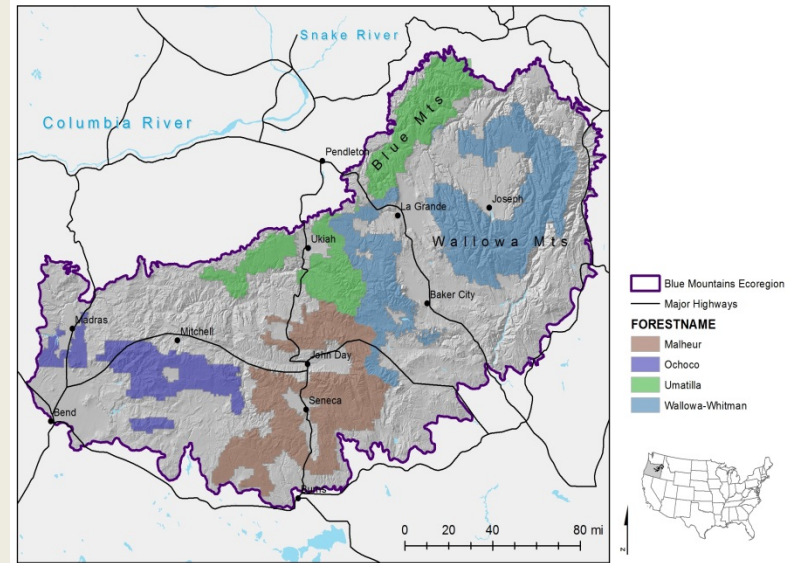


Blue Mountains Adaptation Partnership

Preparing for climate change through science-management collaboration

Climatic Change and Upland Vegetation Assessment Summary for MtSeon Meeting March 4, 2015

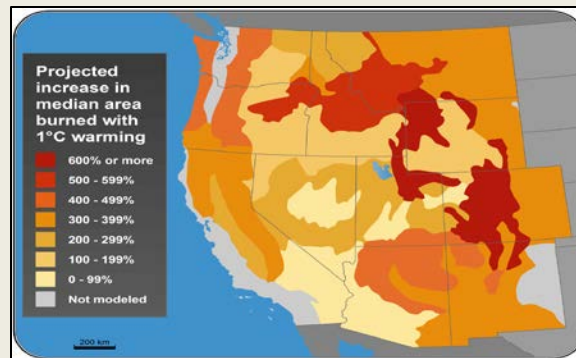
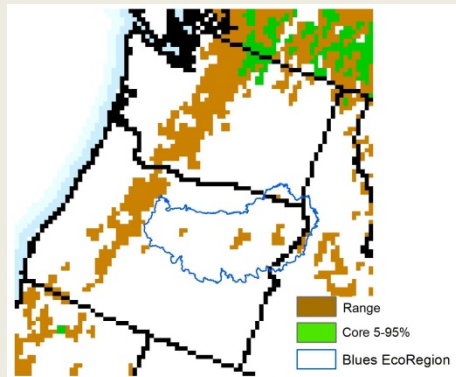
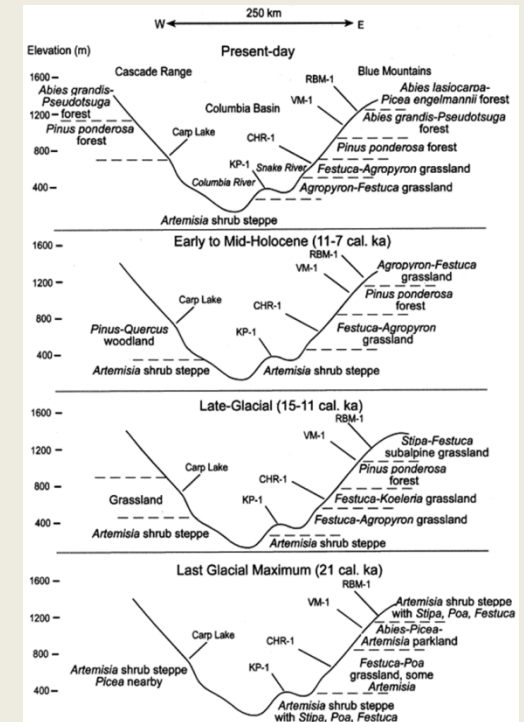
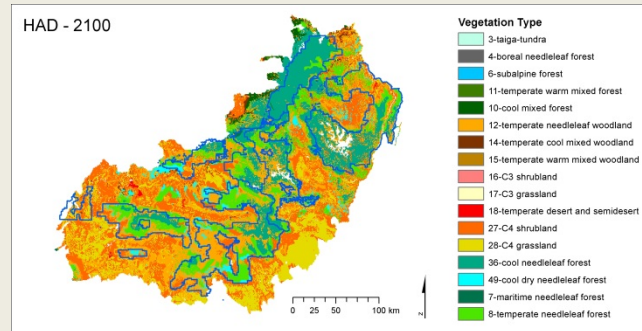
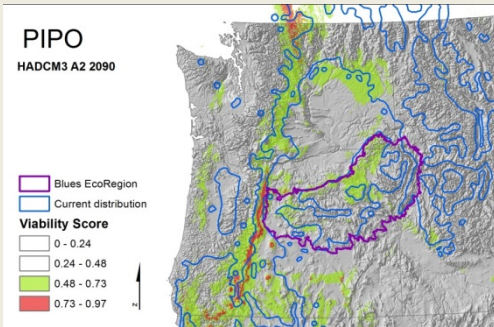


**Becky Kerns, David C Powell, Sabine Mellmann-
Brown, Gunnar Carnwath, John Kim**

USFS Pacific Northwest Research Station

Objectives

To provide an assessment of the potential climate change effects for uplands vegetation in the ecoregion using information from the literature (recent studies, paleoecological data) and output from simulation models.

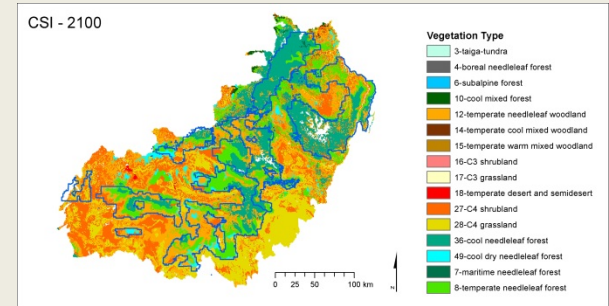
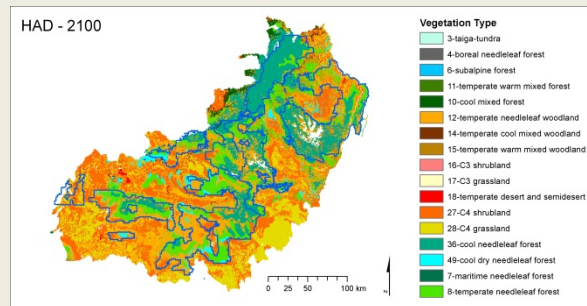
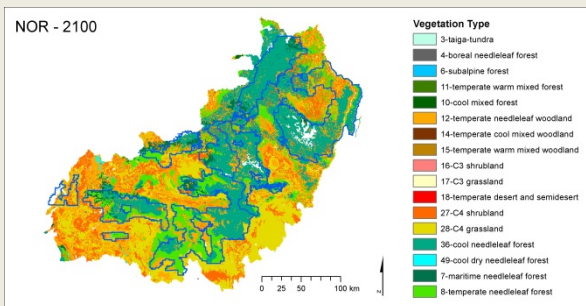
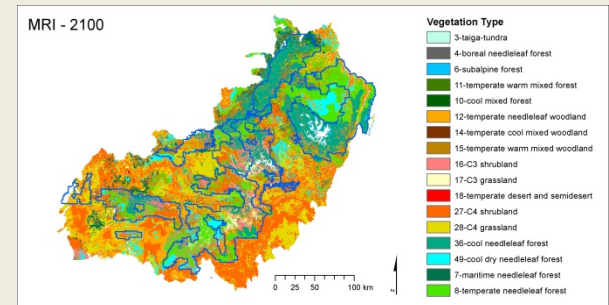
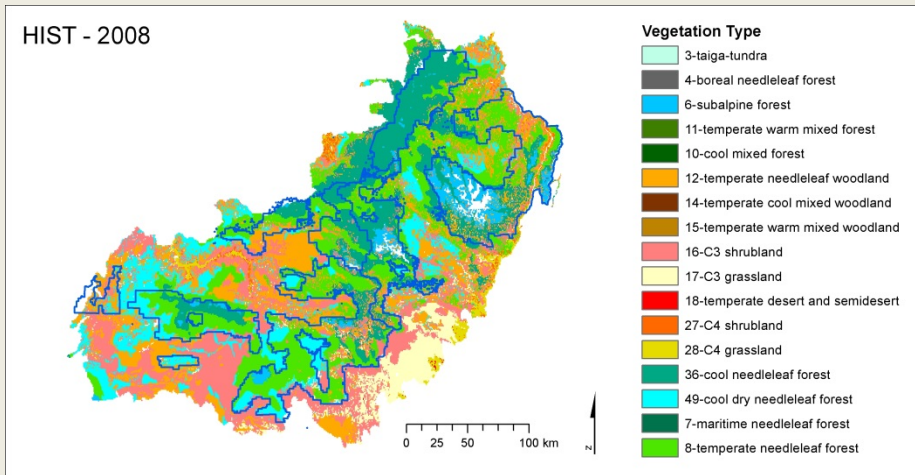


Models

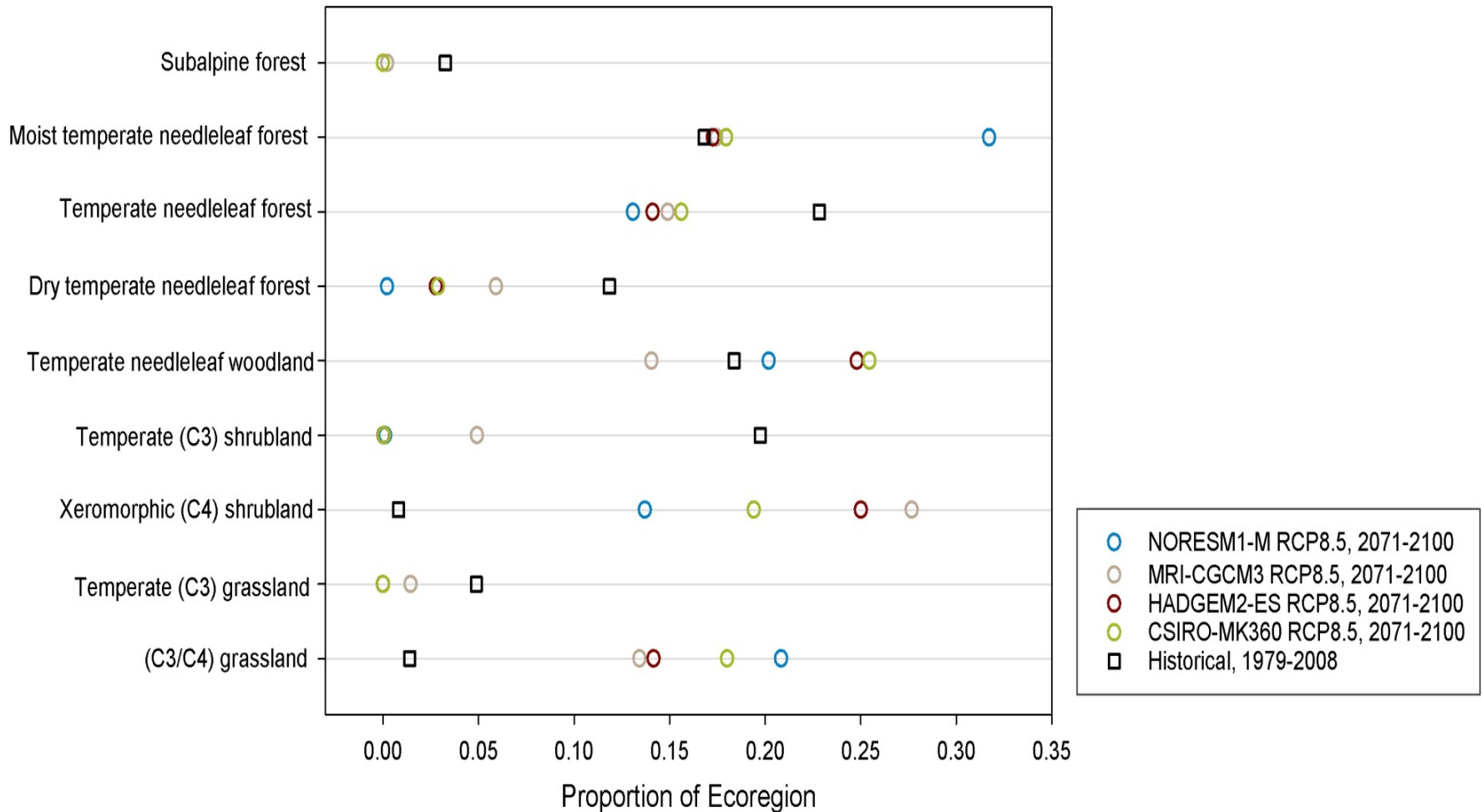
- **Many available models used (SDMs)**
 - SDMs not that helpful – everything contracts!
- **Dynamic global vegetation model MC2 – specifically calibrated for the ecoregion using four scenarios from CMIP5, RCP 8.5**

MC2

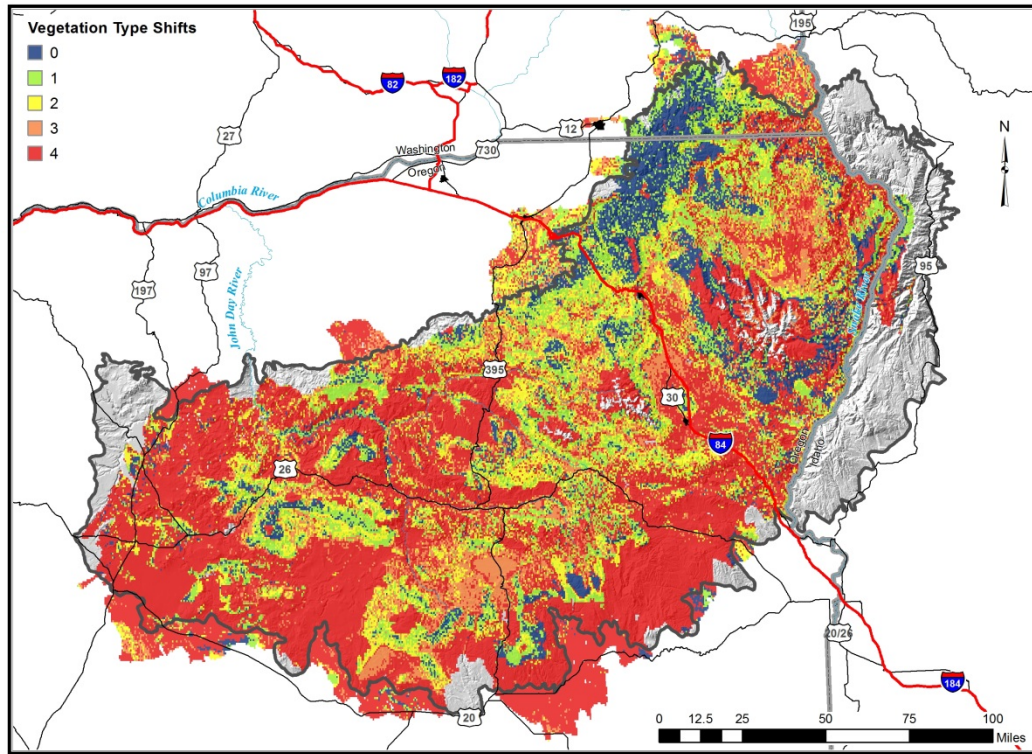
- Relatively fine spatial scale (800m grid) but coarse biological scale (biomes)



MC2 Summary

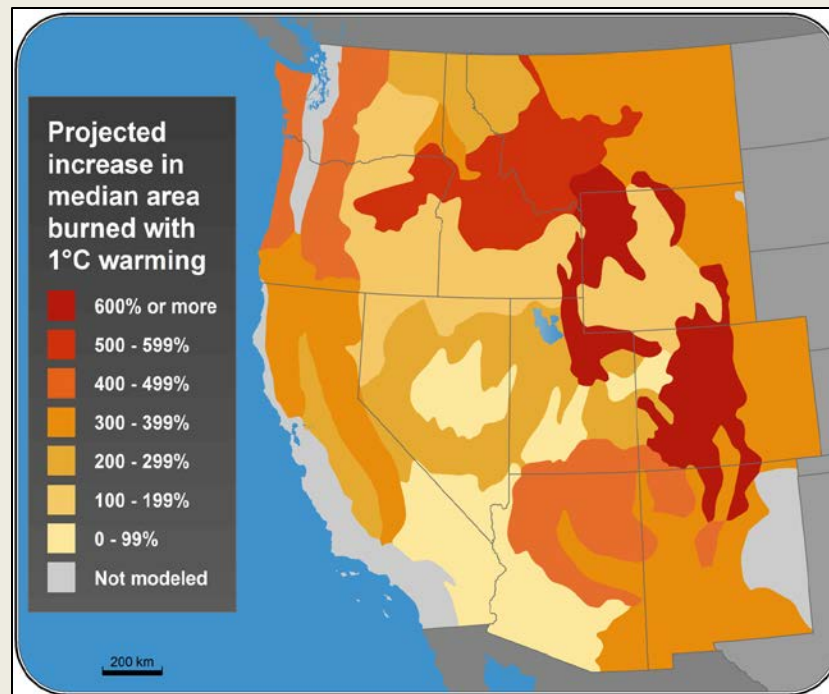


MC2 Model Agreement



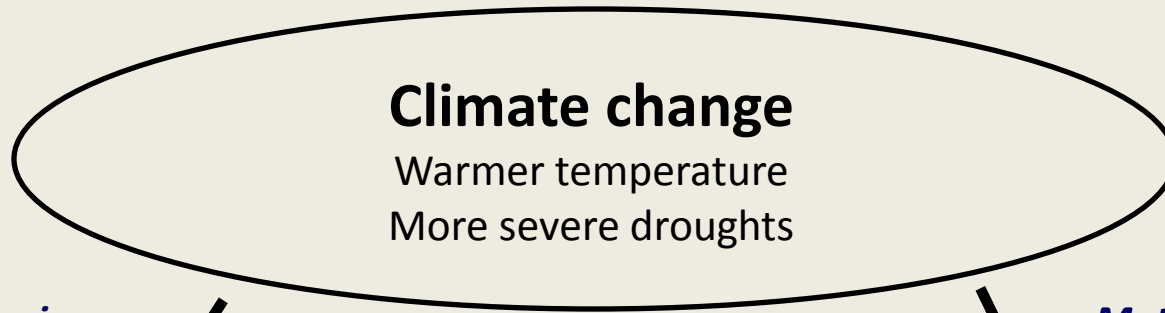
Summary

- **Disturbance will often be the major catalyst for vegetation change; future climate will amplify conditions that favor wildfire, insect outbreaks and invasive species**



([Climate Central 2012](#))

Disturbance drives ecosystem change



Fire resets succession, alters temporal scale of fire effects.

Mature trees buffer effects of warmer climate.

New disturbance regimes

Fire season ↑
Area burned ↑
Extreme events ↑
Insect and disease activity ↑

The disturbance pathway is faster

Habitat changes

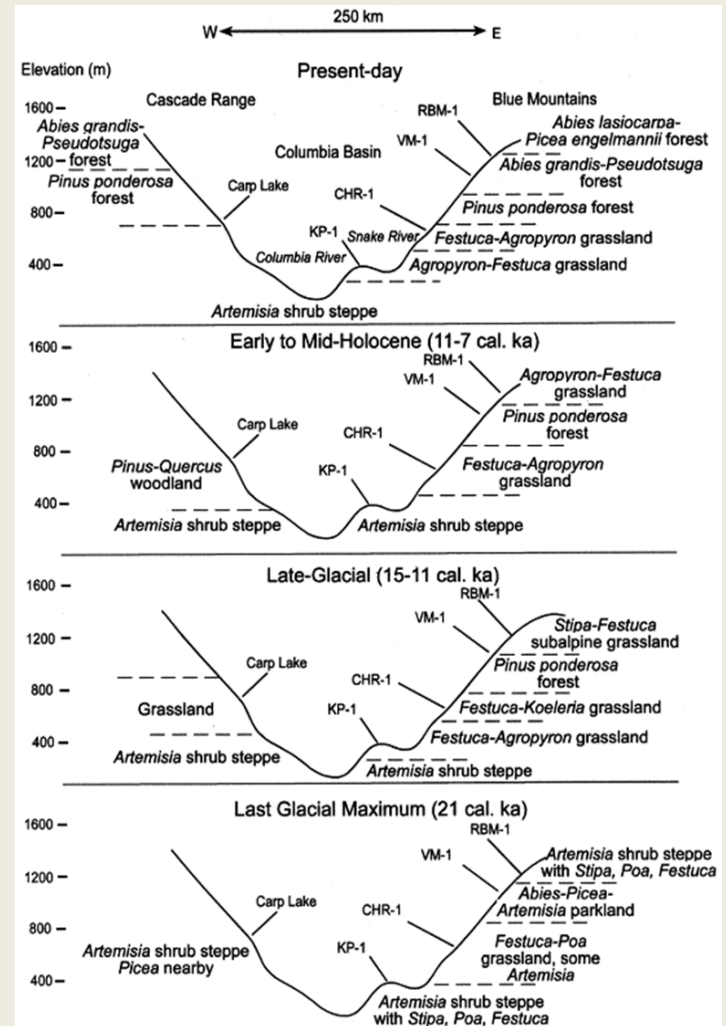
Landscape homogeneity ↑
Fire-adapted species ↑
Forest cover ↓
Species refugia ↓

Species responses

Annuals and weedy species ↑
Deciduous and sprouting species ↑
Fire-sensitive species ↓
Specialists with restricted ranges ↓

Summary

- Species with life histories suitable for frequent disturbance and stressed environments will be more dominant
- Pine and sagebrush may increase, but found at higher elevations
- Forest steppe ecotone may move north and up in elevation



Summary

- **Subalpine systems most vulnerable – may be replaced by lower elevation moist forests or high elevation grasslands, pine, or pine or Douglas-fir woodlands**



Summary

- **Juniper woodlands, which have been increasing in recent decades, may be reduced if more longer and drier summers leads to more wildfire.**
- **Grasslands and shrublands will increase across the landscape; shift to more drought tolerant species (arid bunchgrasses or even C4 species)**
- **Exotic species, including exotic annual grasses, will increase in abundance and extent.**

