climate change in Oregon

Kathie Dello, Associate Director
Oregon Climate Change Research Institute
occri.net

OCCRI

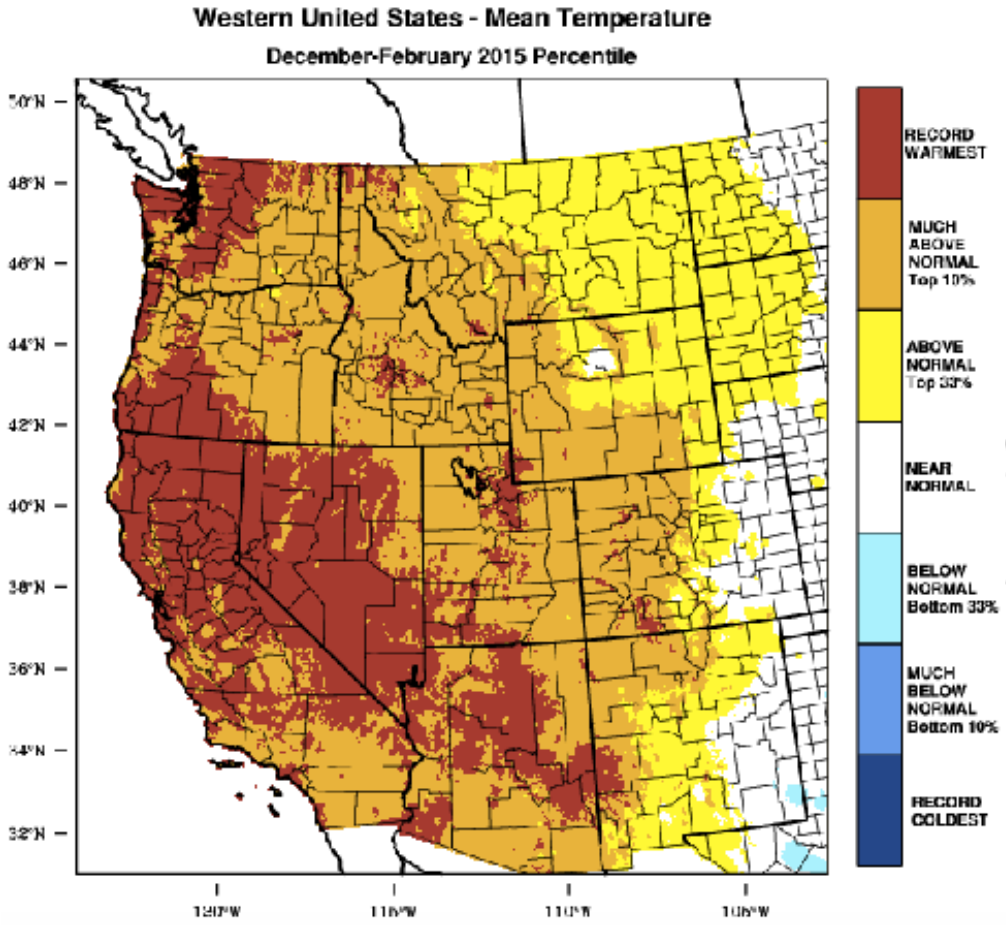
Oregon State University

Eagle Creek Fire, September 2017

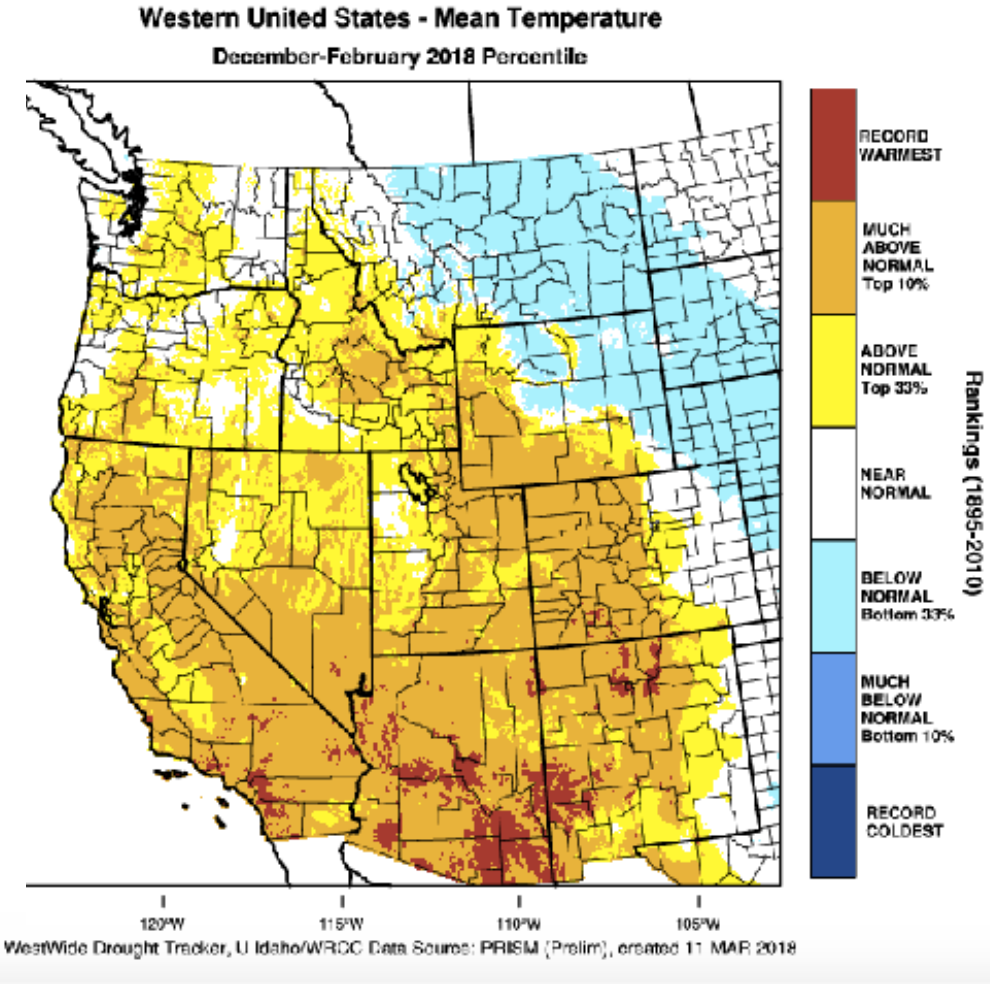
Kathie Dello, photo

from Hoodoo web cam
February 23, 2015

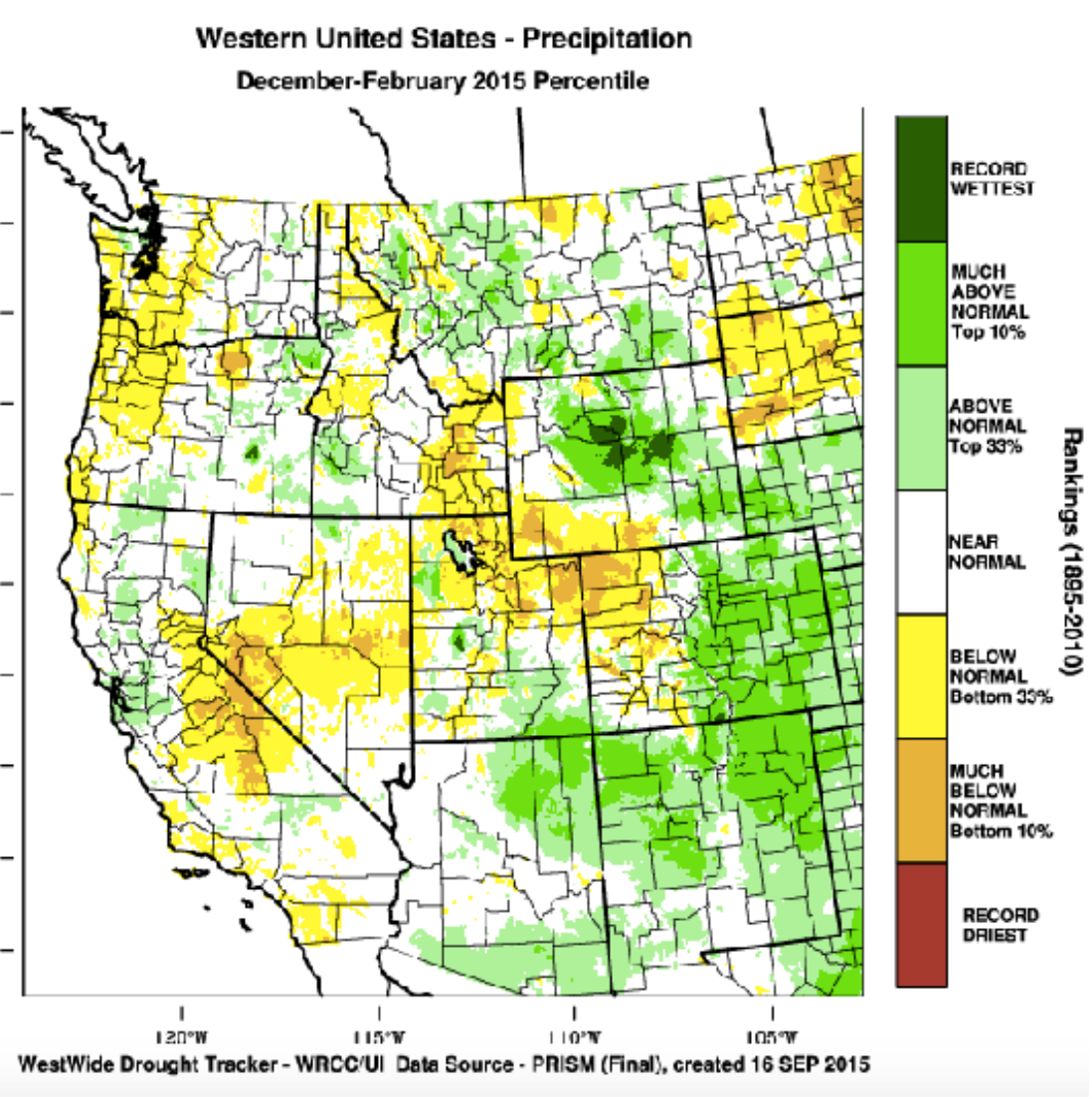
Winter 2015



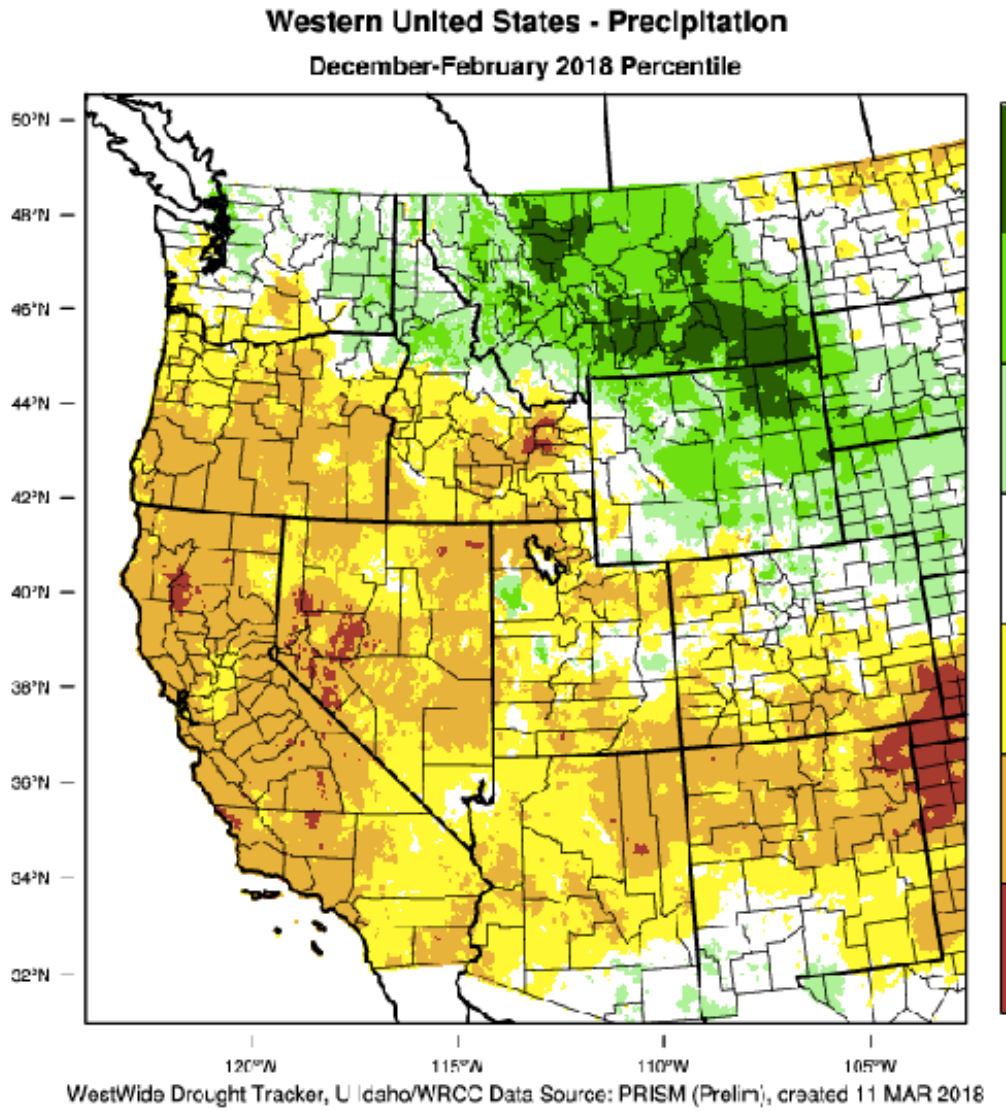
Winter 2018



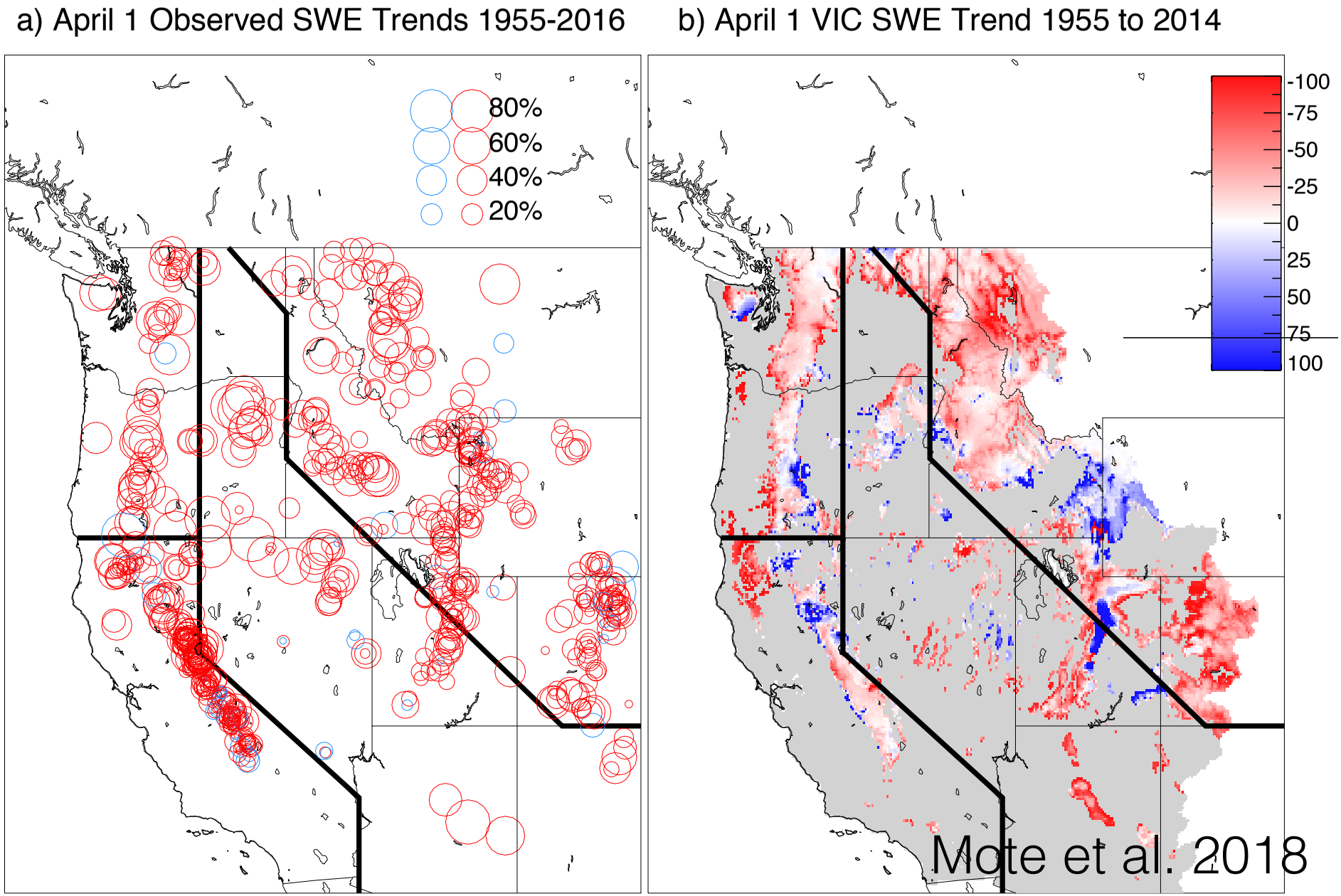
Winter 2015



Winter 2018



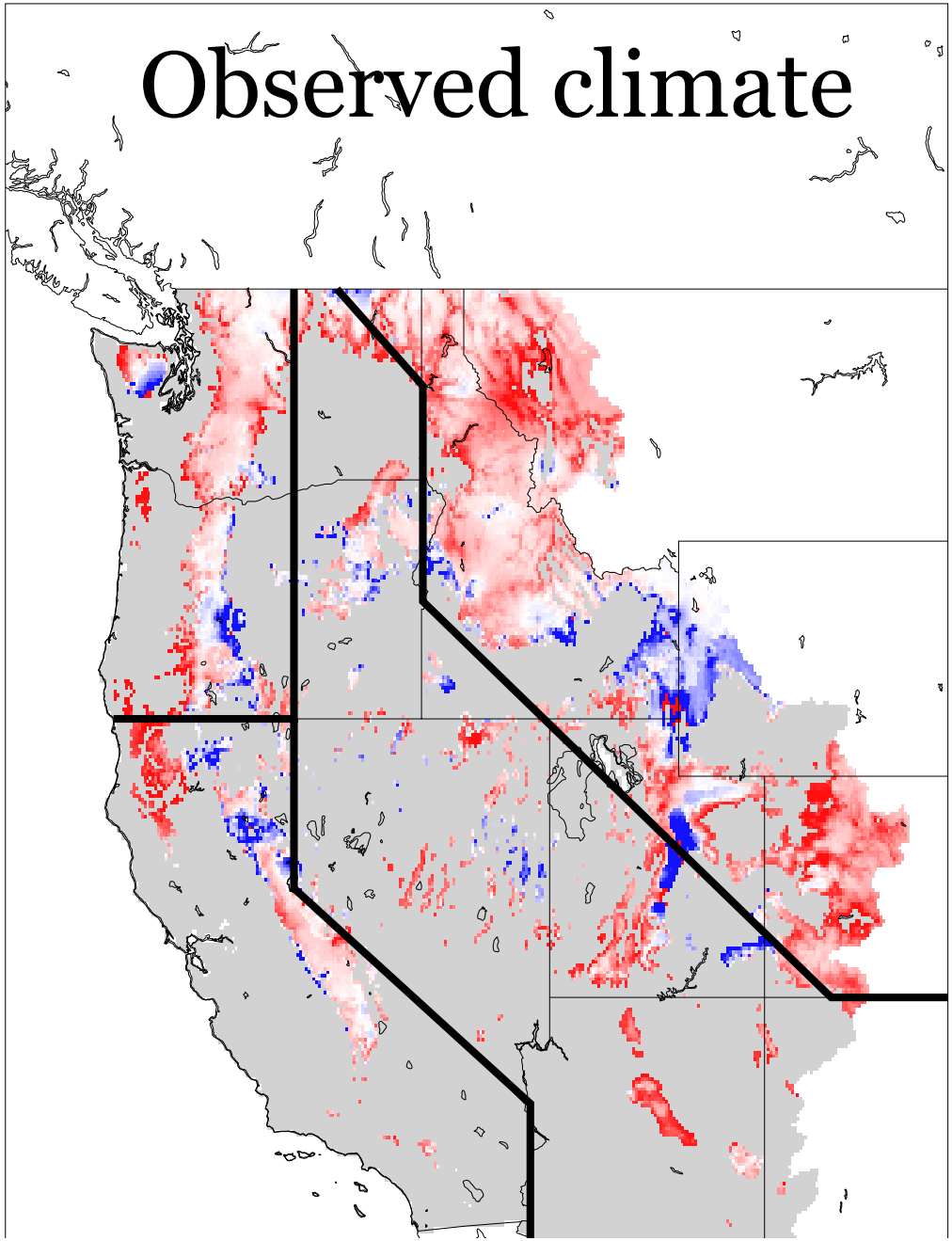
Obs & model: 90% decline

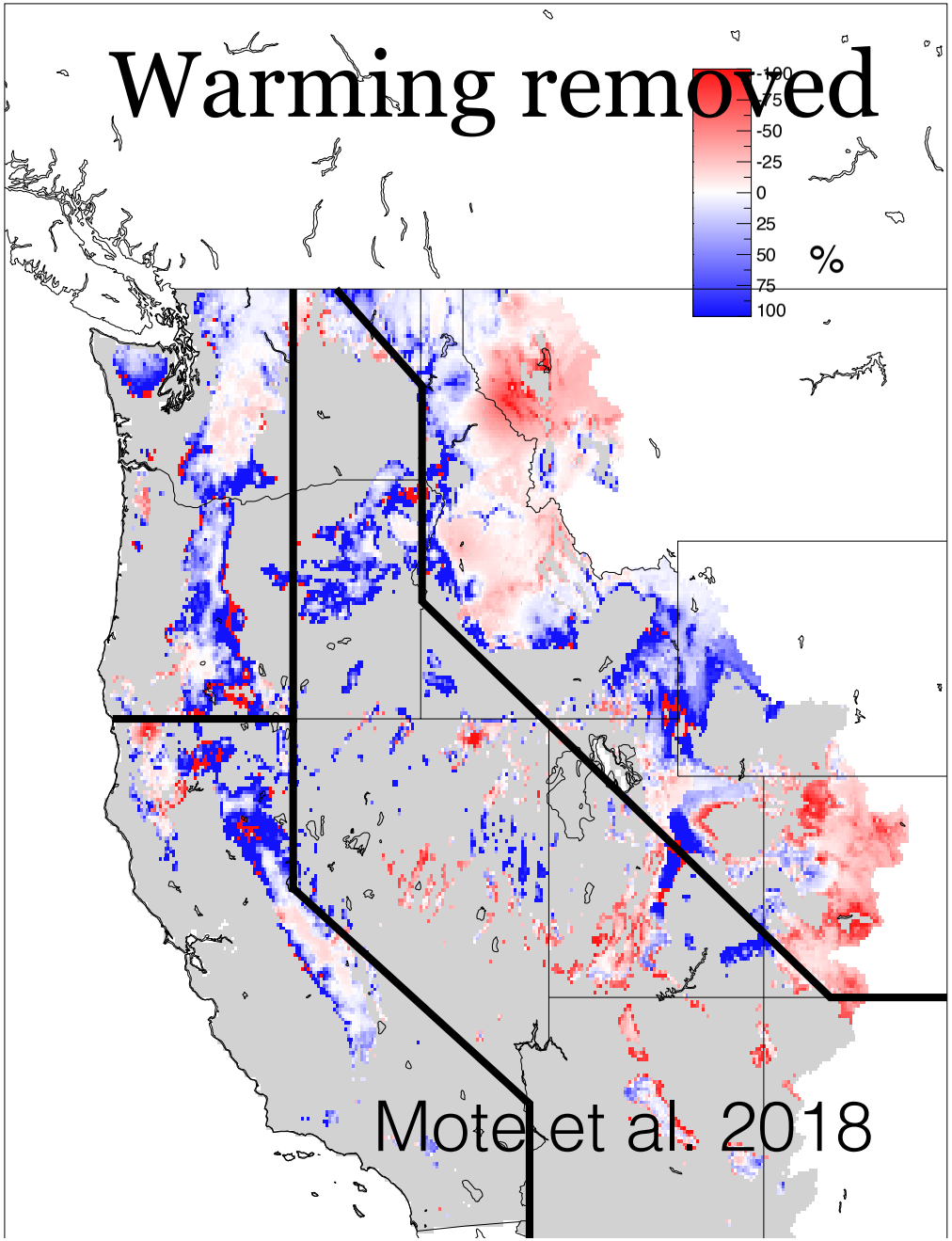


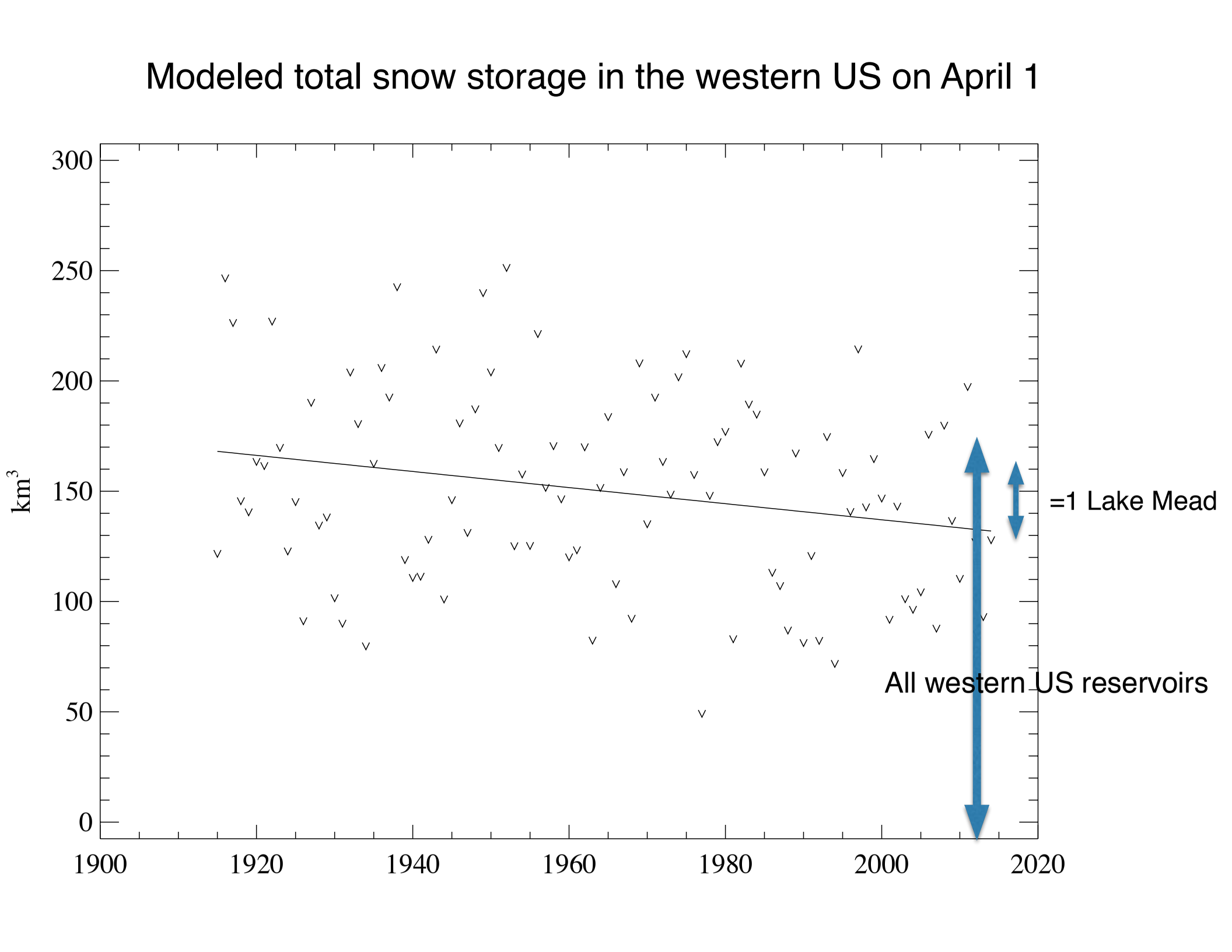
Role of warming

b) April 1 VIC SWE Trend 1955 to 2014

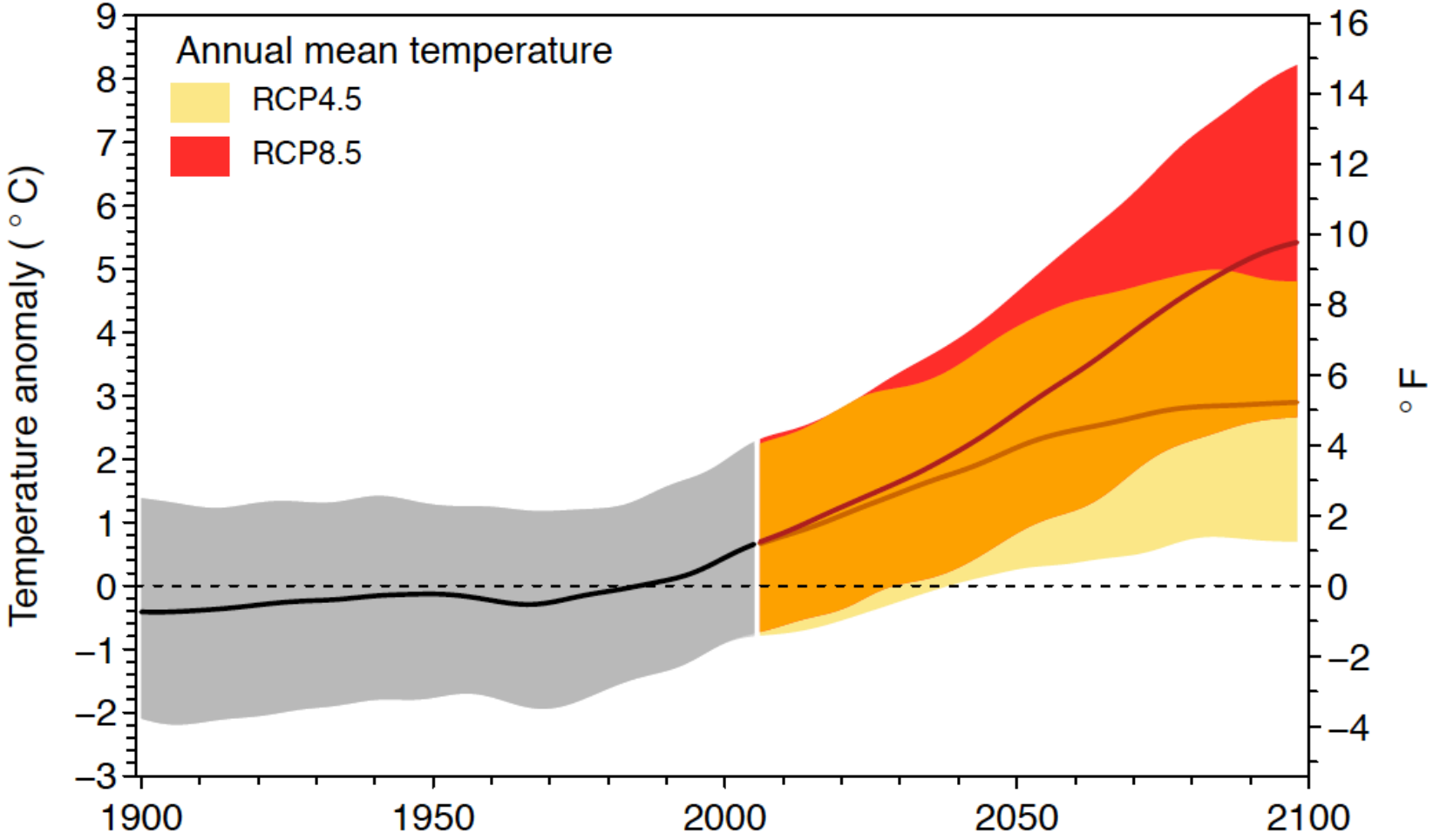
c) April 1 VIC SWE Trend(Detrended) 1955 to 2014






Modeled total snow storage in the western US on April 1
300
250
200
150
100
50
0
km3
1900
1920
1940
1960
1980
2000
2020
=1 Lake Mead
All western US reservoirs

Temperature Projections for the Columbia Basin**

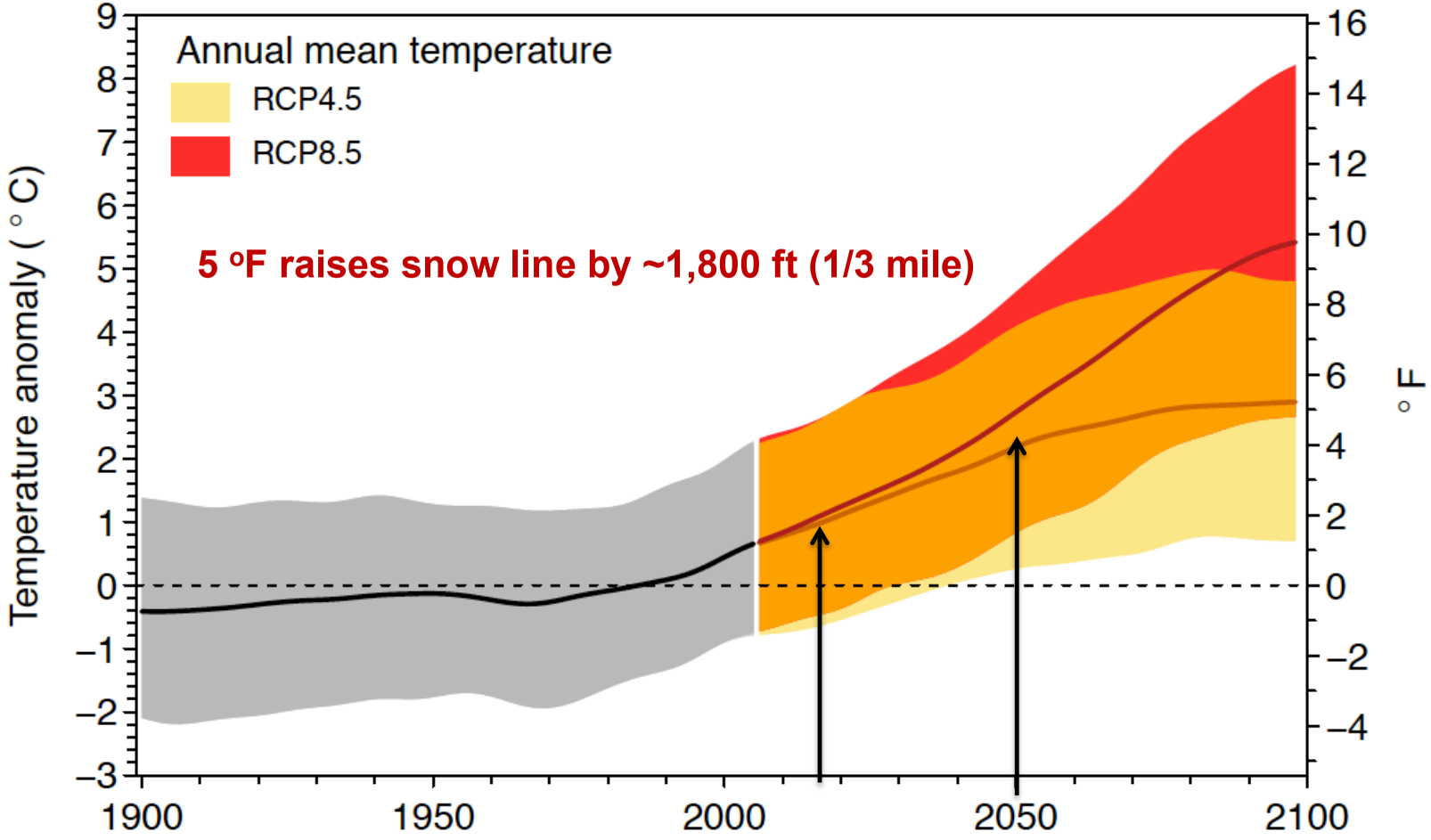


*Departure from 1979-1999 average
**Above Bonneville Dam

Source: Rupp, Abatzoglou, & Mote, Climate Dynamics, 2016

Red: High Emissions
Yellow: Low Emissions

Temperature Projections for the Columbia Basin**

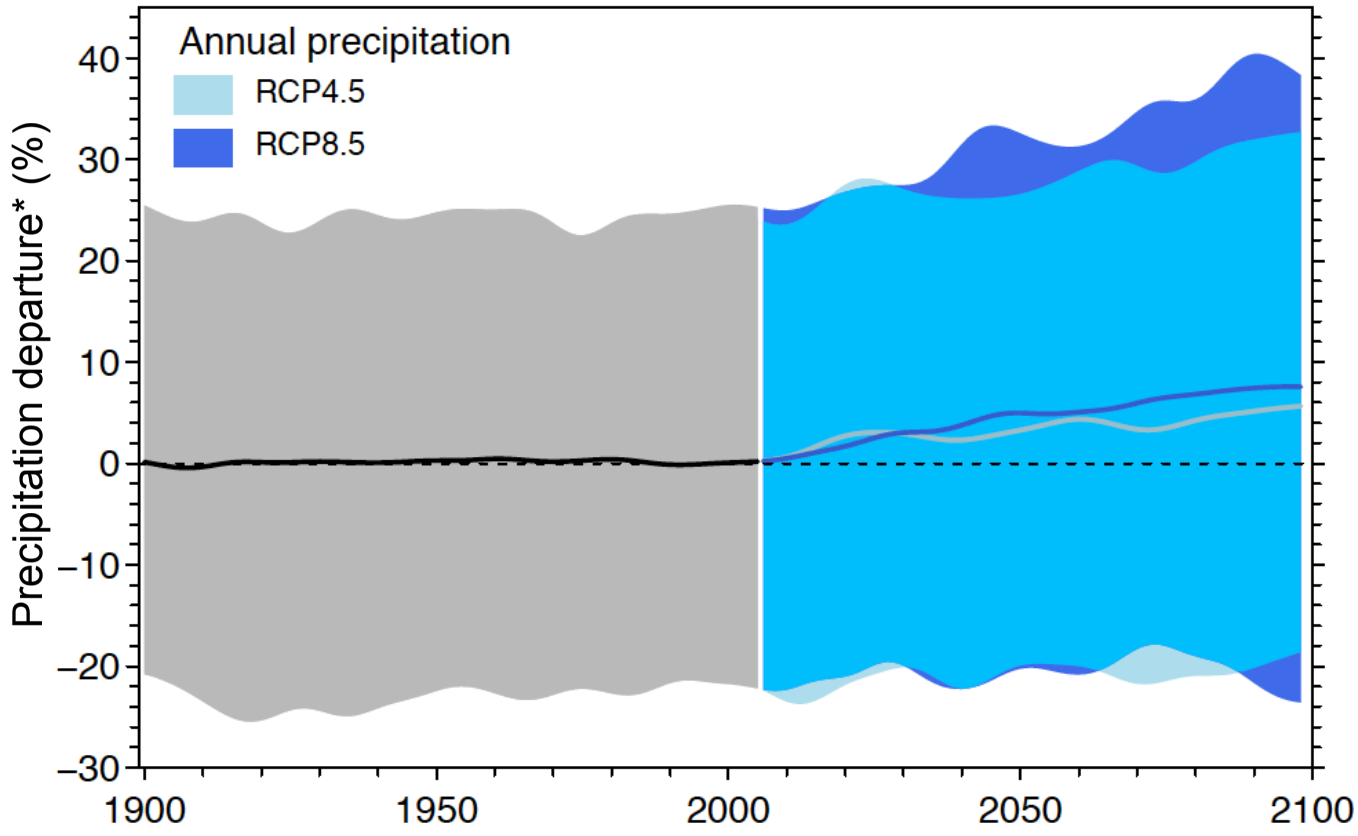


*Departure from 1979-1999 average
**Above Bonneville Dam

Source: Rupp, Abatzoglou, & Mote, Climate Dynamics, 2016

Red: High Emissions
Yellow: Low Emissions

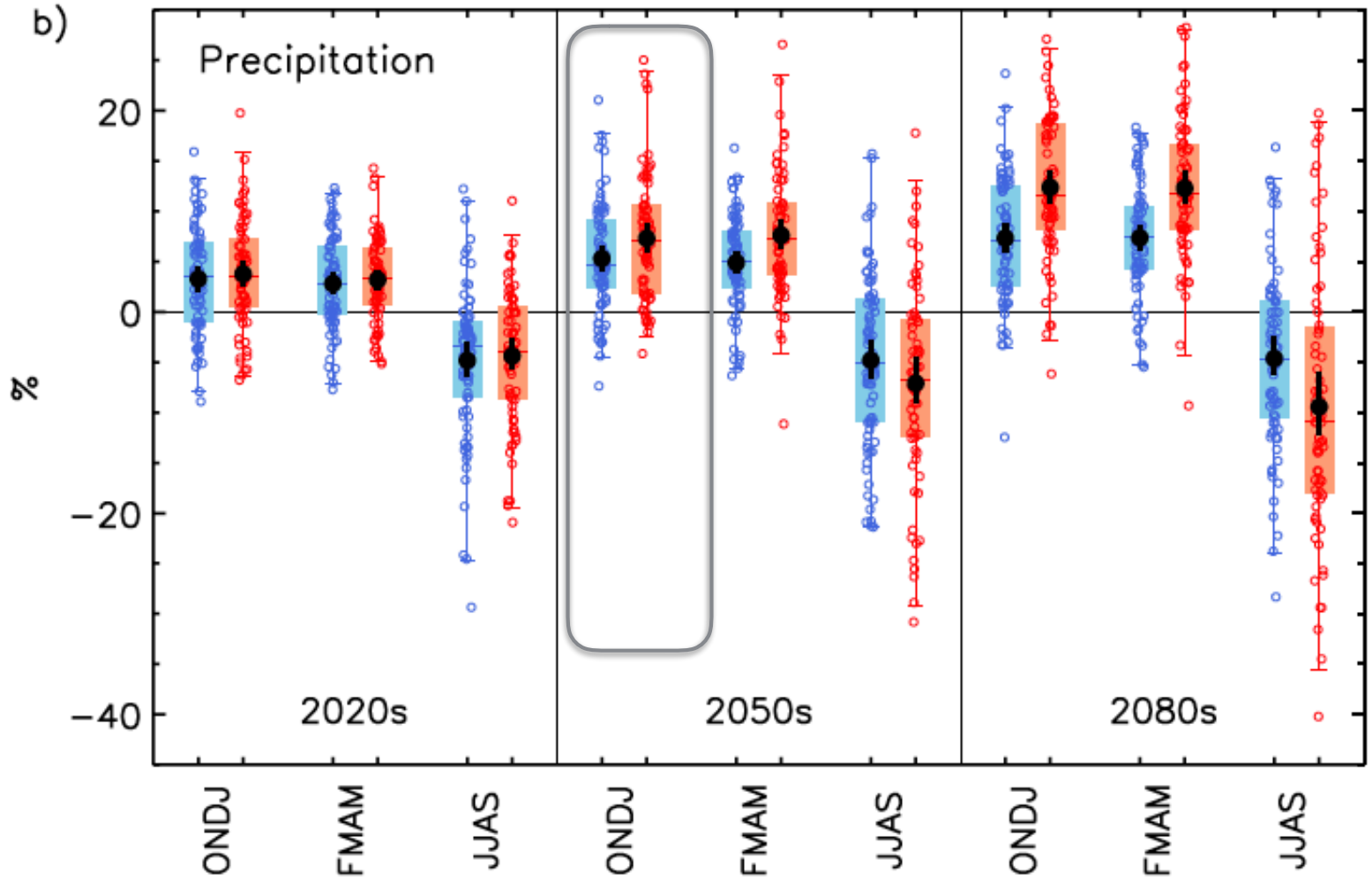
Precipitation Projections for the Columbia Basin



*Relative departure from 1979-1999 average

Source: Rupp, Abatzoglou, & Mote, Climate Dynamics, 2016

Precipitation changes by season: Columbia Basin



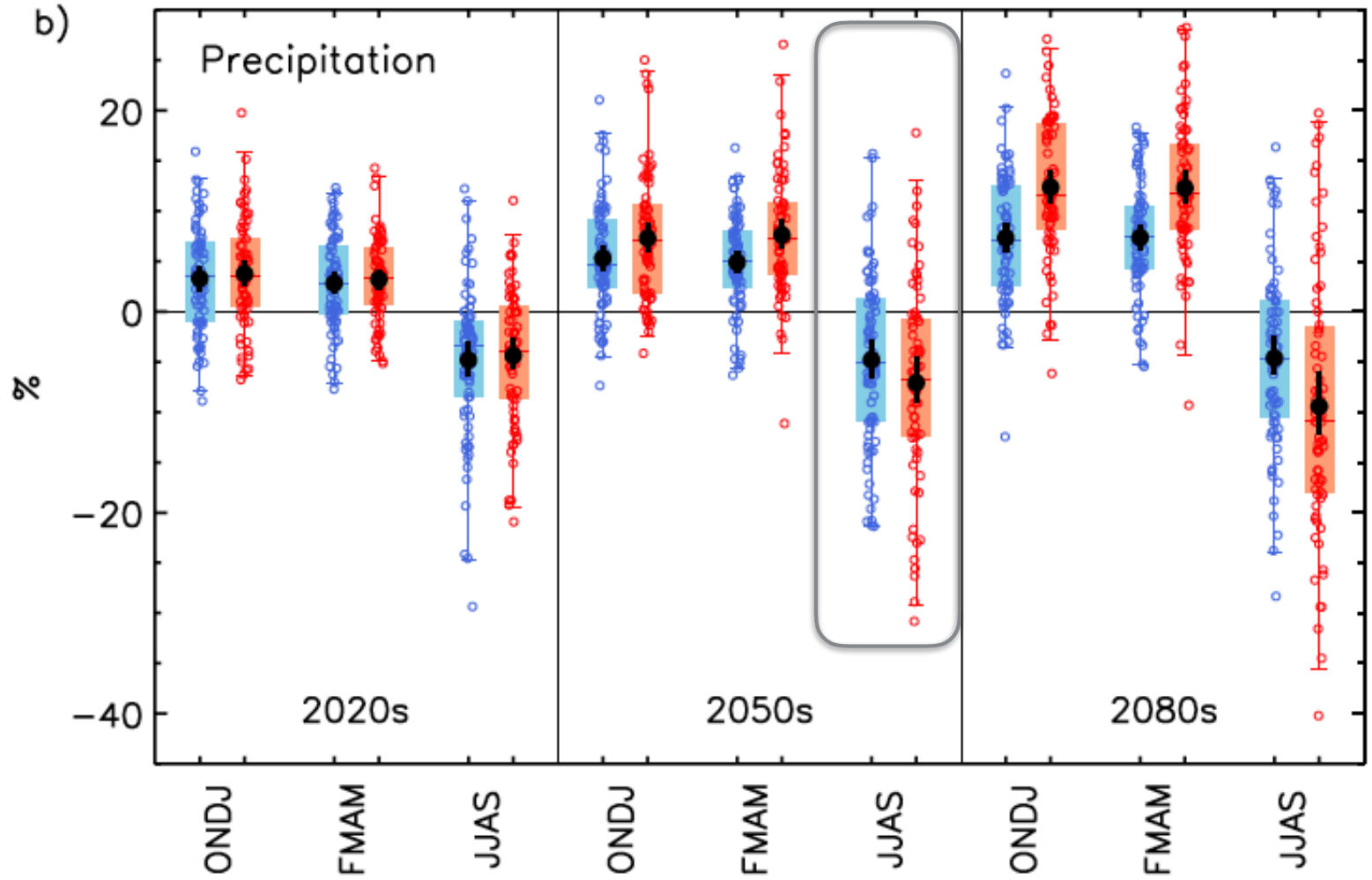
*Departure from 1979-1999 average

Source: Rupp, Abatzoglou. & Mote, Climate Dynamics, 2016

RCP45
RCP85

Red: High Emissions
Blue: Low Emissions

Precipitation changes by season: Columbia Basin



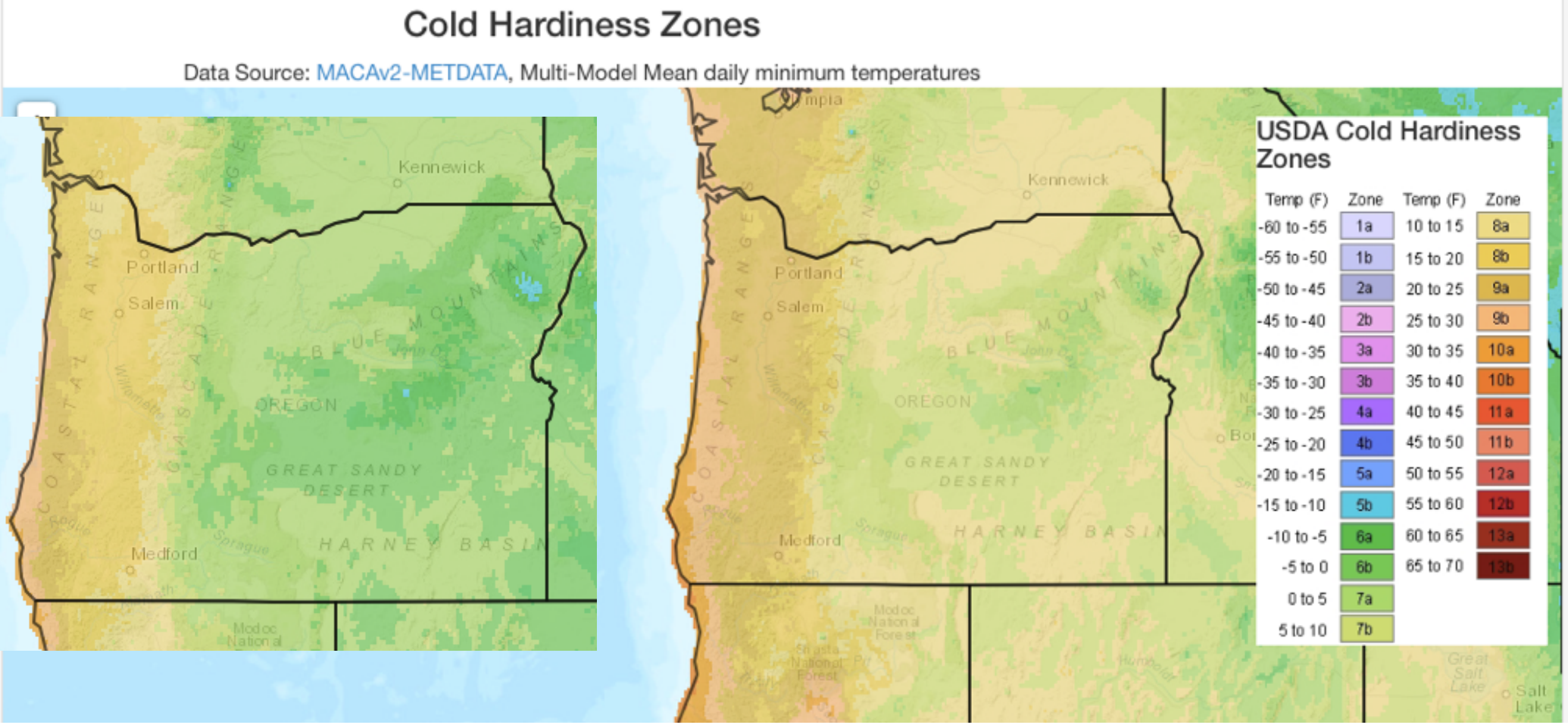
*Departure from 1979-1999 average

Source: Rupp, Abatzoglou. & Mote, Climate Dynamics, 2016

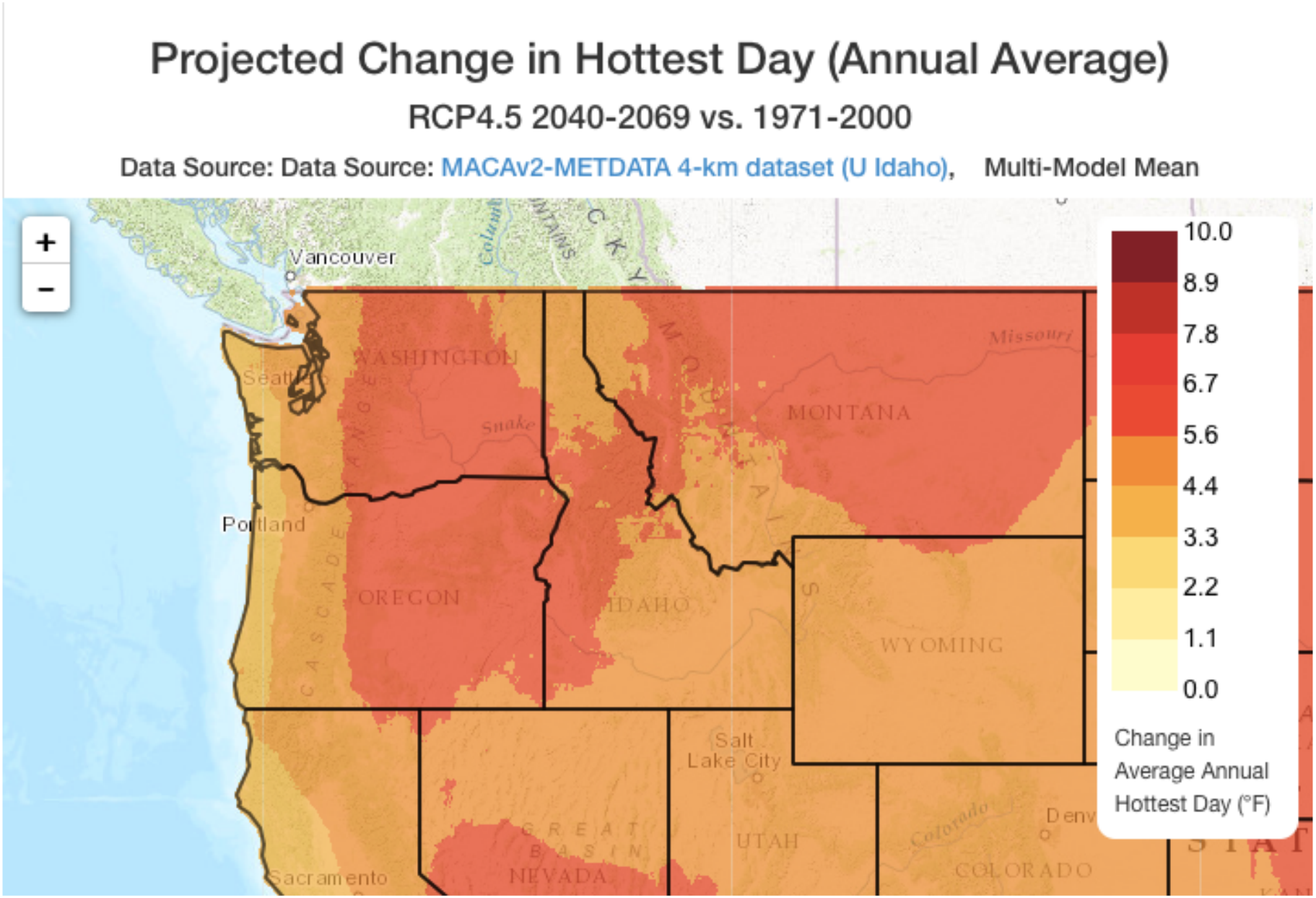
RCP45
RCP85

Red: High Emissions
Blue: Low Emissions

Ag impacts: historic (1971-2000) vs future high emissions (2050s)

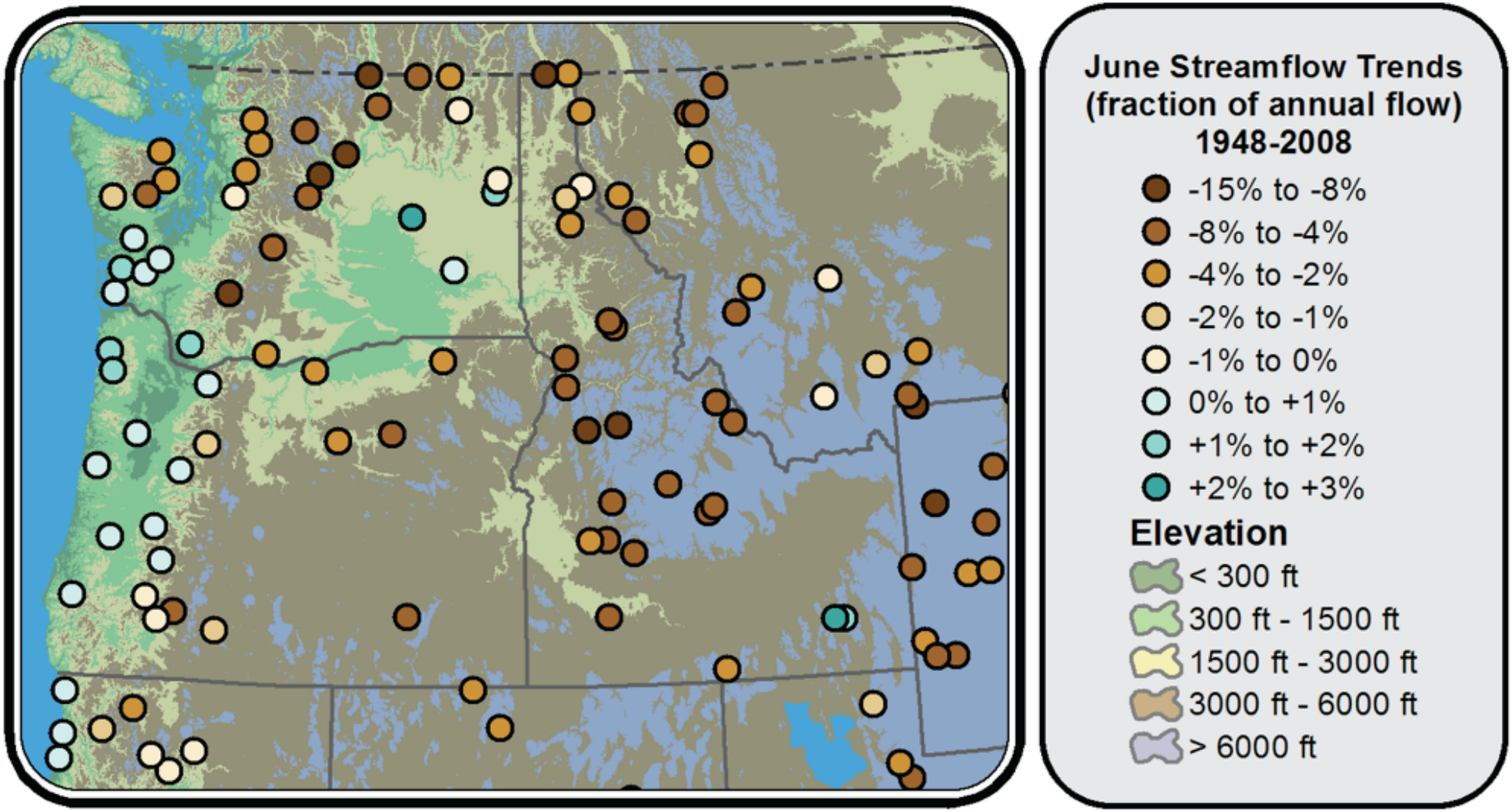


ag, transportation, social impacts



Source: NW Climate Toolbox

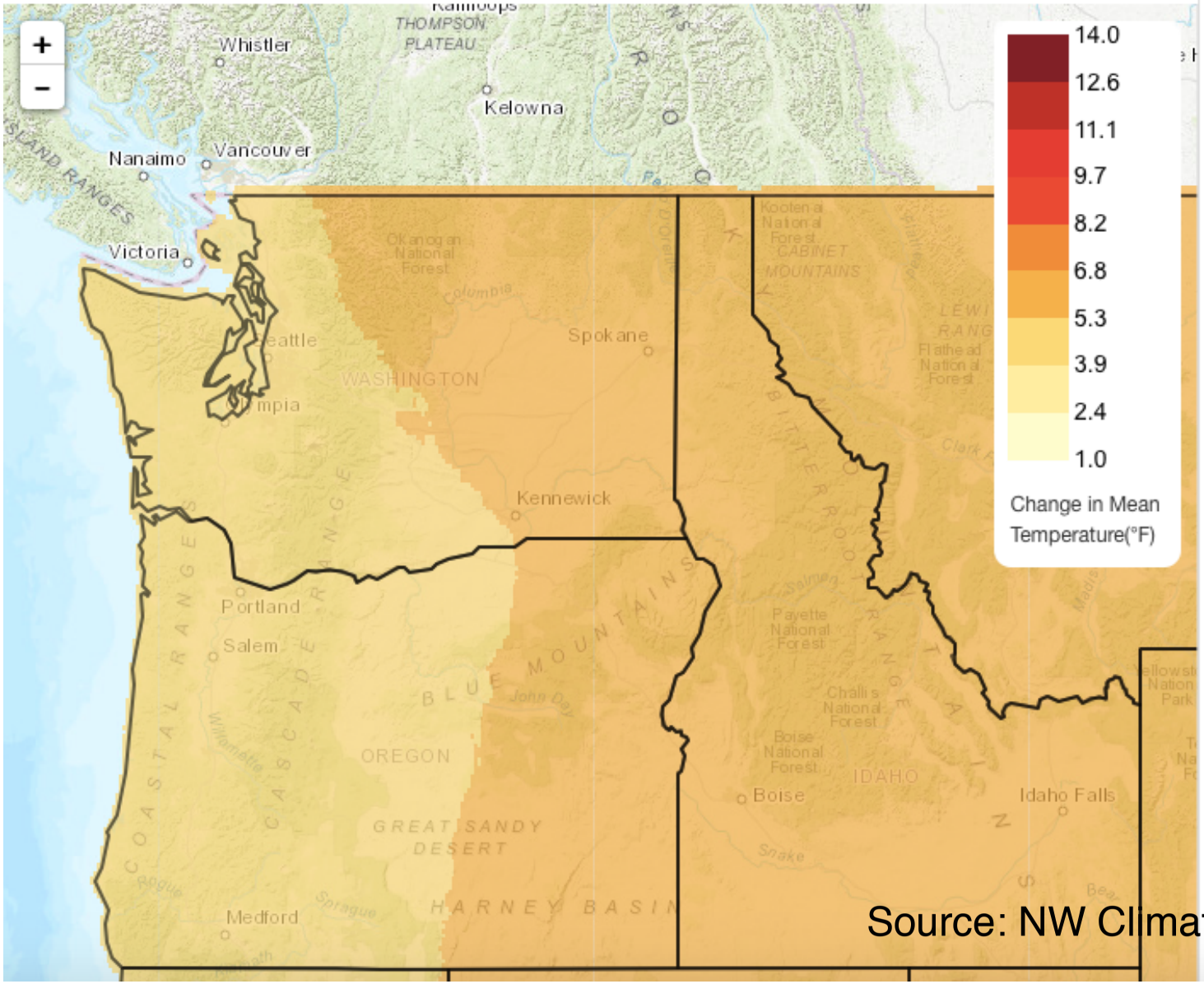
Decreasing summer flow in snowmelt watersheds



Projected Change in Winter (Dec-Jan-Feb) Mean Temperature (°F)

RCP8.5 2040-2069 vs. 1971-2000

Multi-Model Mean

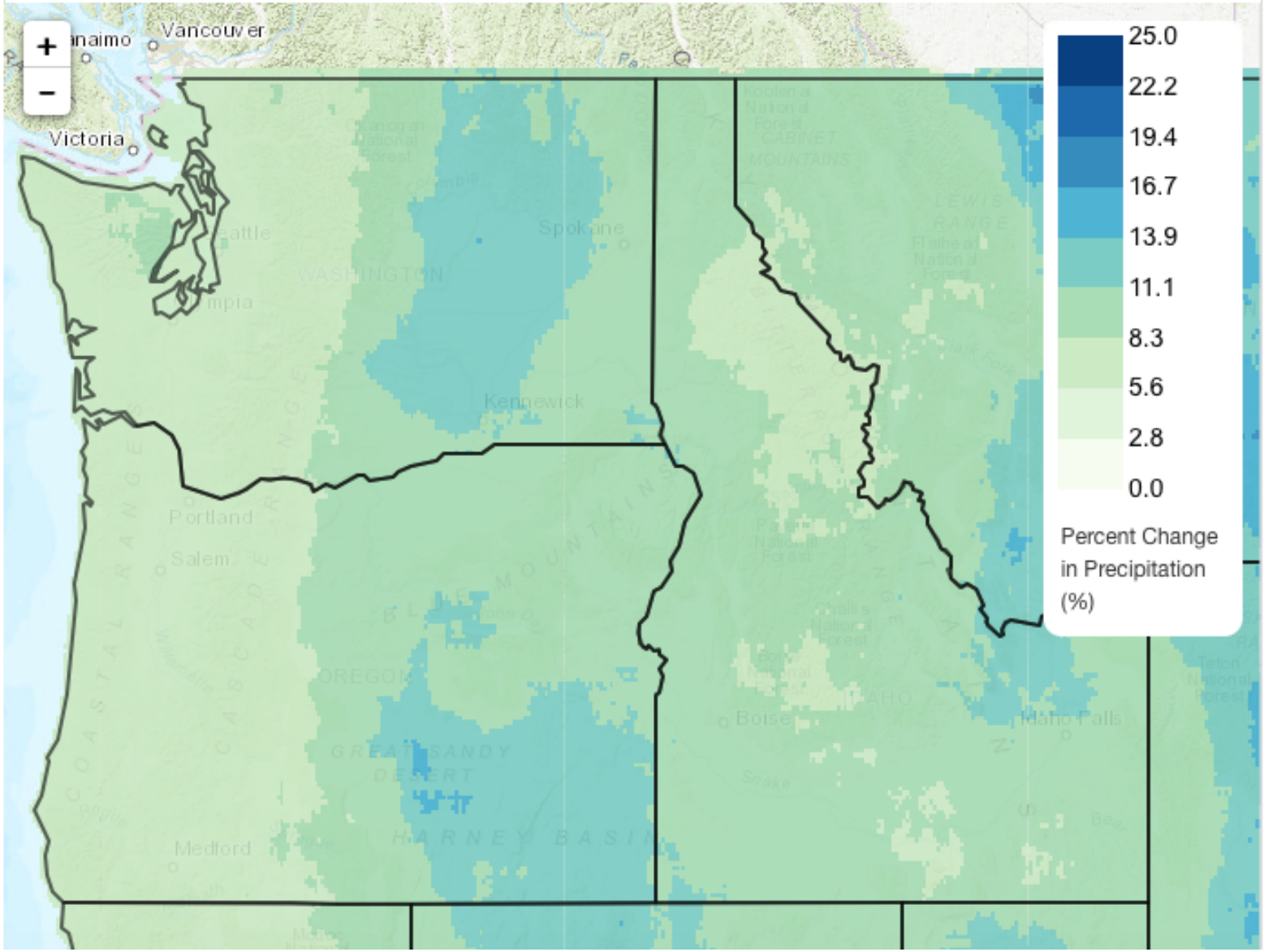


Source: NW Climate Toolbox

Projected Change in Winter (Dec-Jan-Feb) Precipitation (% of Normal)

RCP8.5 2040-2069 vs. 1971-2000

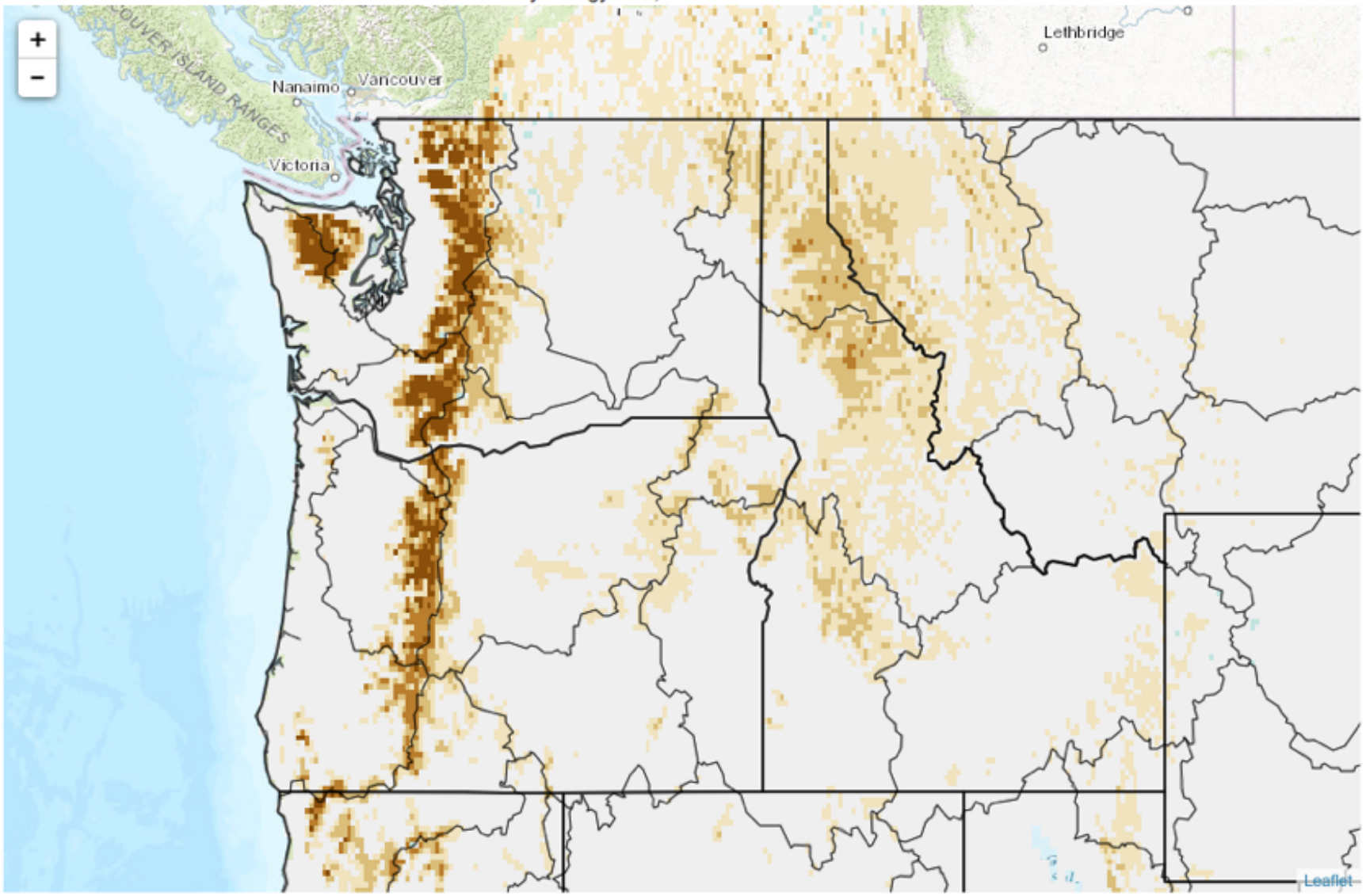
Multi-Model Mean



Projected Changes in April 1st Snow Water Equivalent

RCP8.5 2040-2069 vs. 1971-2000

Data Source: Hydrology: VIC, Multi-Model Mean



Source: NW Climate Toolbox

summary

- climate change will continue to effect Oregonians
- Oregon will continue to warm in all seasons, especially summer
  - fire, snow, agriculture - temperature sensitive, cascading social, economic, and ecological effects
  - reducing global emissions will reduce warming
- big fire seasons in past 15 years tend to be hot, dry summers
- coastal impacts with global sea level rise and coastal flooding, crucial infrastructure at risk
- frame questions to “did climate change make this event/season more likely”

thank you!

@kathiedello

key findings from 2017 report

- climate change will continue to impact the health of Oregonians, especially vulnerable populations,
- Oregon will continue to warm; we can now attribute some regional trends to human activity
- declining mountain snowpack is, and will have significant impacts on water resources
- increased coastal flooding and erosion
- ocean acidification
- shifting climates plus disturbances (fire, insects, diseases) will drive forest change
- short-term gains for agriculture, but long-term dependent on adaptations to heat and water
- recent climate events a practice run for the future