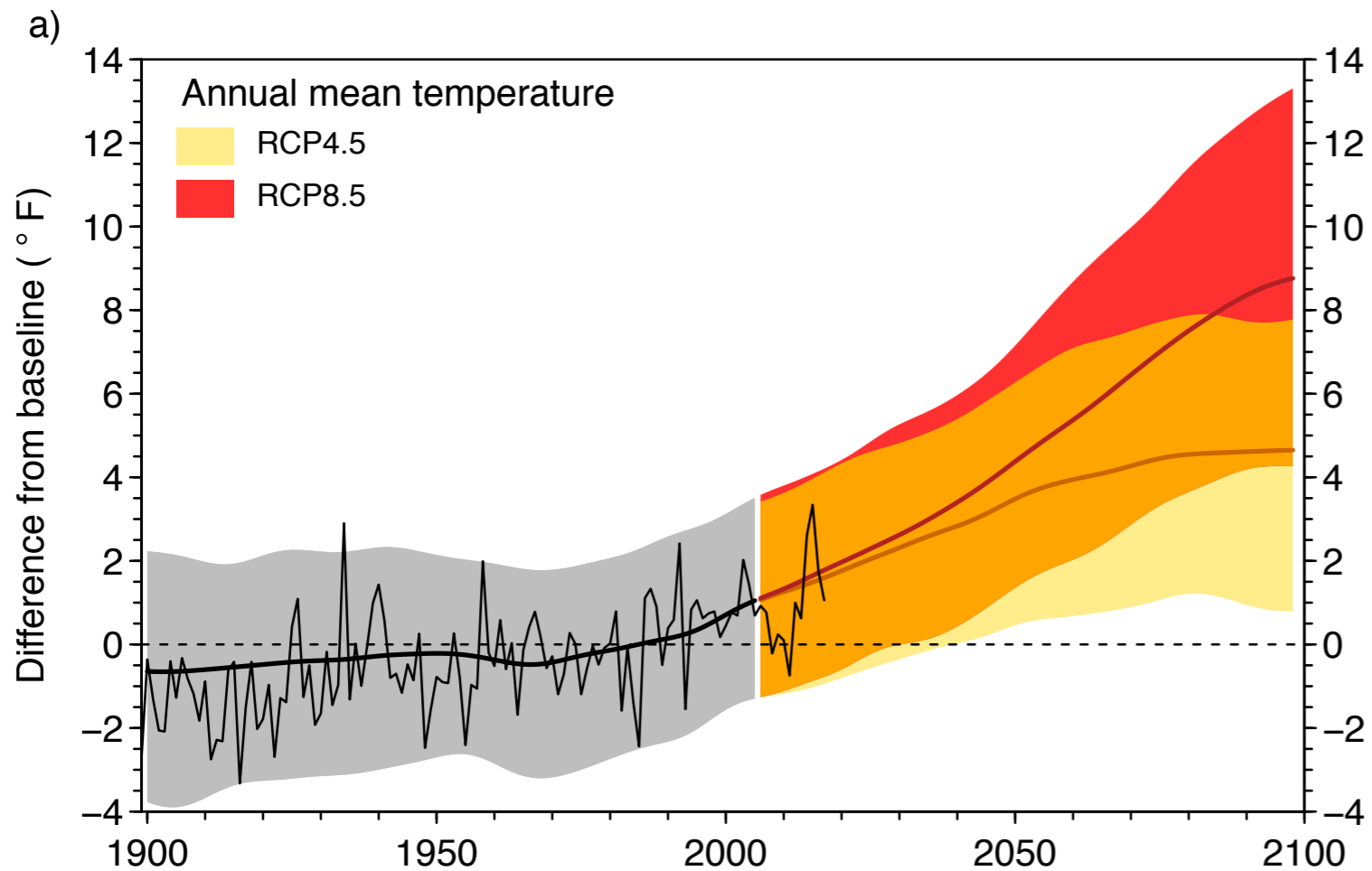
Chapter 1: Climate science  
Chapter 2: Northwest Impacts

Philip Mote  
Oregon Climate Change  
Research Institute  
@pwmote



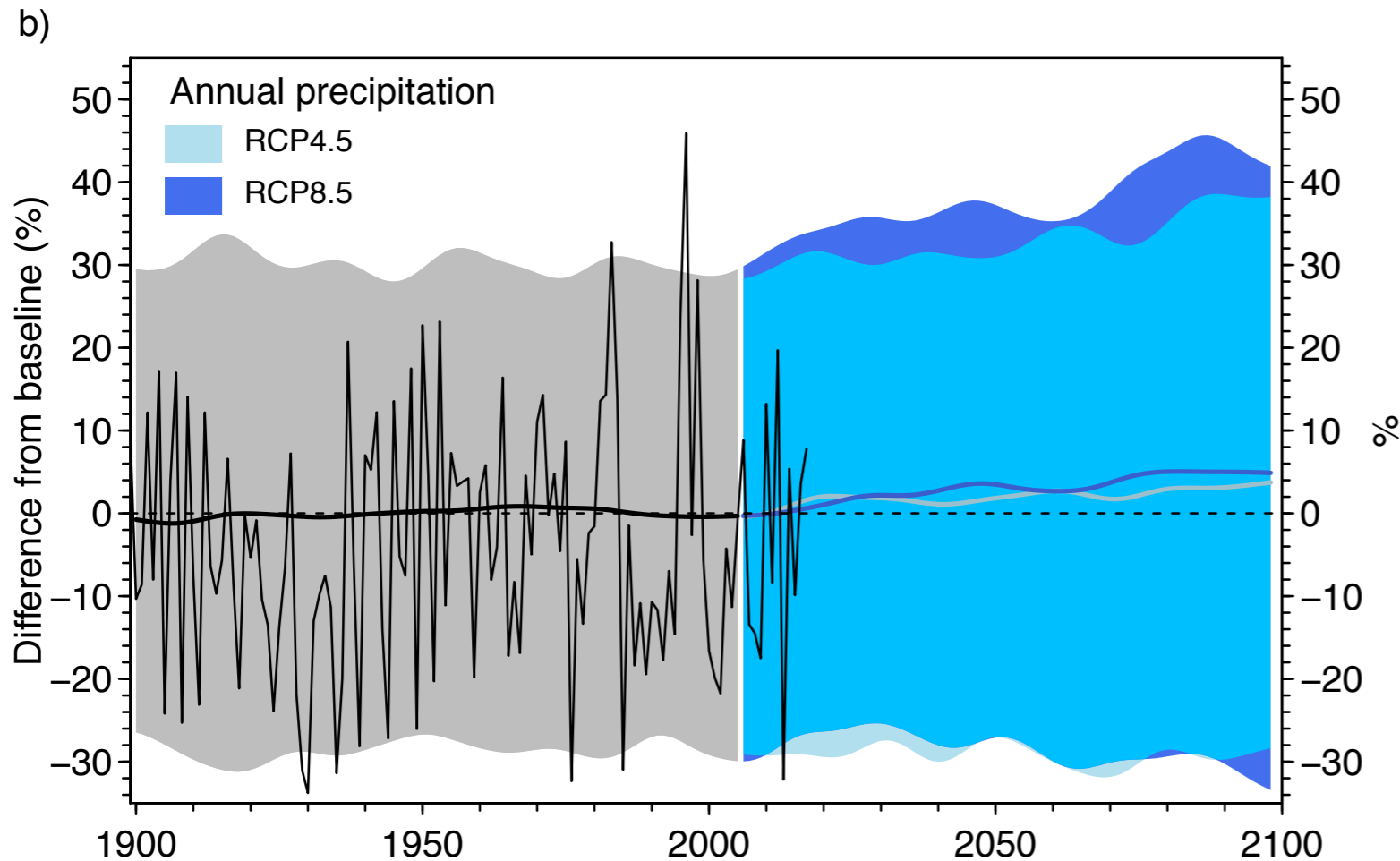
# Global and regional climate

- Warming continues (2018 fourth warmest globally, ~15th in Oregon)
- Regional consequences are evident
  - Fewer cold nights
  - Lower spring snowpack at nearly all sites
  - Larger fire years



# Oregon climate past & future

+1.8° to +6.9°F by the 2050s



-6.0% to +11.4% by the 2050s

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State of climate science: 2019

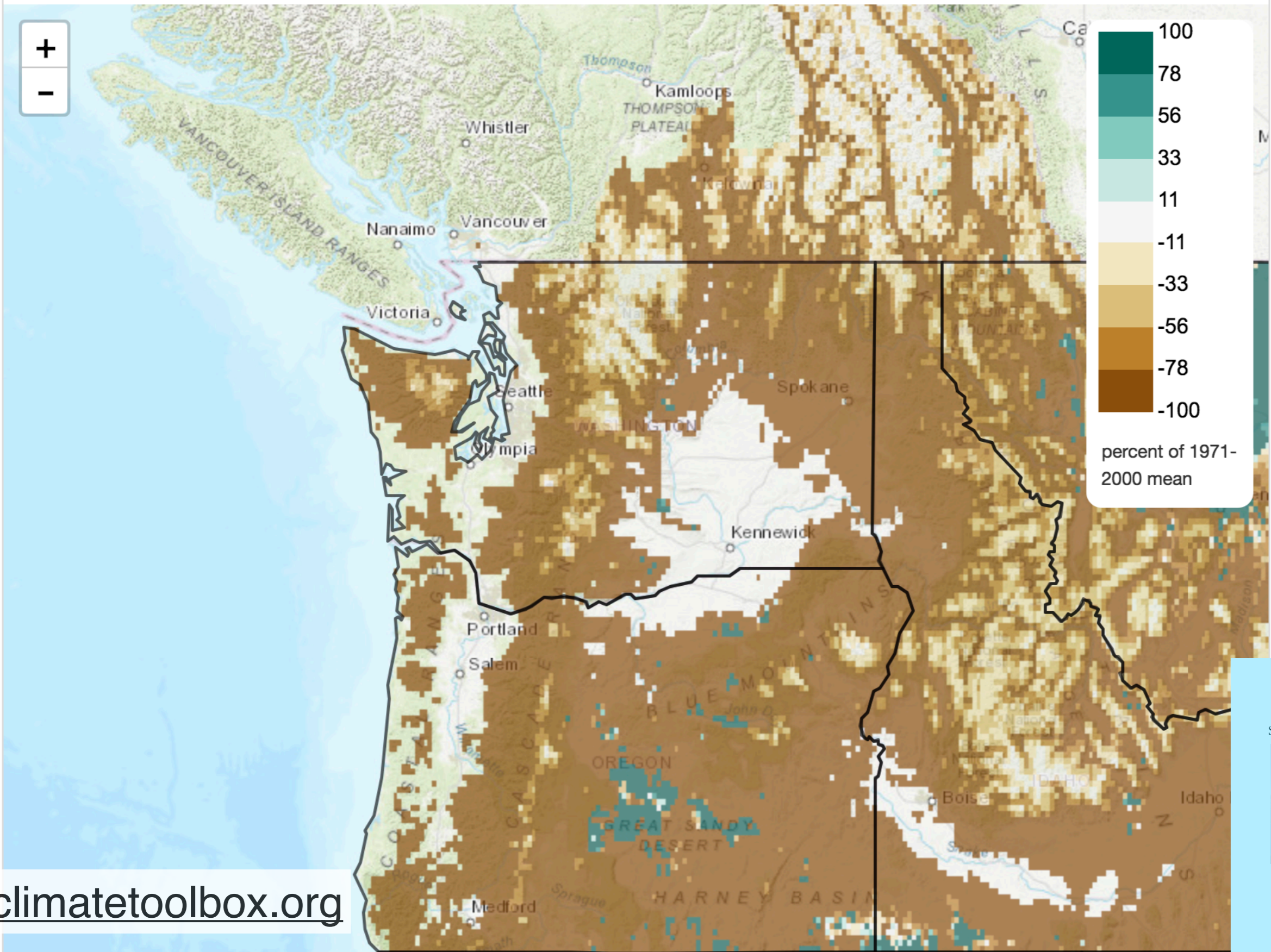


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# Projected Change in Snow Water Equivalent, April 1st

RCP8.5 2070-2099 vs. historical simulation 1971-2000, mean change

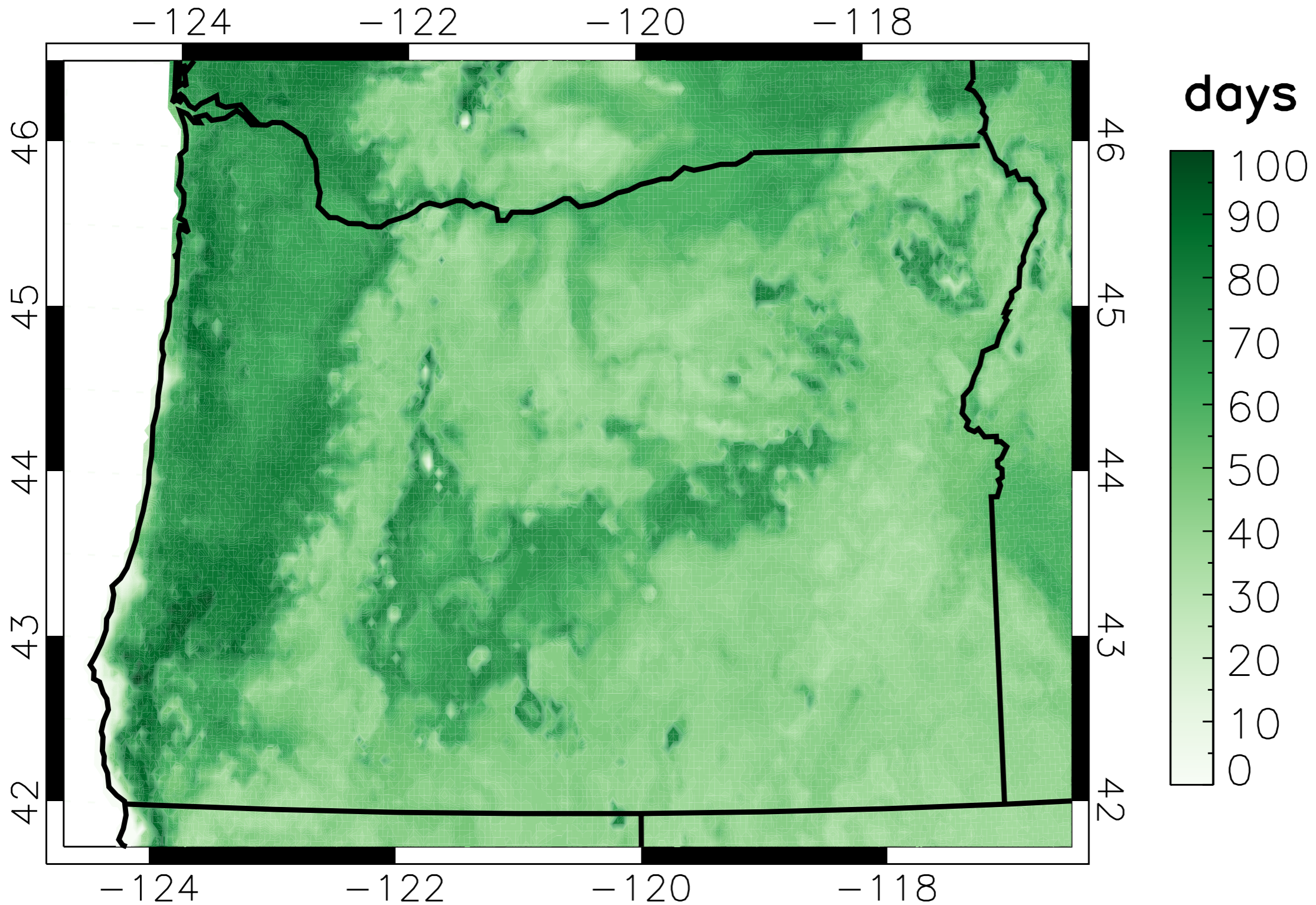
Multi-model (10 models) mean from VIC forced by downscaled models





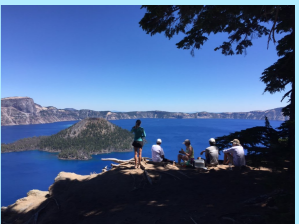
# Longer growing seasons

## 2040–2069 minus 1971–2000



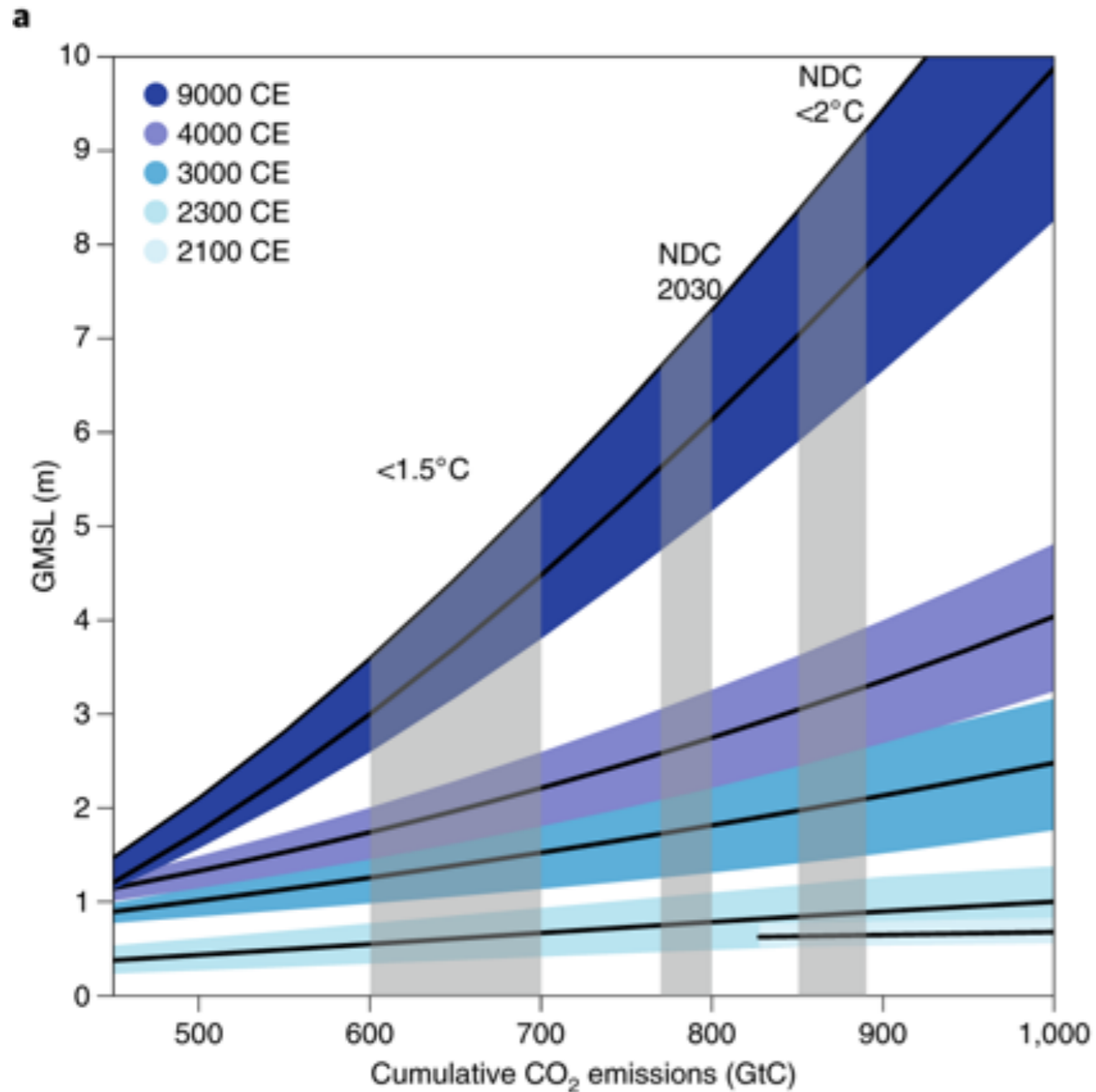
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# Sea level rise commitment

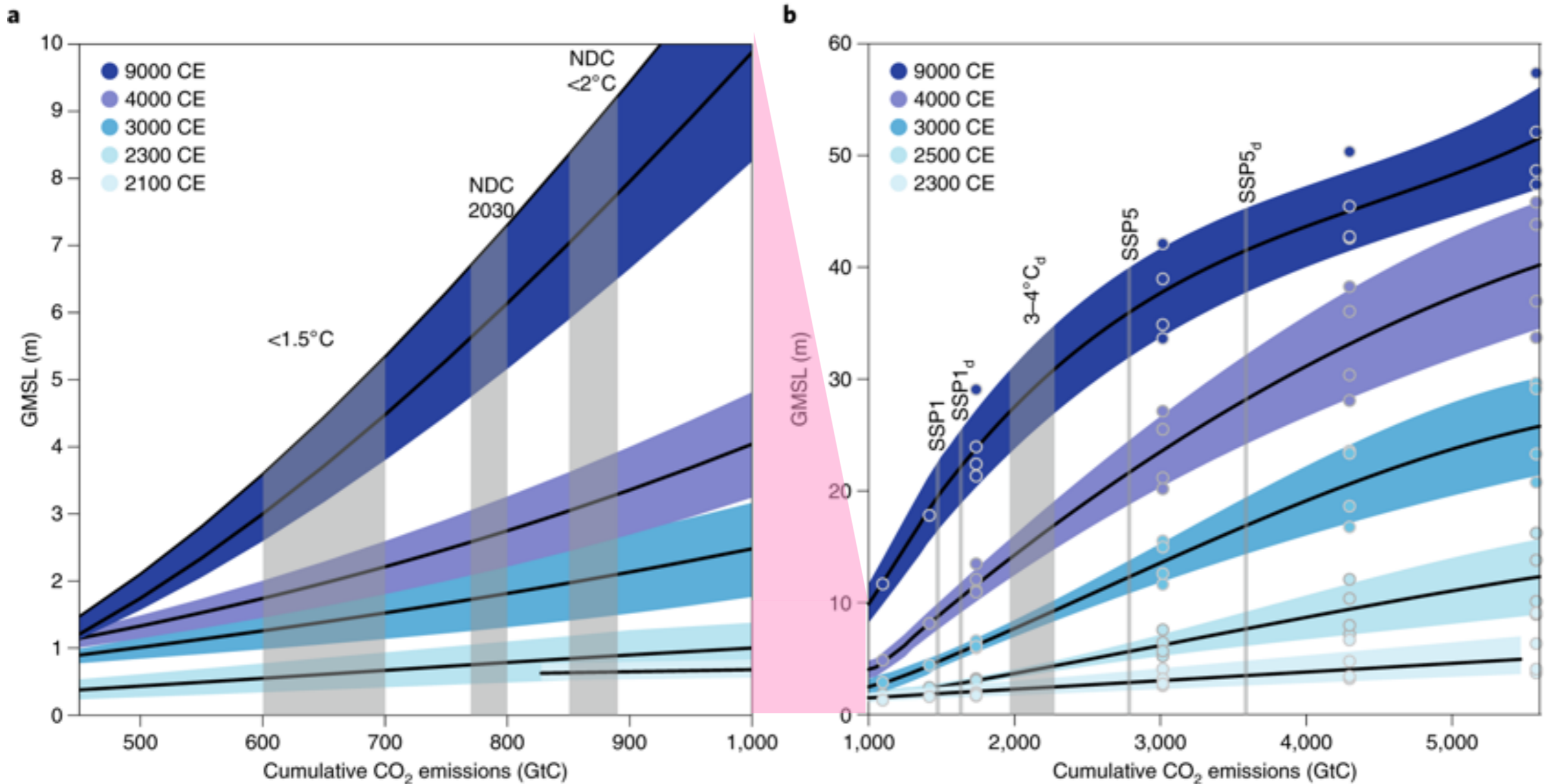


“cumulative emissions of CO<sub>2</sub> control the magnitude of long-term warming, while the rate of warming is modulated by the emissions”

Clark et al. 2018



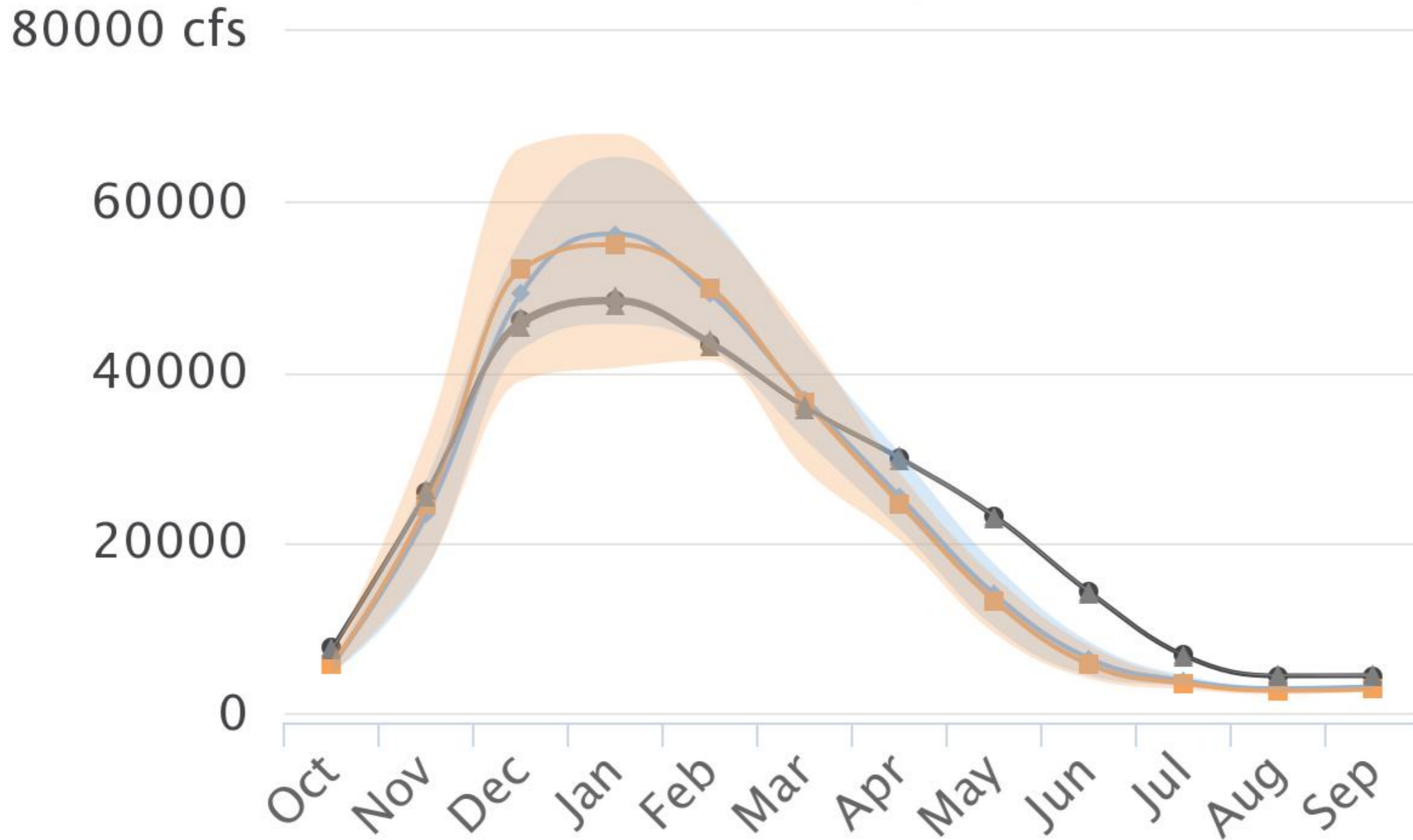
# Sea level rise commitment



Clark et al. 2018

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# Streamflow: Willamette River at Salem



Climate Toolbox, Source: VIC-MACAv2-Livneh CMIP5 Multi-Model Mean Bias-Corrected

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# Fourth National Climate Assessment, Vol II — Impacts, Risks, and Adaptation in the United States

## *Chapter 24 | Northwest*

Christine May, Joe Casola, Michael Chang, Jennifer Cuhaciyan,  
**Meghan Dalton**, Scott Lowe, Gary Morishima, **Philip Mote**, Alexander  
Peterson, **Gabrielle Roesch-McNally**, and Emily York





**Detroit Lake Reservoir in Oregon at record-low levels in 2015.**  
*Photo credit: Dave Reinert, Oregon State University.*





# THEN

**“The net direct effect of the climatic changes is not likely to be favorable to the productivity and stability of existing forests...increased summer temperatures and moisture deficits will substantially increase the potential for the occurrence, intensity, and extent of wildfires.”**

*– Mote et al. 1999 p. 67*

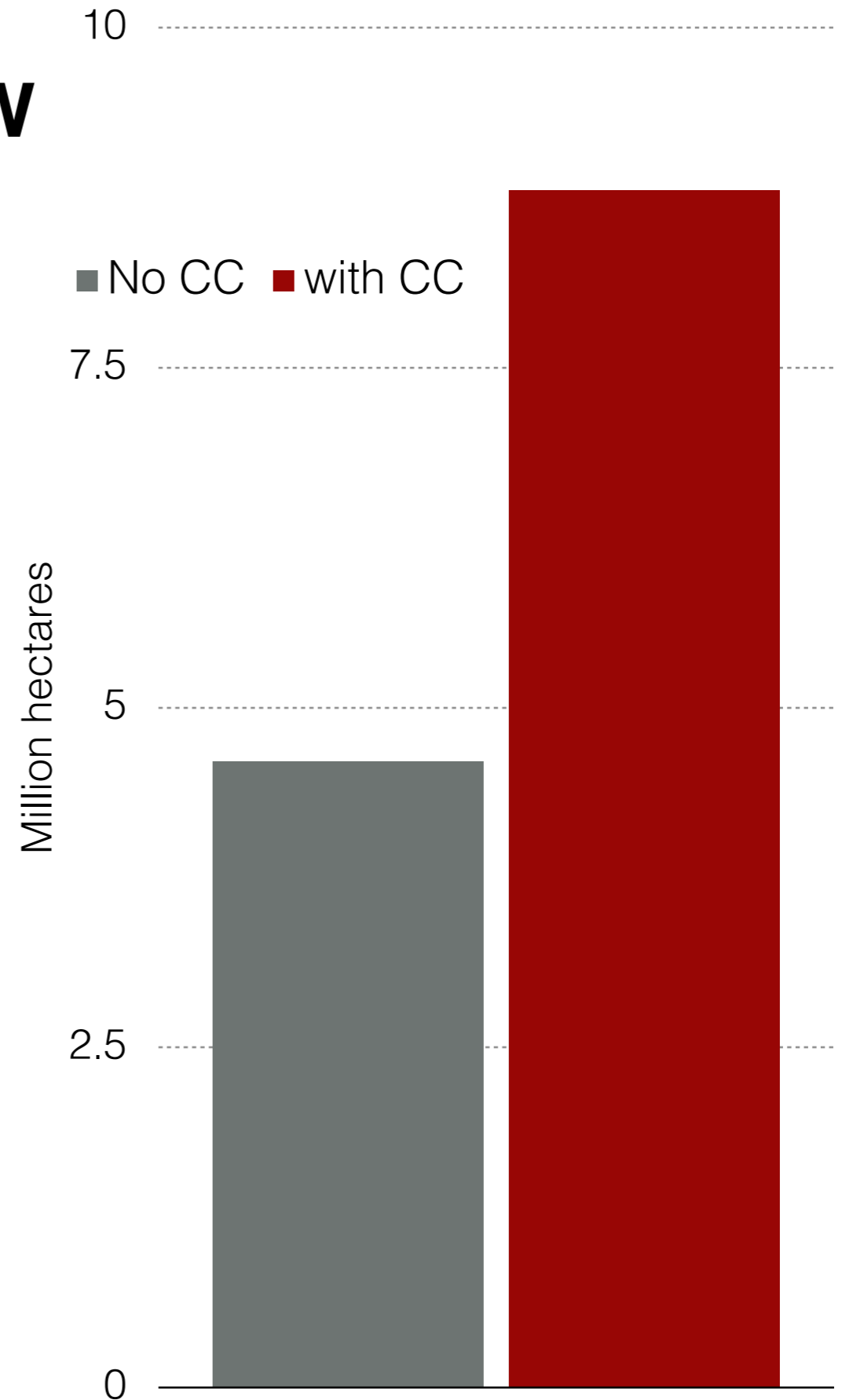


Human-caused climate change doubled the area burned in western US since 1985

Abatzoglou and Williams (2016) redrawn by P Mote



**NOW**



# Conclusions & thoughts



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- Wildfire has emerged as a major climate-driven concern
- Adaptation can avert the worst effects and capture opportunities
- OCCRI: an intellectual resource for the state



# 24 Key Message #1



## Natural Resource Economy

Climate change is already affecting the Northwest's diverse natural resources, which support sustainable livelihoods; provide a robust foundation for rural, tribal, and Indigenous communities; and strengthen local economies. Climate change is expected to continue affecting the natural resource sector, but the economic consequences will depend on future market dynamics, management actions, and adaptation efforts. **Proactive management can increase the resilience of many natural resources and their associated economies.**

# 24 Key Message #2



## Natural World and Cultural Heritage

Climate change and extreme events are already endangering the well-being of a wide range of wildlife, fish, and plants, which are intimately tied to tribal subsistence culture and popular outdoor recreation activities. Climate change is projected to continue to have adverse impacts on the regional environment, with implications for the values, identity, heritage, cultures, and quality of life of the region's diverse population. Adaptation and informed management, especially culturally appropriate strategies, will likely increase the resilience of the region's natural capital.



# 24 Key Message #3



## Infrastructure

Existing water, transportation, and energy infrastructure already face challenges from flooding, landslides, drought, wildfire, and heat waves. Climate change is projected to increase the risks from many of these extreme events, potentially compromising the reliability of water supplies, hydropower, and transportation across the region. Isolated communities and those with systems that lack redundancy are the most vulnerable. Adaptation strategies that address more than one sector, or are coupled with social and environmental co-benefits, can increase resilience.

# 24 Key Message #4



## Health

Organizations and volunteers that make up the Northwest's social safety net are already stretched thin with current demands. Healthcare and social systems will likely be further challenged with the increasing frequency of acute events, or when cascading events occur. In addition to an increased likelihood of hazards and epidemics, disruptions in local economies and food systems are projected to result in more chronic health risks. The potential health co-benefits of future climate mitigation investments could help to counterbalance these risks.



# 24 Key Message #5



## Frontline Communities

Communities on the front lines of climate change experience the first, and often the worst, effects. Frontline communities in the Northwest include tribes and Indigenous peoples, those most dependent on natural resources for their livelihoods, and the economically disadvantaged. These communities generally prioritize basic needs, such as shelter, food, and transportation; frequently lack economic and political capital; and have fewer resources to prepare for and cope with climate disruptions. The social and cultural cohesion inherent in many of these communities provides a foundation for building community capacity and increasing resilience.