

Moving From Uncertainty to Action: Case Study Examples

Marni Koopman, Climate Change Scientist

We work to prepare communities in a coordinated, synergistic, and ecologically sound manner

Economic Systems



Built Systems



Human Systems



Natural Systems



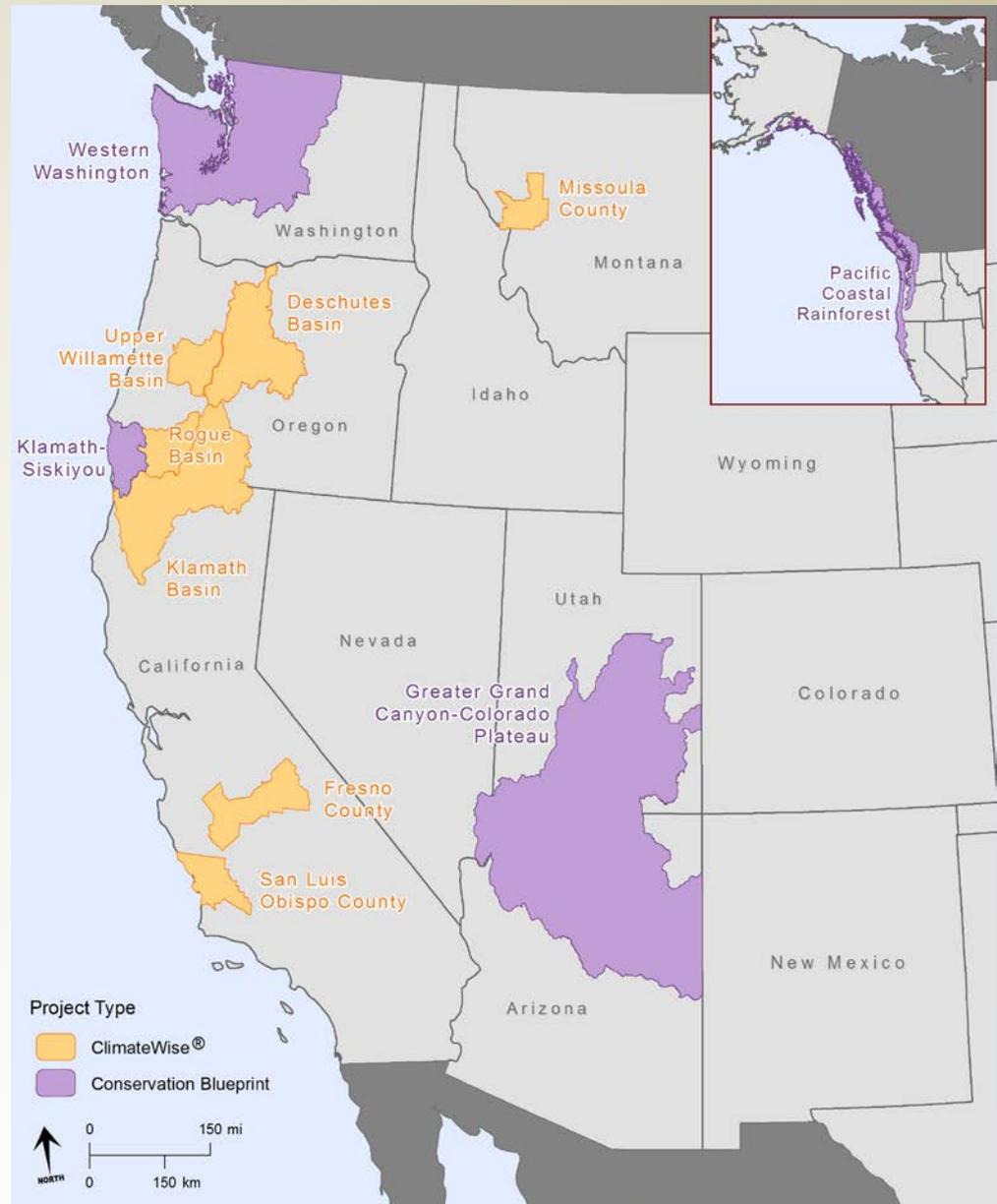
Cultural Systems

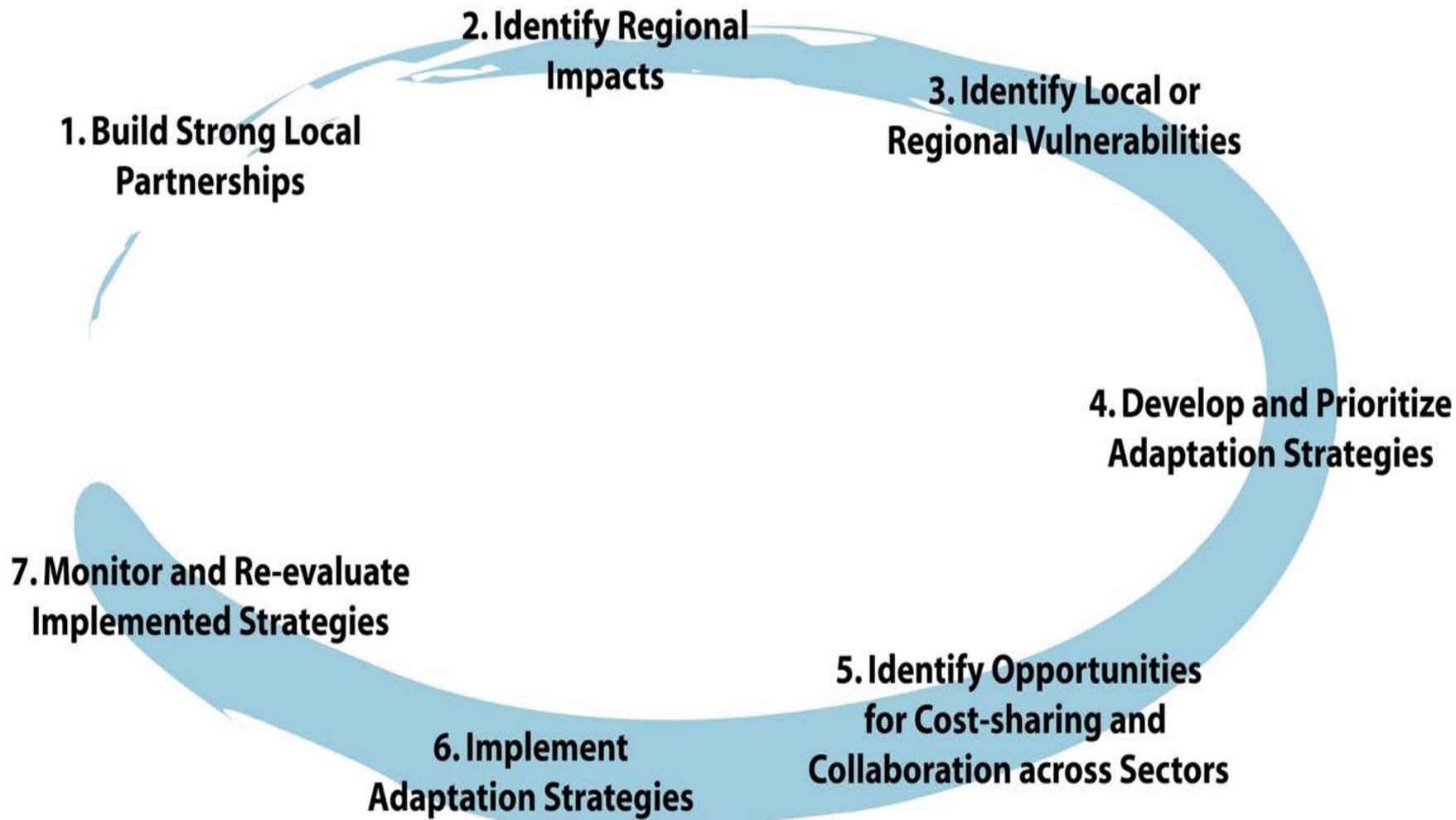


ClimateWise[®]

Helping communities prepare for a changing climate

We use science to help people **PREDICT, REDUCE, and PREPARE** for climate change





Vulnerability Assessment Across Sectors

Resource or population	Likely impact	Exposure	Sensitivity	Adaptive Capacity
Local dam(s)	Increased storm severity and runoff could compromise safety and storage	High exposure to changes in precipitation	Medium sensitivity – only extreme storms will cause overflow or failure	Low because dam received poor marks on its safety inspections and is upstream of residential development
Barrier island wildlife reserves	Sea level rise, storm surge, and increased hurricane risk could lead to loss of areas for breeding and wintering birds (terns, plovers, etc.)	High due to direct impacts from climate change and loss of mangroves	Some species more sensitive than others	Low because of extensive loss of habitat and disturbance
Agriculture	Loss of water availability due to changes in precipitation and higher temperatures	Medium due to irrigation	Some crops more sensitive than others (cotton)	Farmers with access to new technology and resources have greater adaptive capacity
People with asthma and heart disease – specific populations	Increased ozone formation from higher temperatures will cause more heart attacks, asthma, and need for health care services	High in areas with poor air quality	Some populations more sensitive than others (elderly, young)	People without insurance or those far from health care services have lower adaptive capacity

Approach #1: Listening



Approach #2: Risk Assessment



Example: Klamath Basin, OR/CA

Primary impacts

- Loss of important cultural resources for Yurok, Karuk, and Klamath Tribes
- Lower water quality, quantity leading to increased conflict over water for fish and agriculture
- More wildfire impacts to health and safety
- Increased heat stress to cattle/loss of forage



Chronicle / Michael Maloney



Approach #3: Compare to other types of uncertainty

- Year-to-year weather
- Livestock prices/food
- Population growth
- Wildfires
- Forest growth rates
- Static (average) climate



Approach #4: Look for model agreement

JANUARY

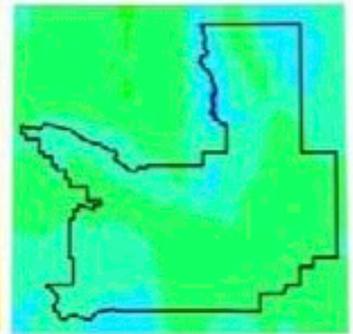
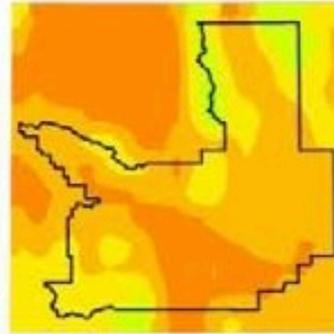
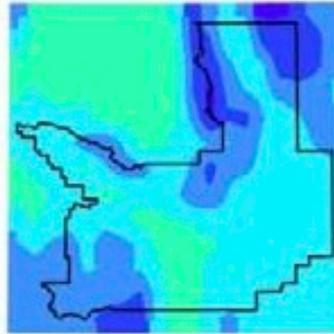
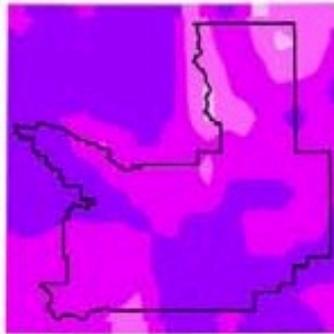
APRIL

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NOVEMBER

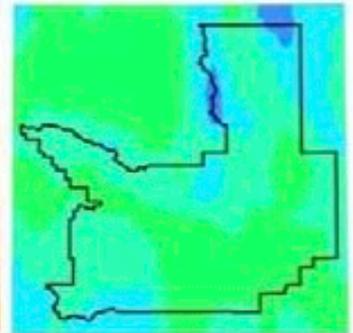
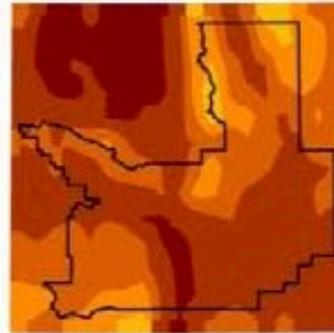
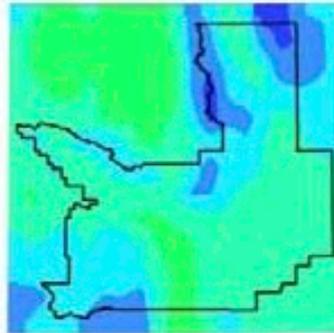
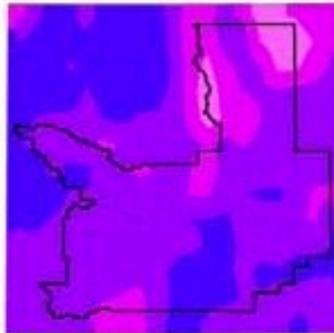
GEOS
INSTITUTE

CSIRO



2075-2085

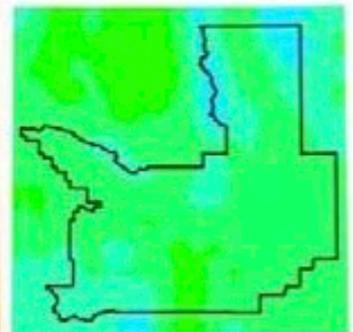
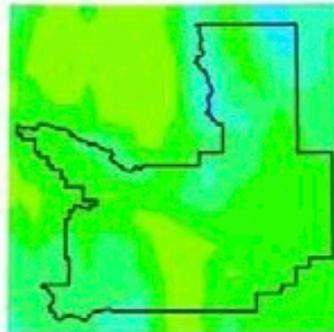
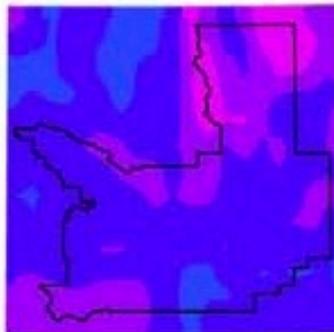
HADCM



Mean Temperature
in Degrees Fahrenheit



MIROC



Approach #4: Look for model agreement

JANUARY

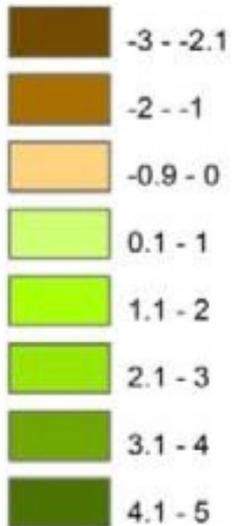
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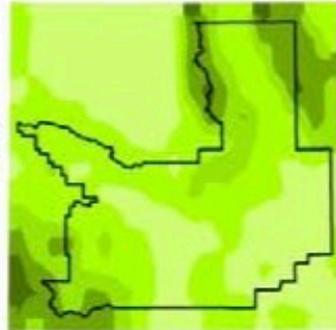
NOVEMBER

GEOS
INSTITUTE

Mean Precipitation
Change in Inches

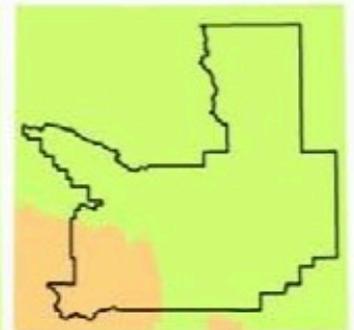


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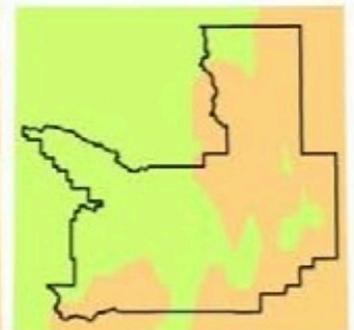
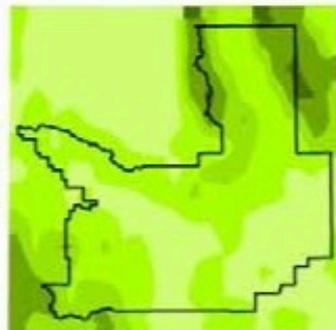


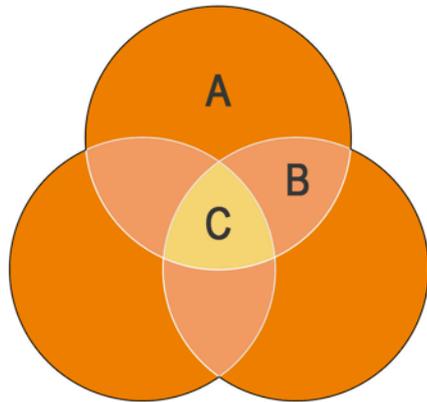
2075-2085

HADCM



MIROC





climate niche predictions based on:

single climate model projection (A) = high uncertainty

overlap of two climate models projections (B) = moderate uncertainty

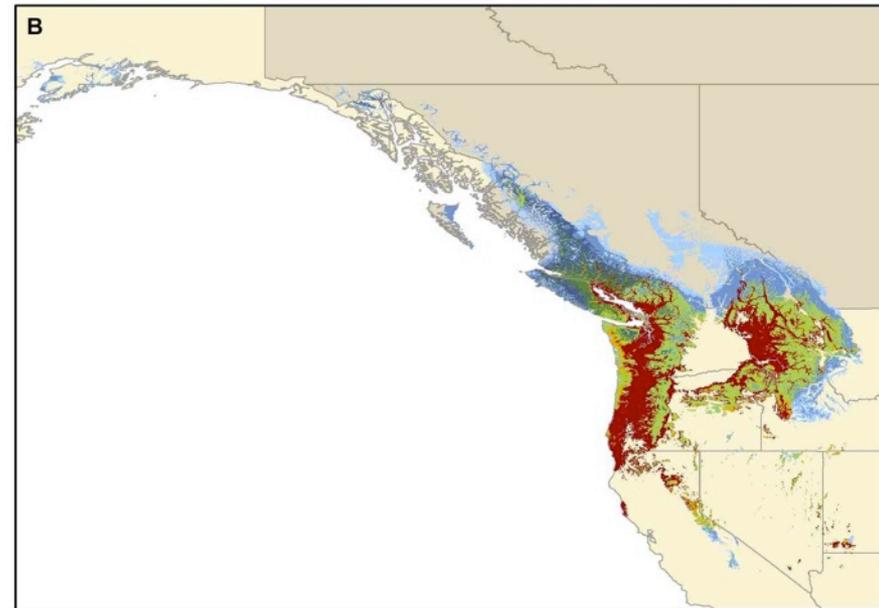
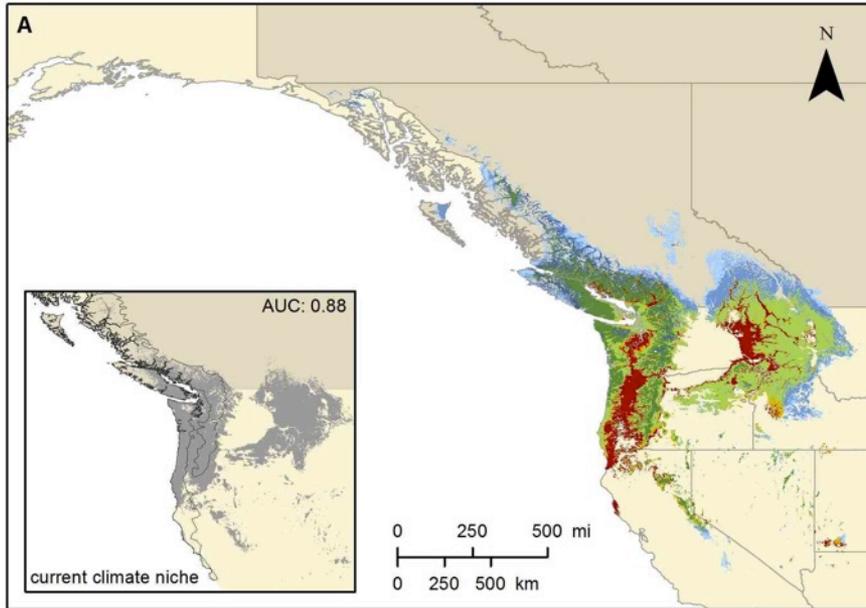
overlap of three climate models projections (C) = low uncertainty

GRAND FIR

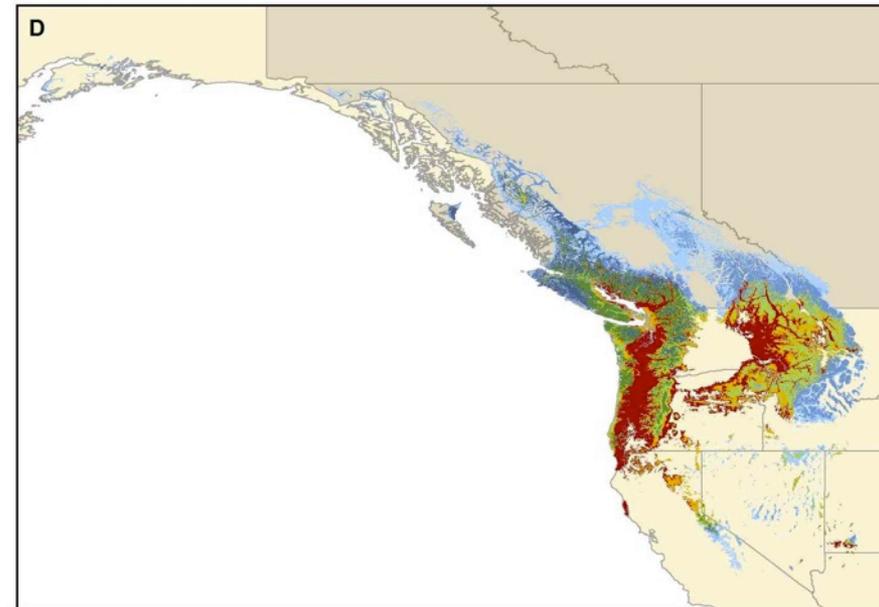
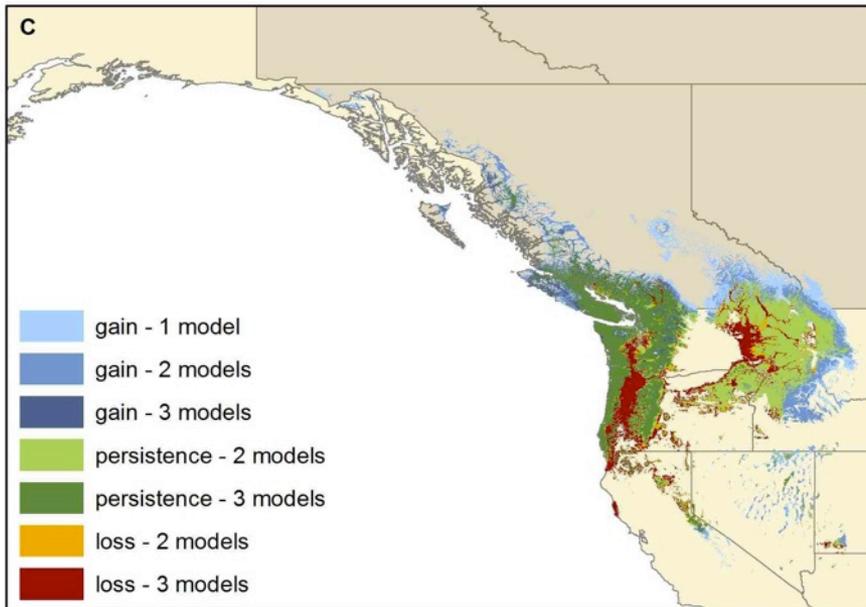
2050

2080

A1B



A2A



Approach #5: Prioritize based on co-benefits



Local Values for Missoula County, MT

- Clean, abundant water
- Outdoor recreation
- Fish and wildlife
- Compassionate community
- Quality of life

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