


Climate-Related Risks for Western Forests

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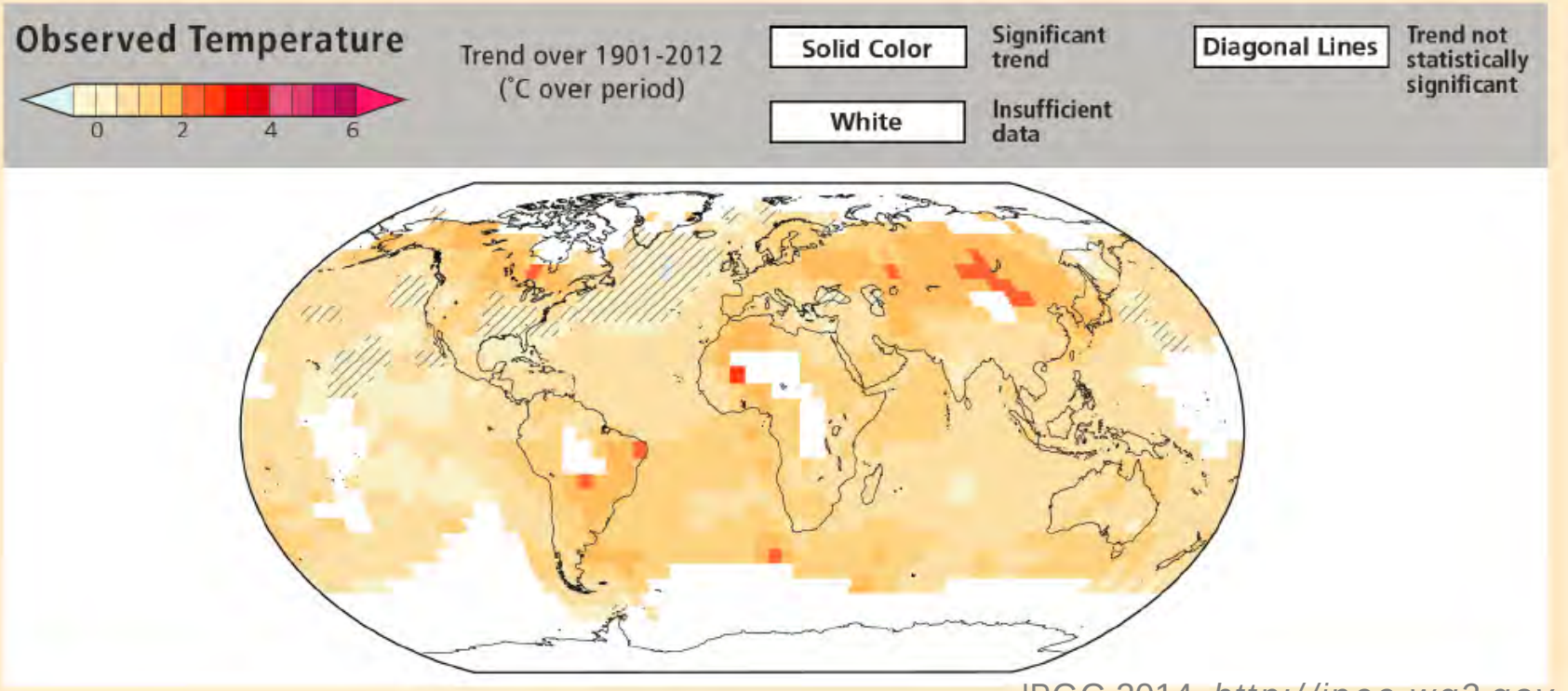
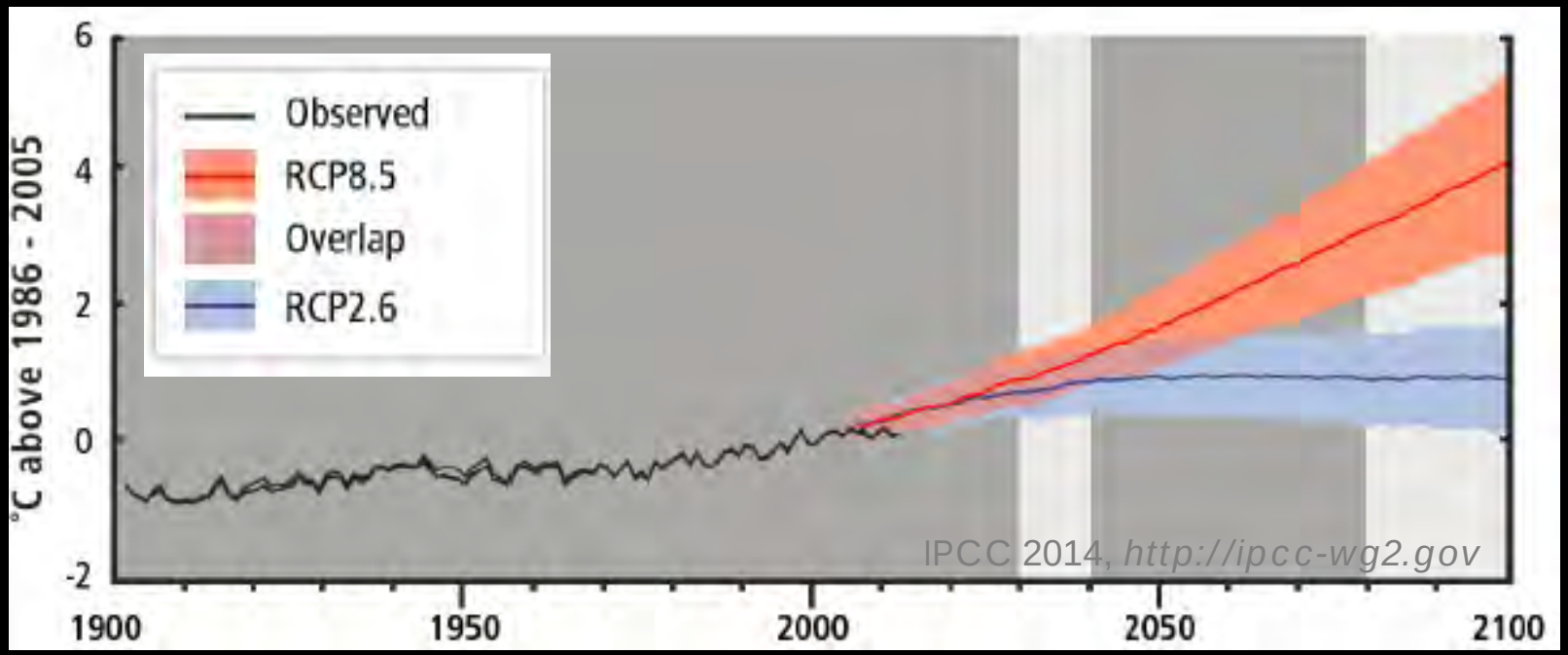
Temperature



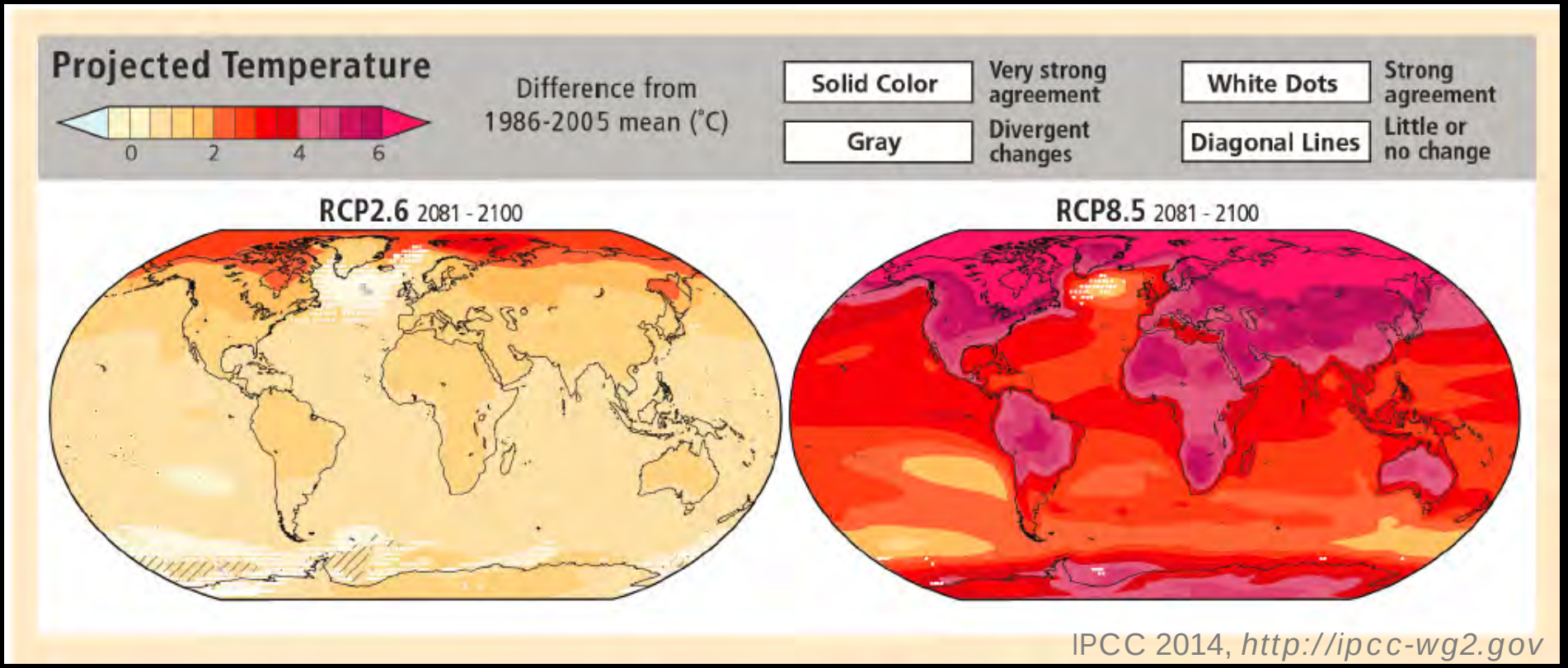
IPCC 2014, *http://ipcc-wg2.gov*

- Longer frost free season
- More frequent night-time heat wave events
- Declining spring snowpack

Future Projections



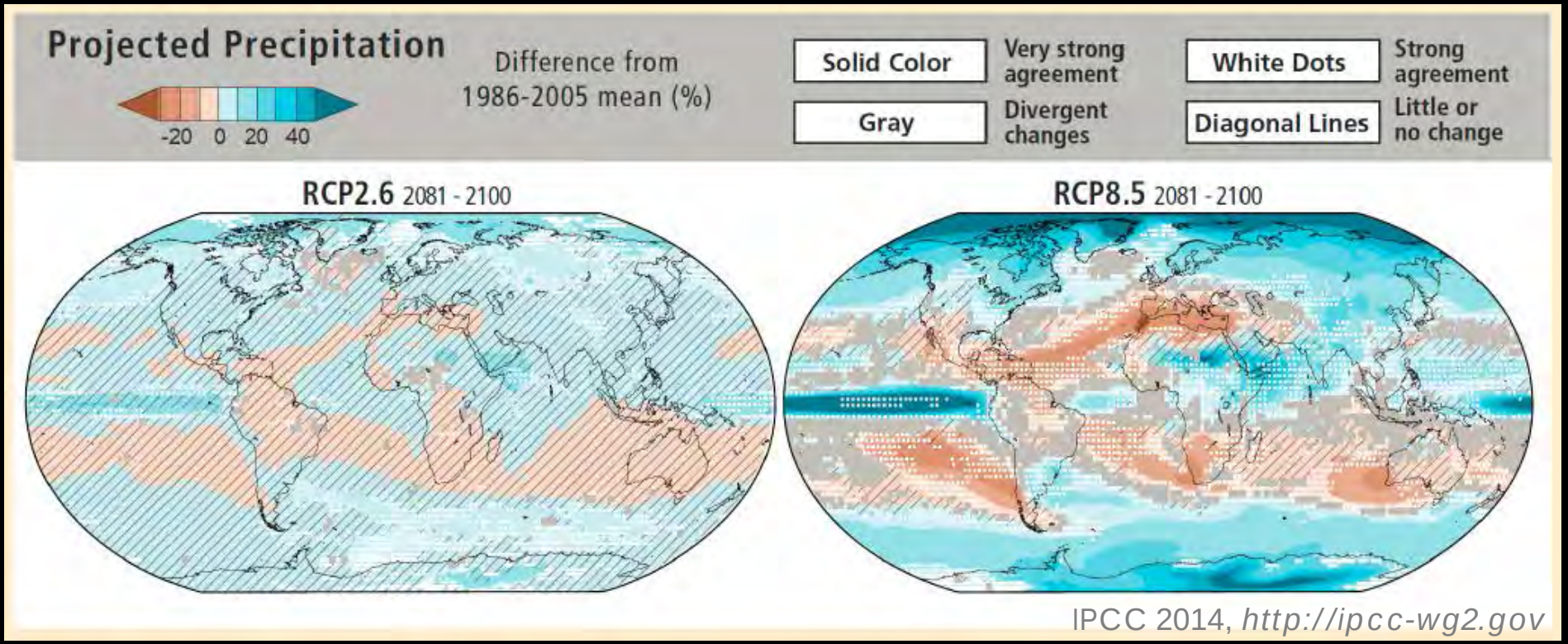
Future Temperature



IPCC 2014, *http://ipcc-wg2.gov*

- ~3°C (6°F) increase in PNW by 2050
- More extreme heat events
- Continued loss of snowpack

Future Precipitation



IPCC 2014, *http://ipcc-wg2.gov*

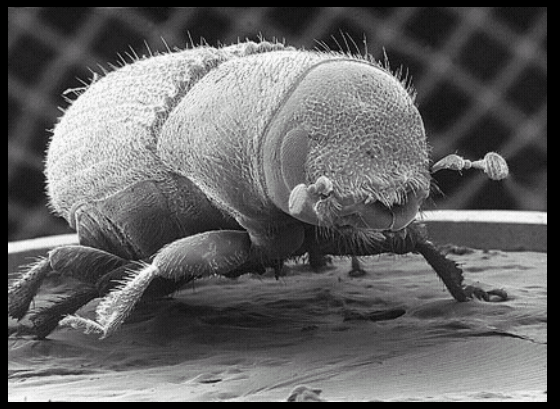
- Drier summers in PNW
- Wetter winter, spring, and fall
- Increase heavy rainfall events


Establishment
Growth
Distribution
Disturbances

Direct effects

- Warmer temperatures - increase productivity?
- Drier summers and wetter winter, spring, fall
- Increased CO_2

Indirect effects



- Fire – area burned is projected to increase
- Disease – dwarf mistletoe, *Armillaria*, alder canker, swiss needle cast increase
- Insects – increase then decrease in mt. pine beetle
- Decrease in productivity, carbon sequestration?
- Others effects?

Assess Vulnerability

- Sensitivity
- Exposure
- Adaptive capacity

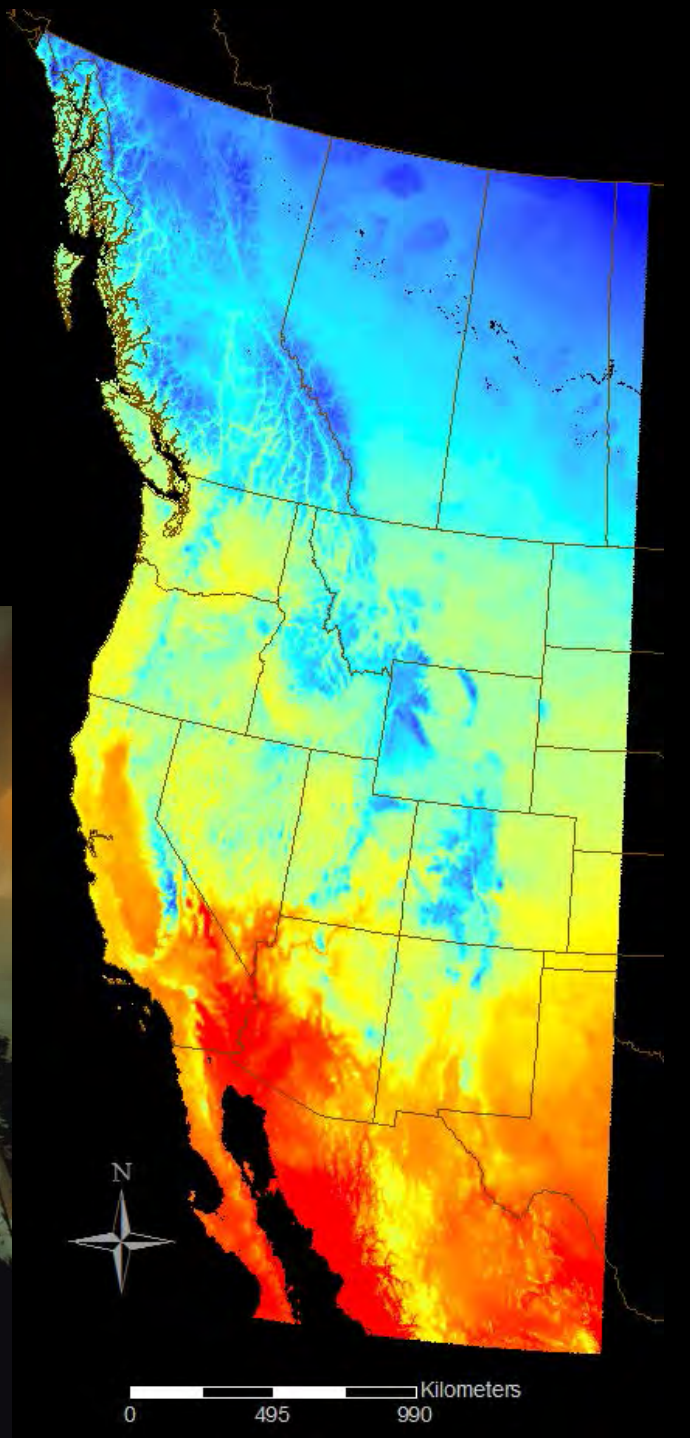
Why?

- Priority setting
- Developing adaptation strategies

Sensitivity

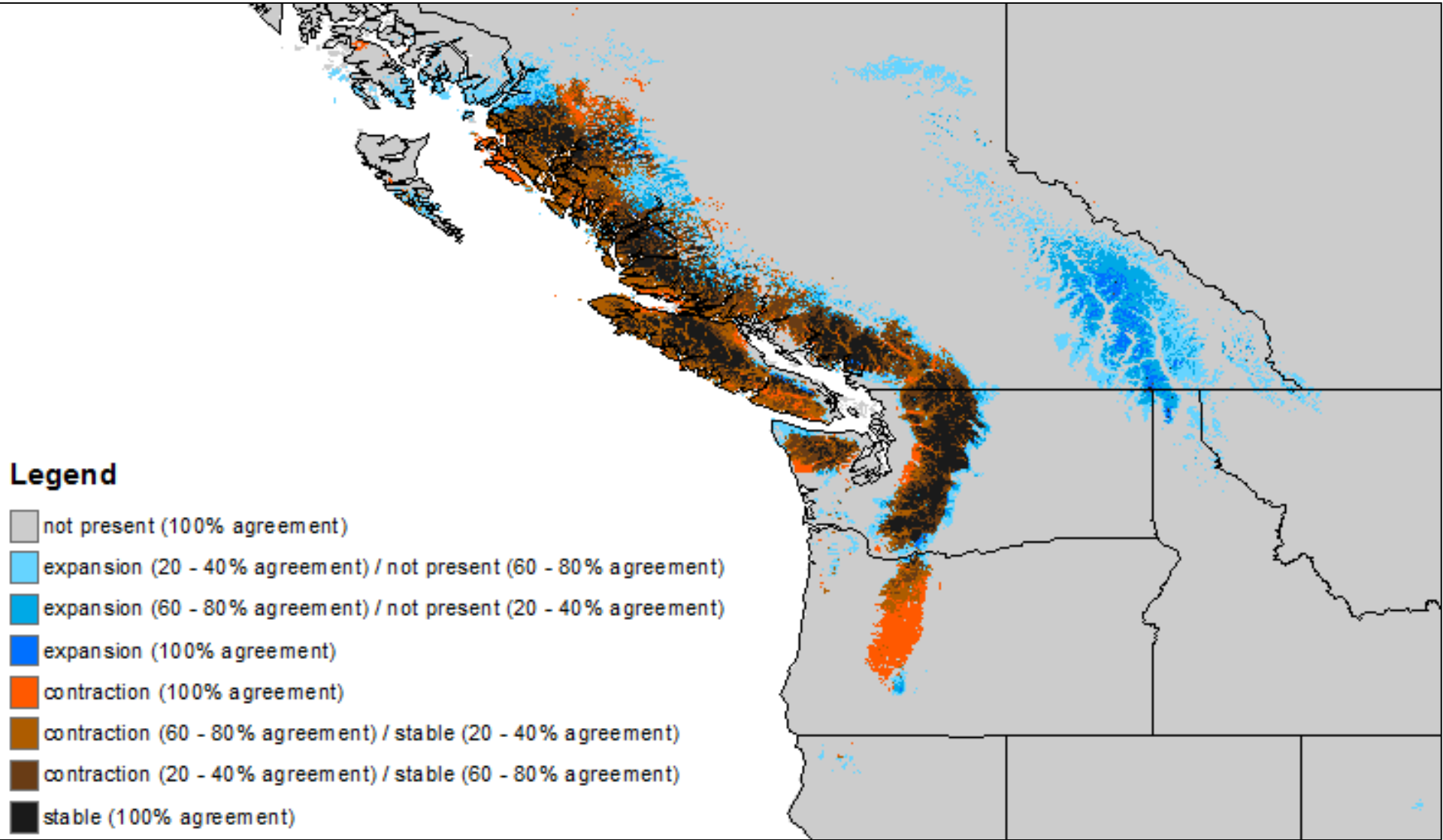
- Physiological factors
- Dispersal abilities
- Reproductive abilities
- Interspecific dependencies
- Disturbance regimes
- Interacting non-climatic stressors

Exposure



Adaptive Capacity

Future projections for Pacific silver fir (ensemble for 5 GCMs)



Remove other threats

Restore habitat

Restore natural disturbance regimes

Promote evolutionary potential

Assisted migration

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