

A Climate Change Assessment of Vegetation, Fire, and Ecosystem Services for Tribal lands in the Pacific Northwest



Michael Case, Case Research LLC

John Kim, US Forest Service Pacific Northwest Research Station

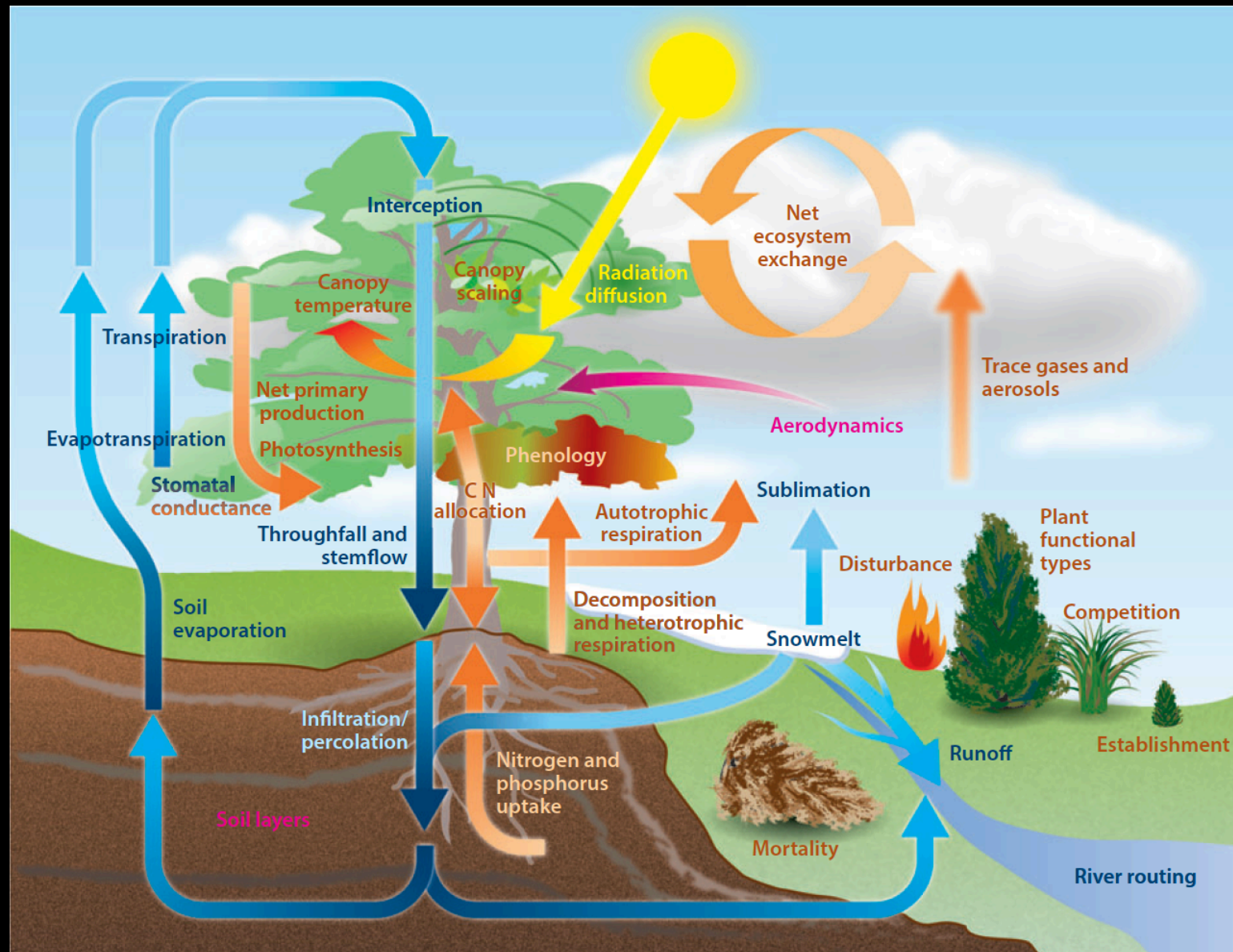
Becky Kerns, US Forest Service Pacific Northwest Research Station

8th Annual Northwest Climate Conference, October 11, 2017, Tacoma, WA

Background



Objective: Apply MC2 to assess changes to vegetation, fire, and ecosystem services



Approach

1. Generate maps of key climate impacts, uncertainties, and mechanisms
2. Consult with tribes to identify how impacts translate to effects on tribal ecosystem services
3. Produce a vegetation-type guide summarizing climate change impacts
4. Collaborate and identify adaptation opportunities (via workshops)

➤ Climate data

NASA Earth Exchange (NEX) Downscaled Climate Projections (NEX-DCP30) downscaled to 1 km²

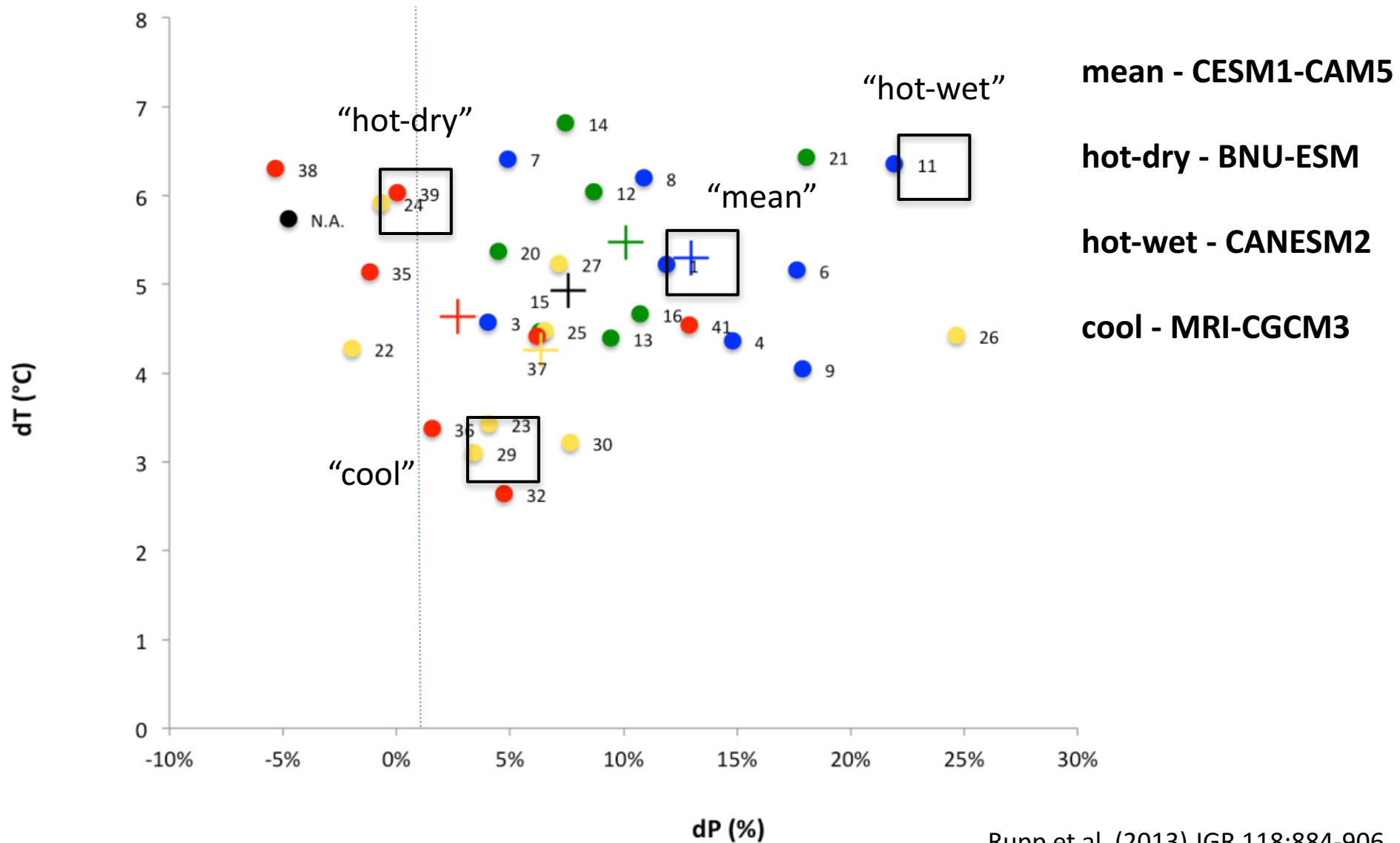
➤ Future scenario

RCP 8.5 (business as usual)

➤ General circulation (climate) models

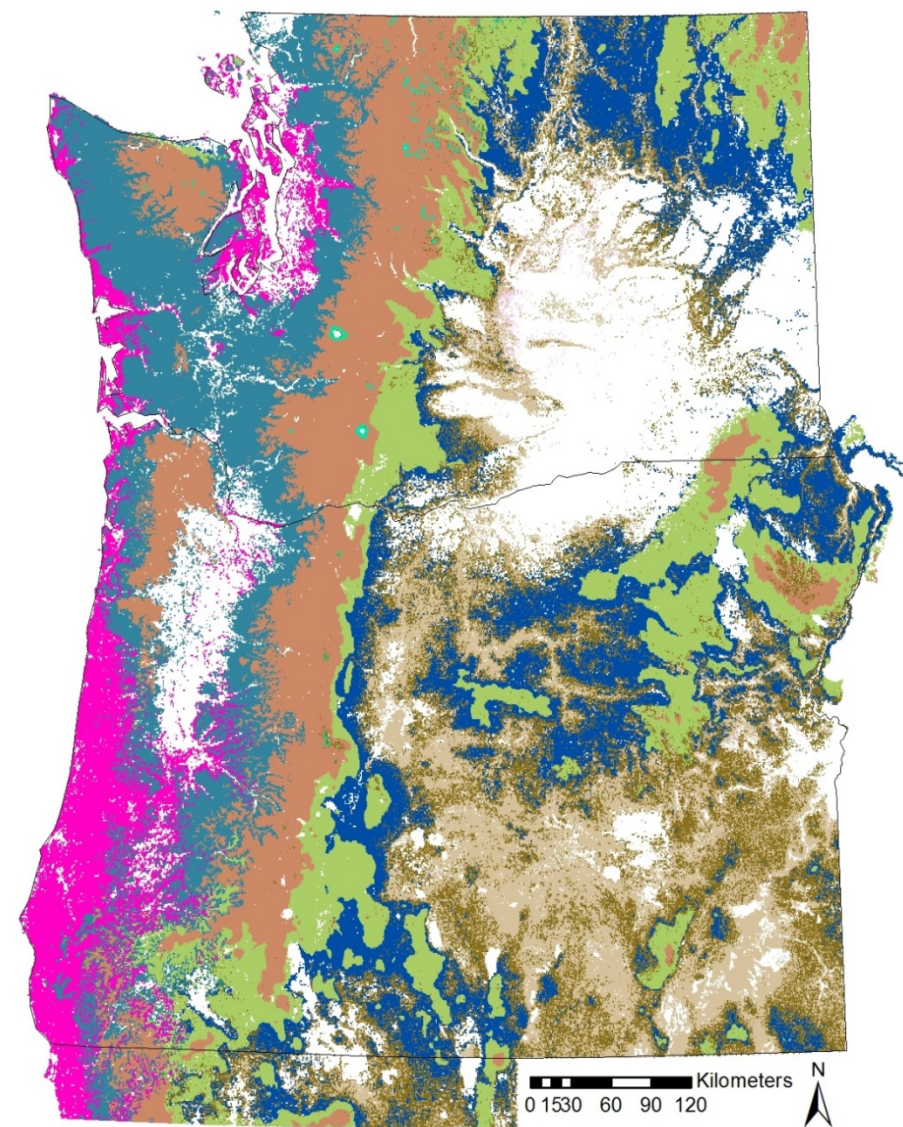


NASA NEX-DCP30 Downscaled Climate Projections RCP8.5, 1961-1990 to 2071-2100



MC2 Vegetation Types

CESM1-Cam5 2080

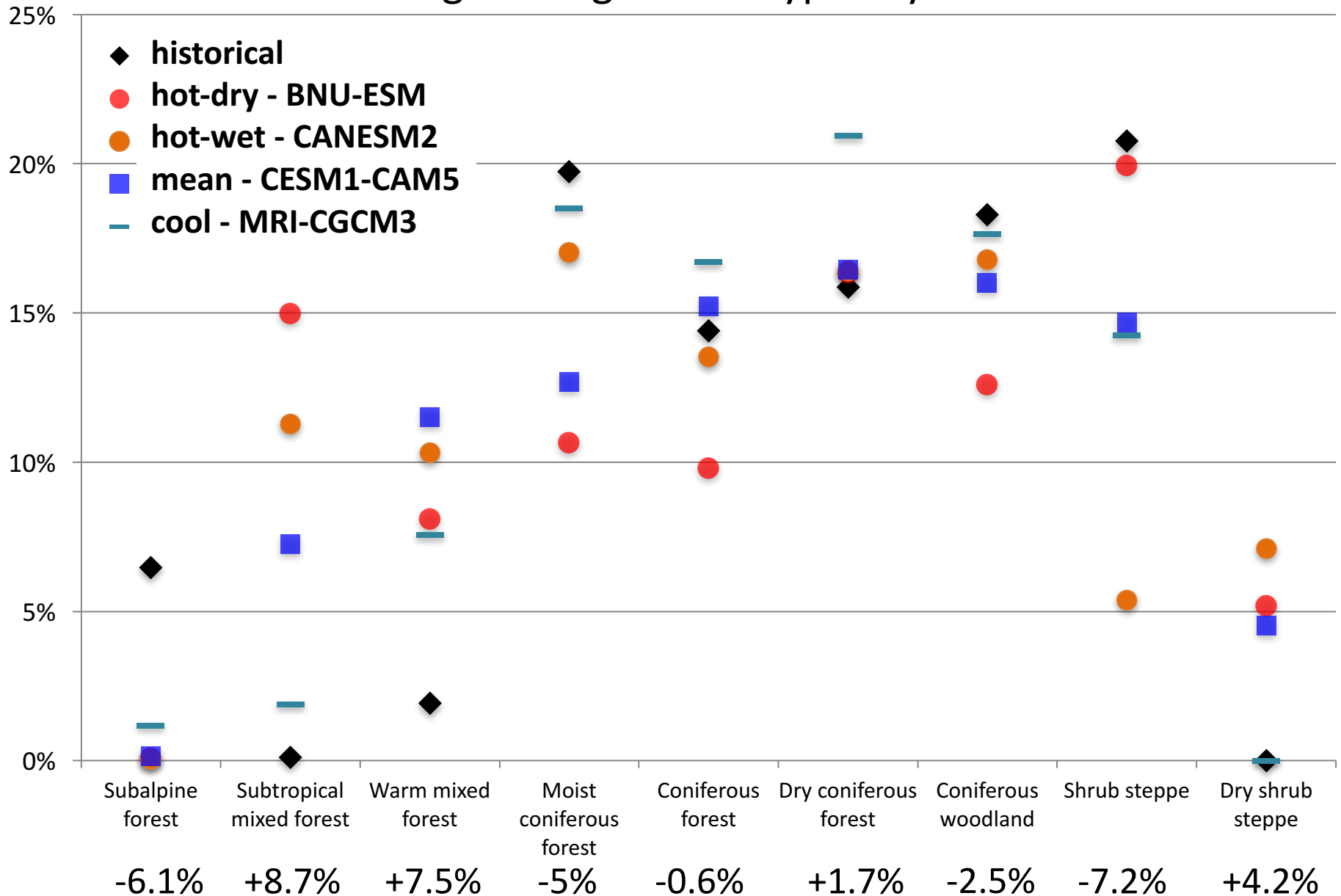


Vegetation Type

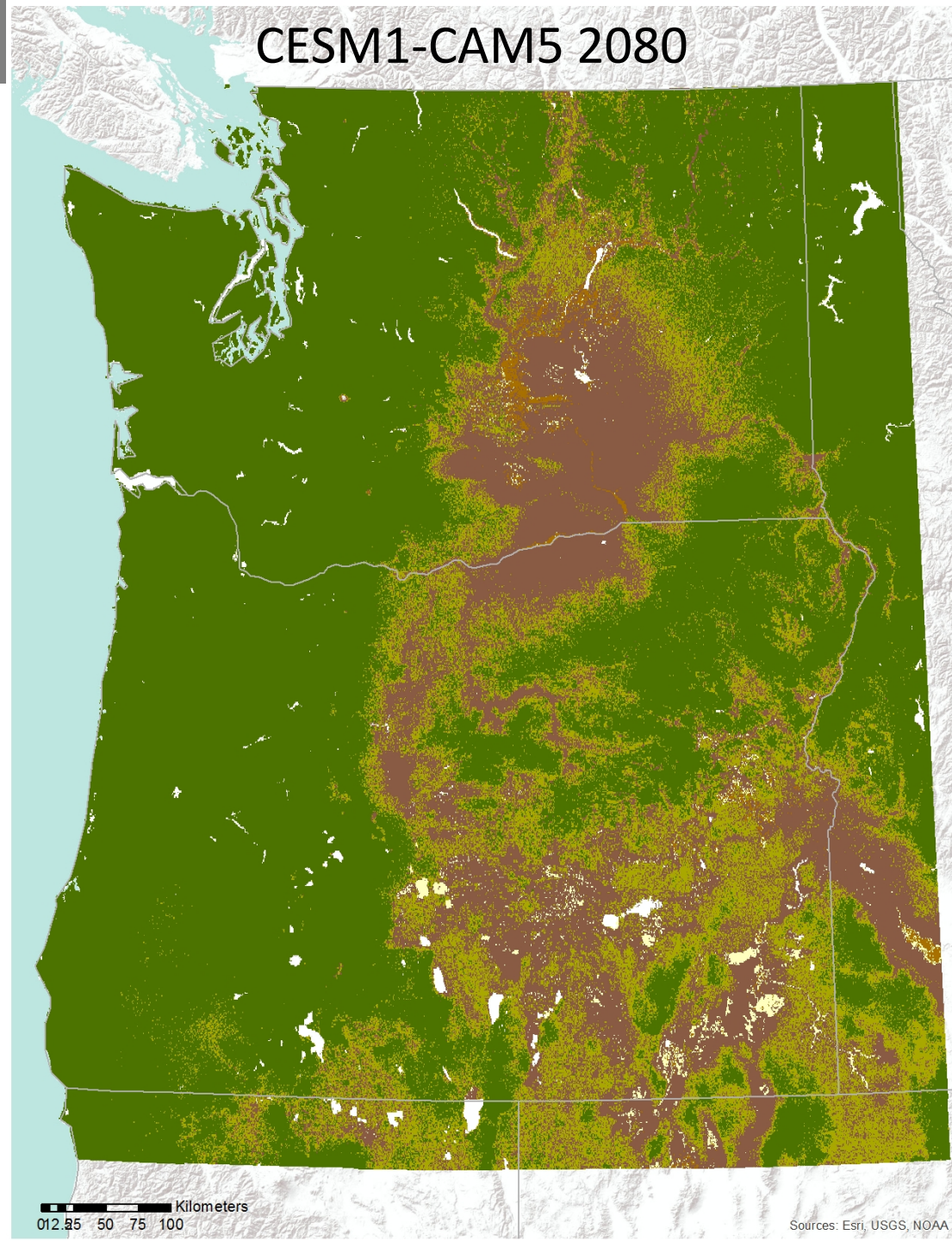
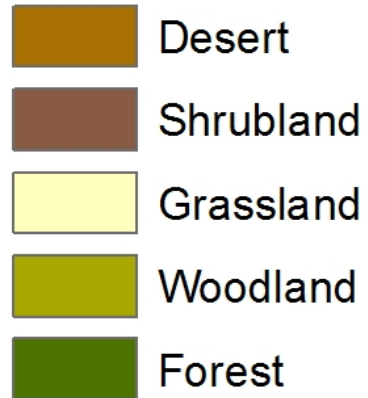
- Alpine tundra
- Subalpine woodland
- Subalpine forest
- Maritime coniferous forest
- Coniferous forest
- Warm mixed forest
- Coniferous woodland
- Cool mixed woodland
- Warm mixed woodland
- Shrubland
- Evergreen broadleaf forest
- Subtropical mixed forest
- Moist coniferous forest
- Dry coniferous forest
- Semidesert shrubland

KEY IMPACTS

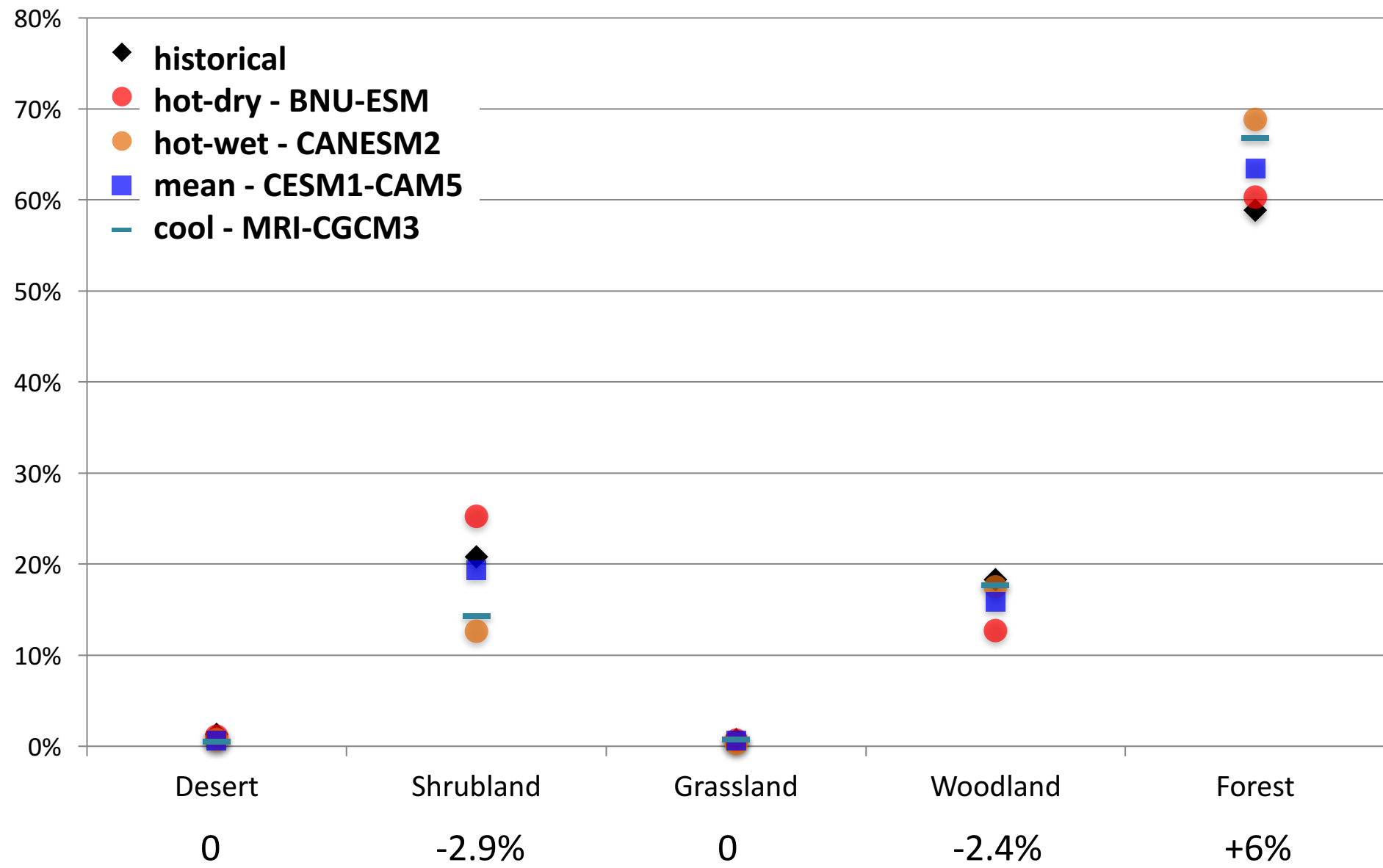
Change in Vegetation Types by 2100



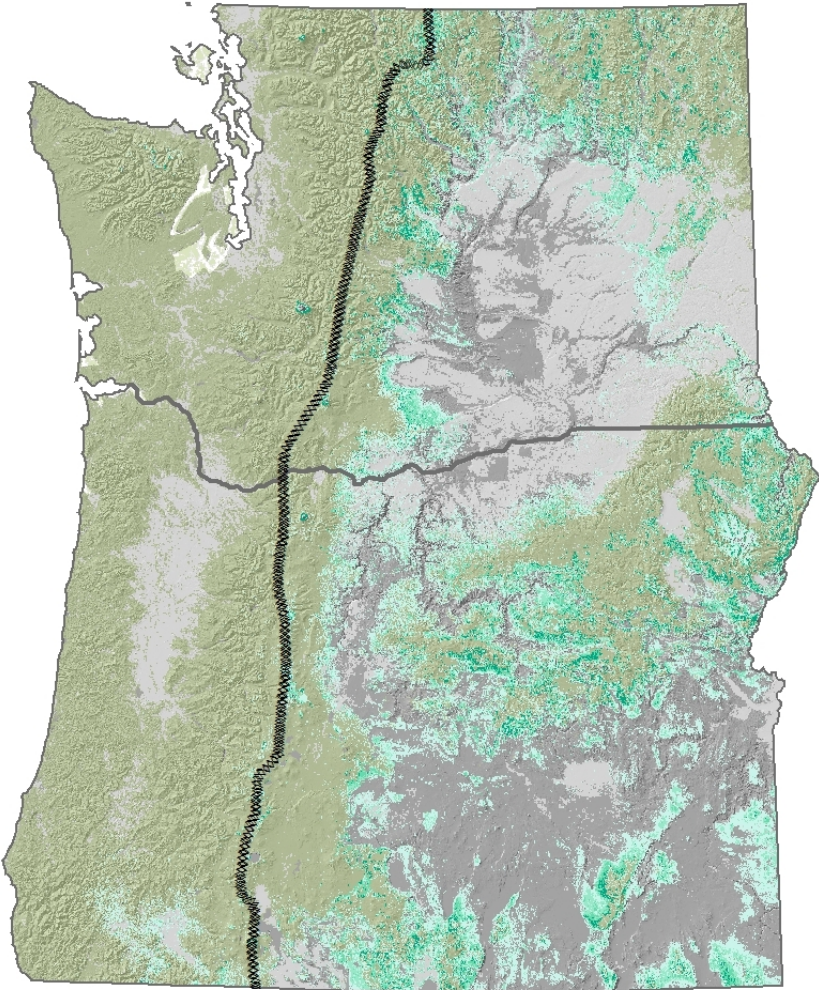
MC2 Biomes



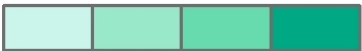
Change in Biomes by 2100



Change in Biome Extent



Predicted forest gain



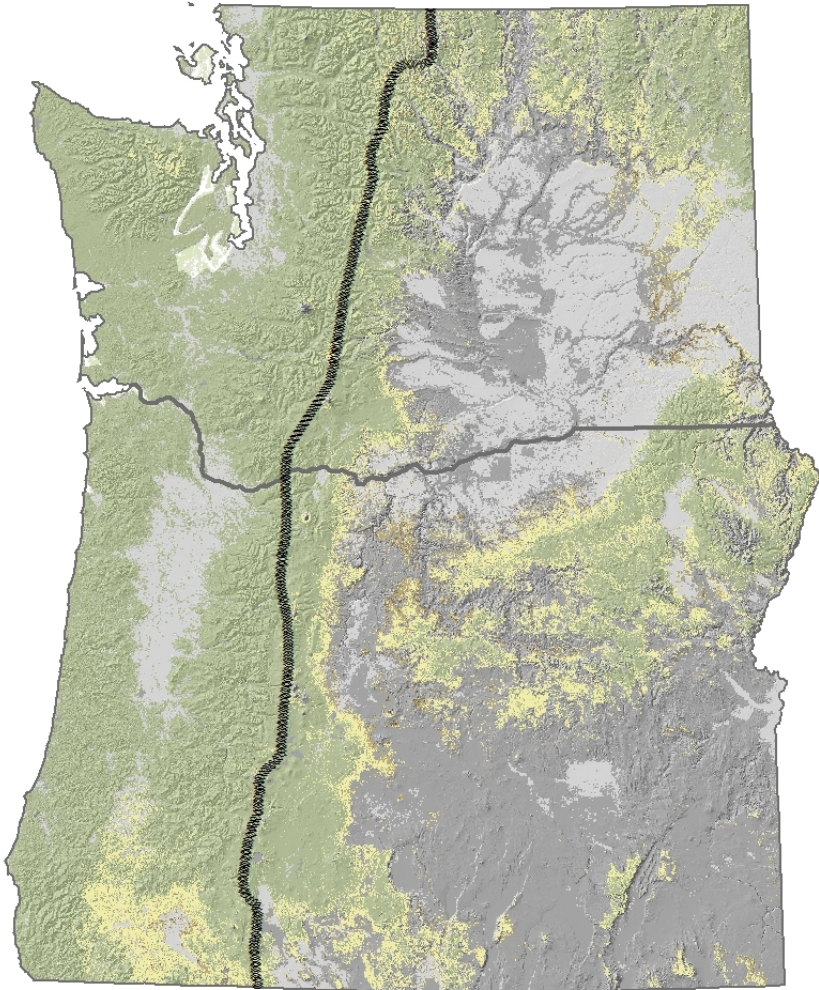
1-8
9-15
16-21
22-28

----- Cascade Crest

Urban/agricultural

Non-forest

Forest



Predicted forest loss



1-8
9-14
15-21
22-27

0 45 90 180 km

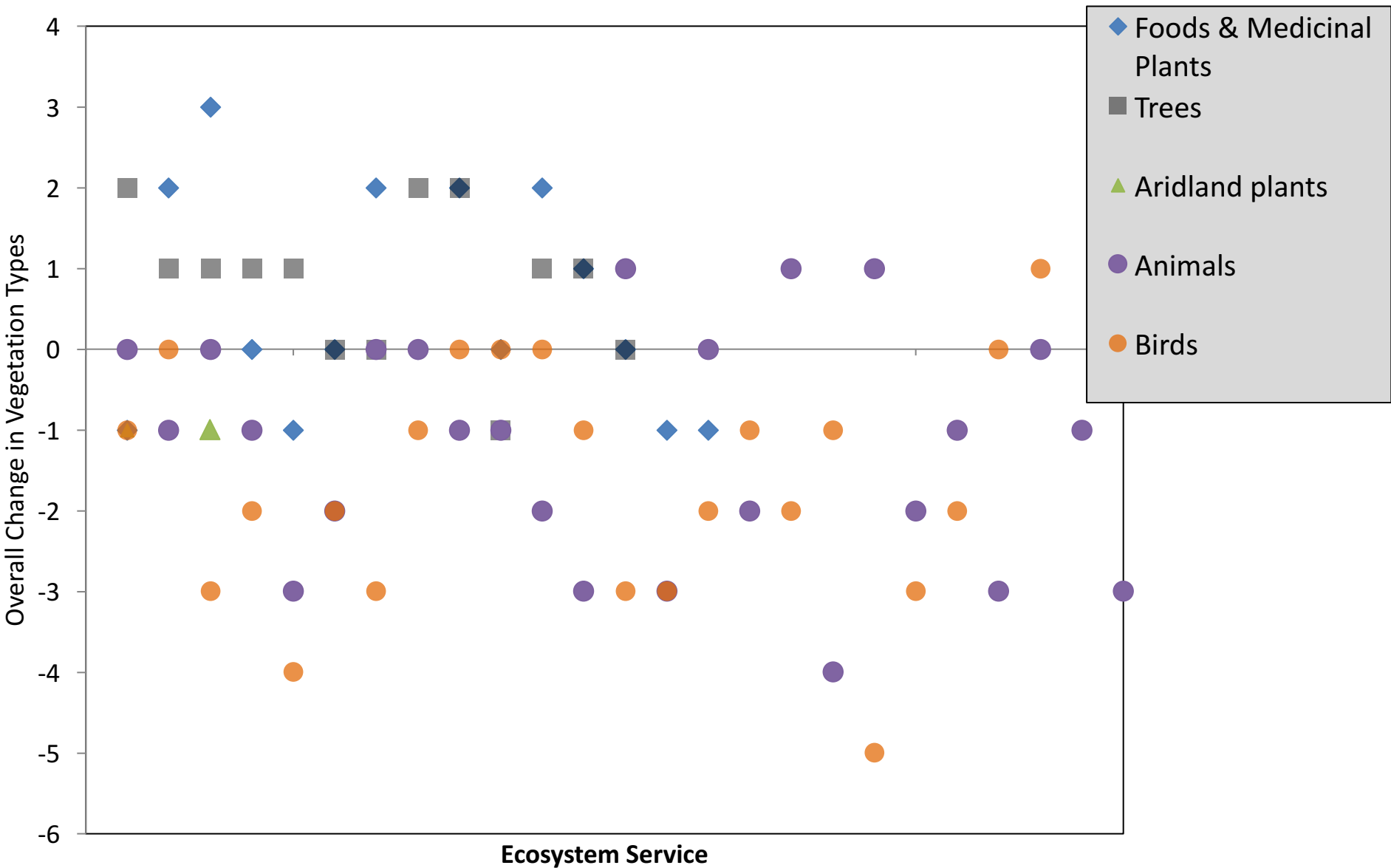


Assessing Impacts to Ecosystem Services

- Identified relevant ecosystem services and important species
- Determined their corresponding vegetation type using a combination of literature reviews and expert elicitation
- Assessed the change to that ecosystem service and/or the habitats they rely on



Impacts to Ecosystem Services & Species



Applying the Results - Workshops

1. Present and discuss how these results may affect relevant and important ecosystem services on tribal lands and sacred places
 - Conduct rapid vulnerability assessment (assess sensitivity, exposure, and adaptive capacity)
2. Interactively identify relevant adaptation strategies through hands-on activities
 - List adaptation actions, challenges to implementation, resources needed, partners, timeframe, where to implement, feasibility of success

October 12 2017
Hotel Murano
Tacoma

December 13 2017
Red Lion River Inn
Spokane

Project Partners – Thank you!

Janean Creighton, Northwest Fire Science Consortium

Carrie Berger, Northwest Fire Science Consortium

Bea Van Horne, USFS Northwest Climate Hub

Holly Prendeville, USFS Northwest Climate Hub

David Redhorse, Bureau of Indian Affairs

Anna Schmidt, Bureau of Indian Affairs

Robert Compton, Bureau of Indian Affairs

Eliza Ghitis, Northwest Indian Fisheries Commission

Robert Jones, Northwest Indian Fisheries Commission

Kathy Lynn, PNW Tribal Climate Change Project

Preston Hardison, Tulalip Tribes

Bill Fish, The Confederated Tribes of the Warm Springs

Jonathan Treasure, The Confederated Tribes of the Warm Springs

Seth Book, Skokomish Indian Tribe

Brittni Kilborn, Bureau of Indian Affairs

Meagan Flier, Confederated Tribes of Grand Ronde

Samantha Chisholm Hatfield, Confederated Tribes of Siletz

Stacy Schumacher, Confederated Tribes of the Umatilla Indian Reservation

Scott Hauser, Upper Snake River Tribes Foundation

Questions

