Considering the influence of climate change in managing mixed conifer forests

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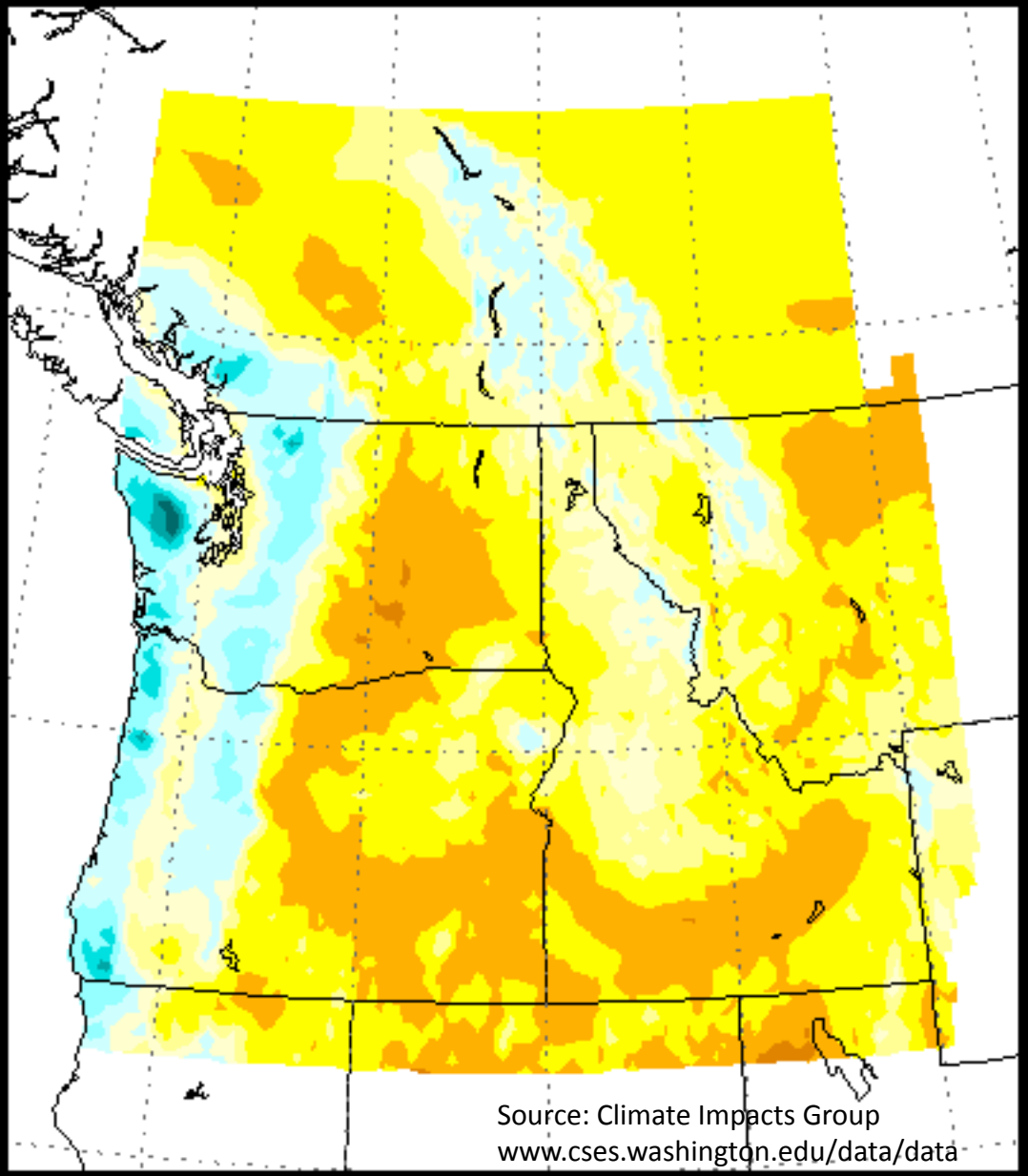
Expected Climate Change Impacts

- Warmer Temperatures
- Reduced precipitation and/or snowpack

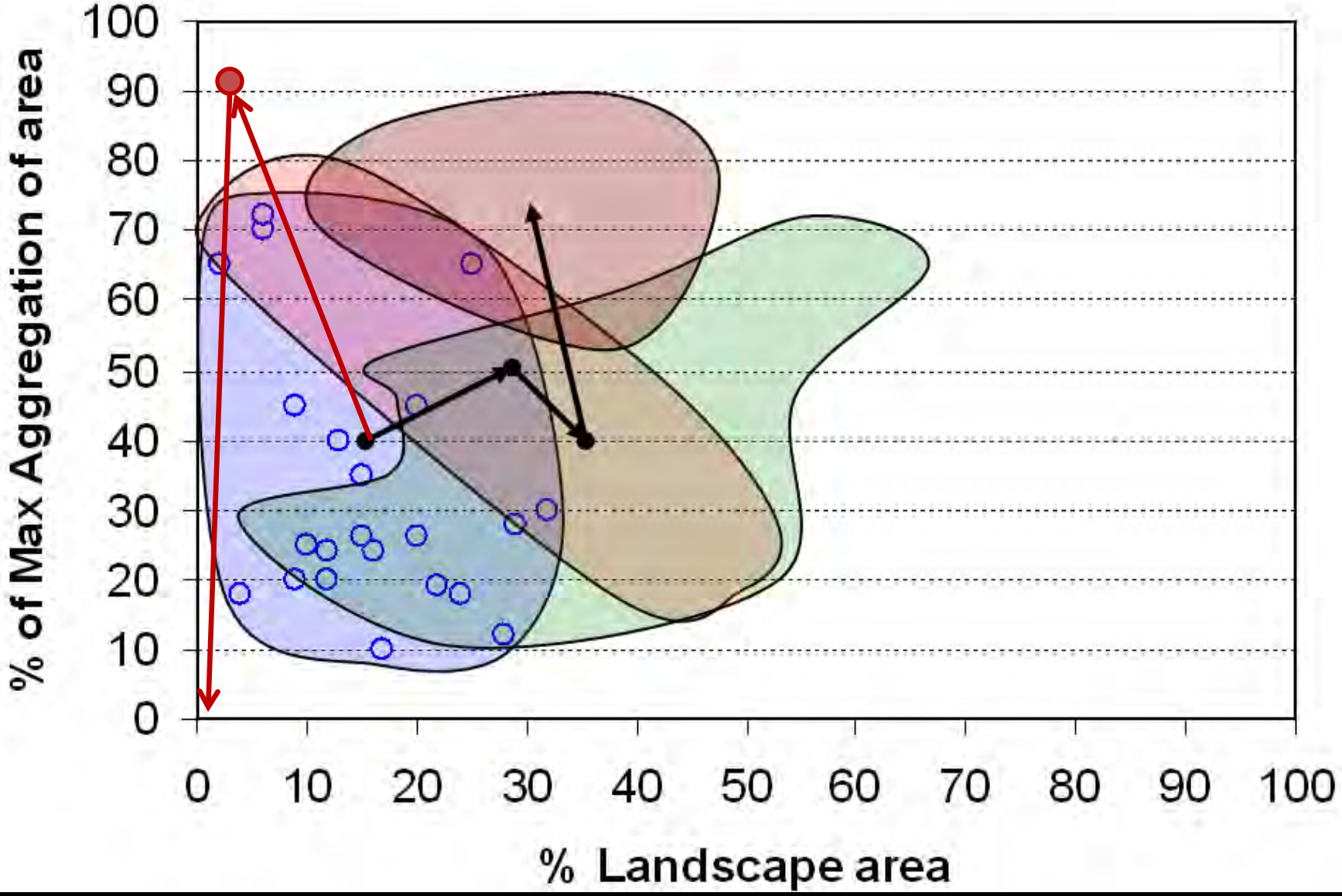
Expectations:

- ❖ Changes in physiology and ecology of organisms due to increased temperatures and moisture deficit
- ❖ Potential for increased vulnerability to insect and disease
- ❖ Increase in severity and frequency of wildfire season
- ❖ Elevation and latitudinal shifts in distributions

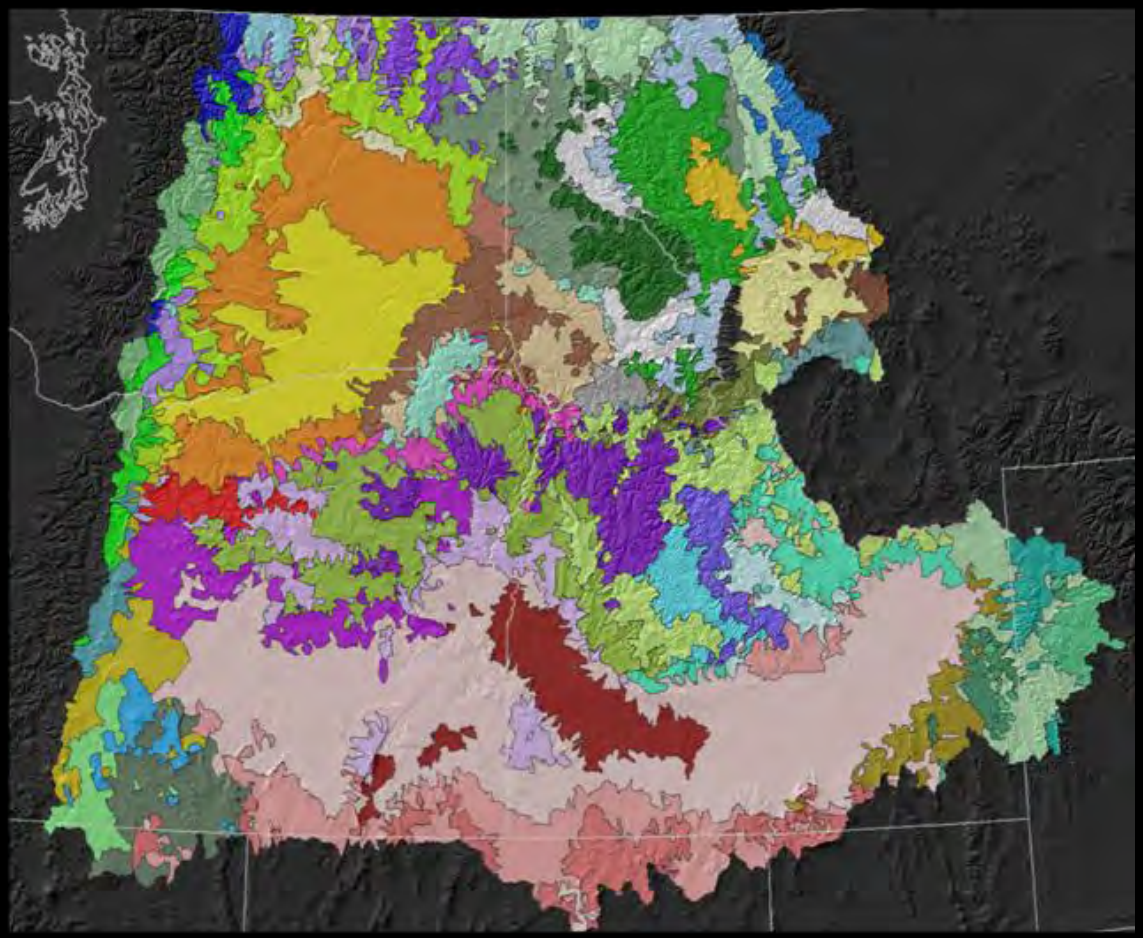


Source: Climate Impacts Group
www.cses.washington.edu/data/data

Area and aggregation of forest structure



Ecological subregions of the Interior Columbia Basin



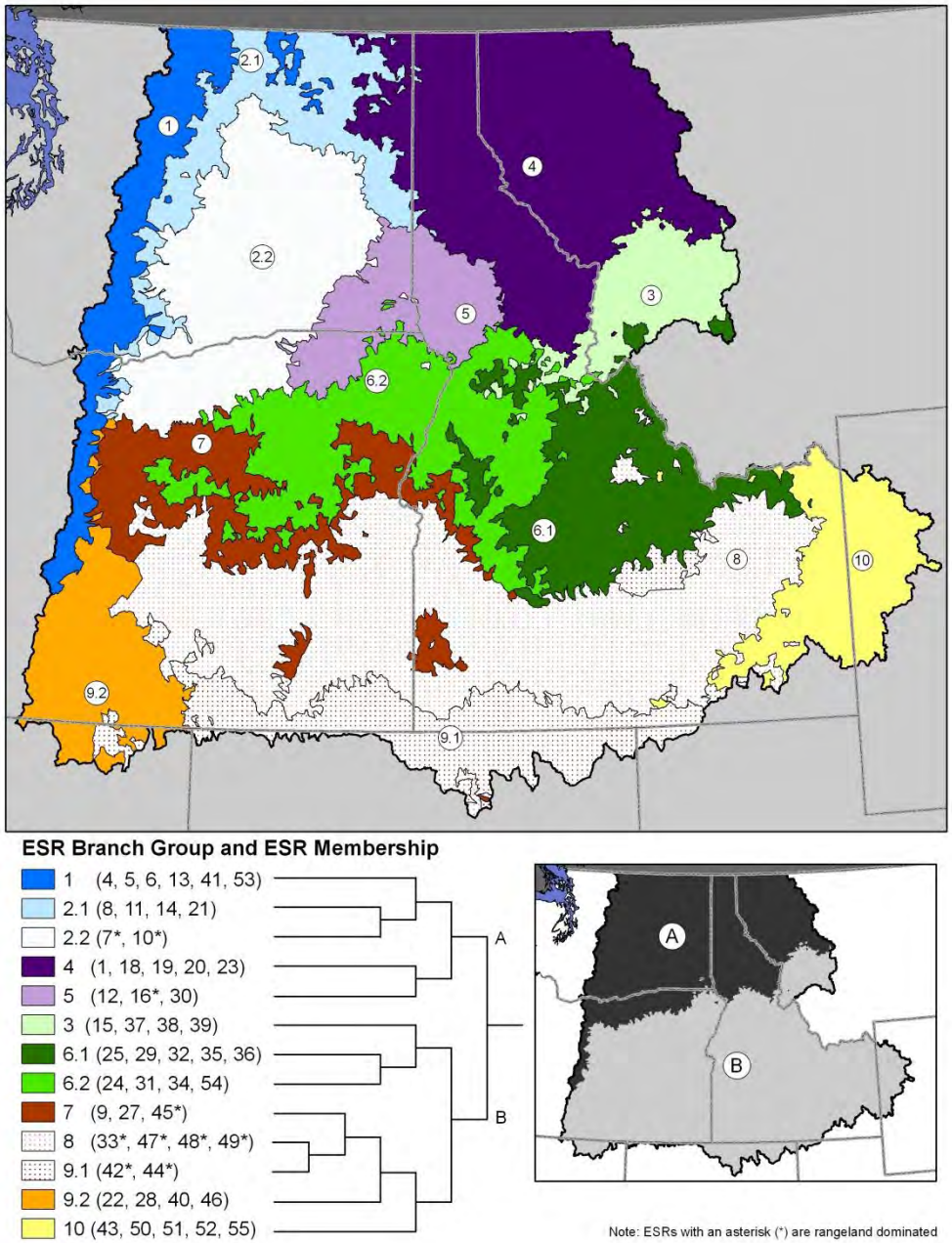
54 ESRs

Interior Columbia Basin Ecosystem Management Project (ICBEMP)

Hessburg et al. 2000

Based on:

- Temperature
- Precipitation
- Solar insolation
- PVG
- Bailey's Eco's.



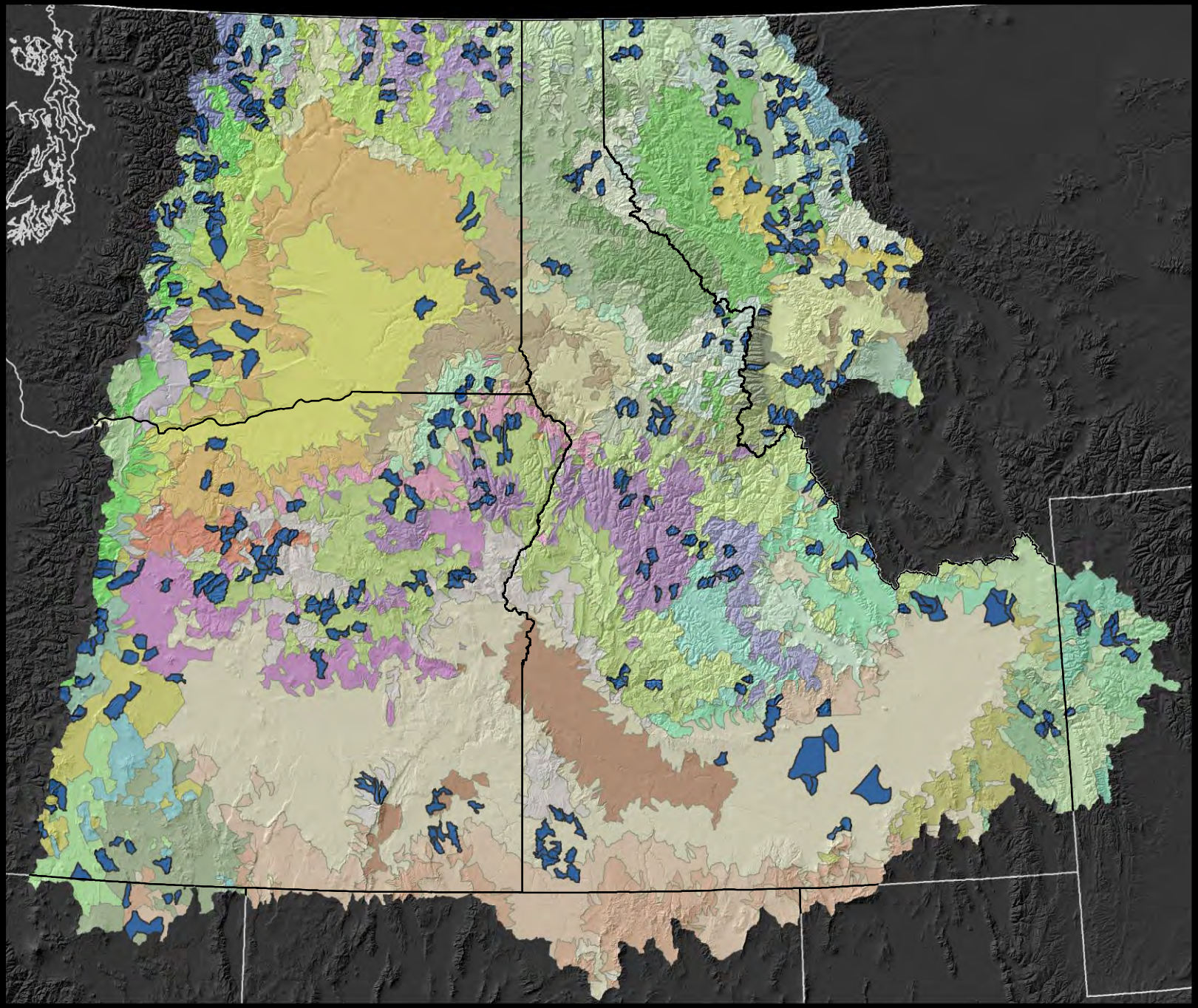
- Temperature
- Precipitation

Landscape metrics are computed for an attribute (e.g. Structure) for the entire mosaic.

Richness (PR)
Diversity (SHDI, N1, N2)
Evenness (MSiEI, Alatalo's)
Arrangement (Contag., IJI)

Class metrics measure the aggregate properties of the patches belonging to a single class or patch type.

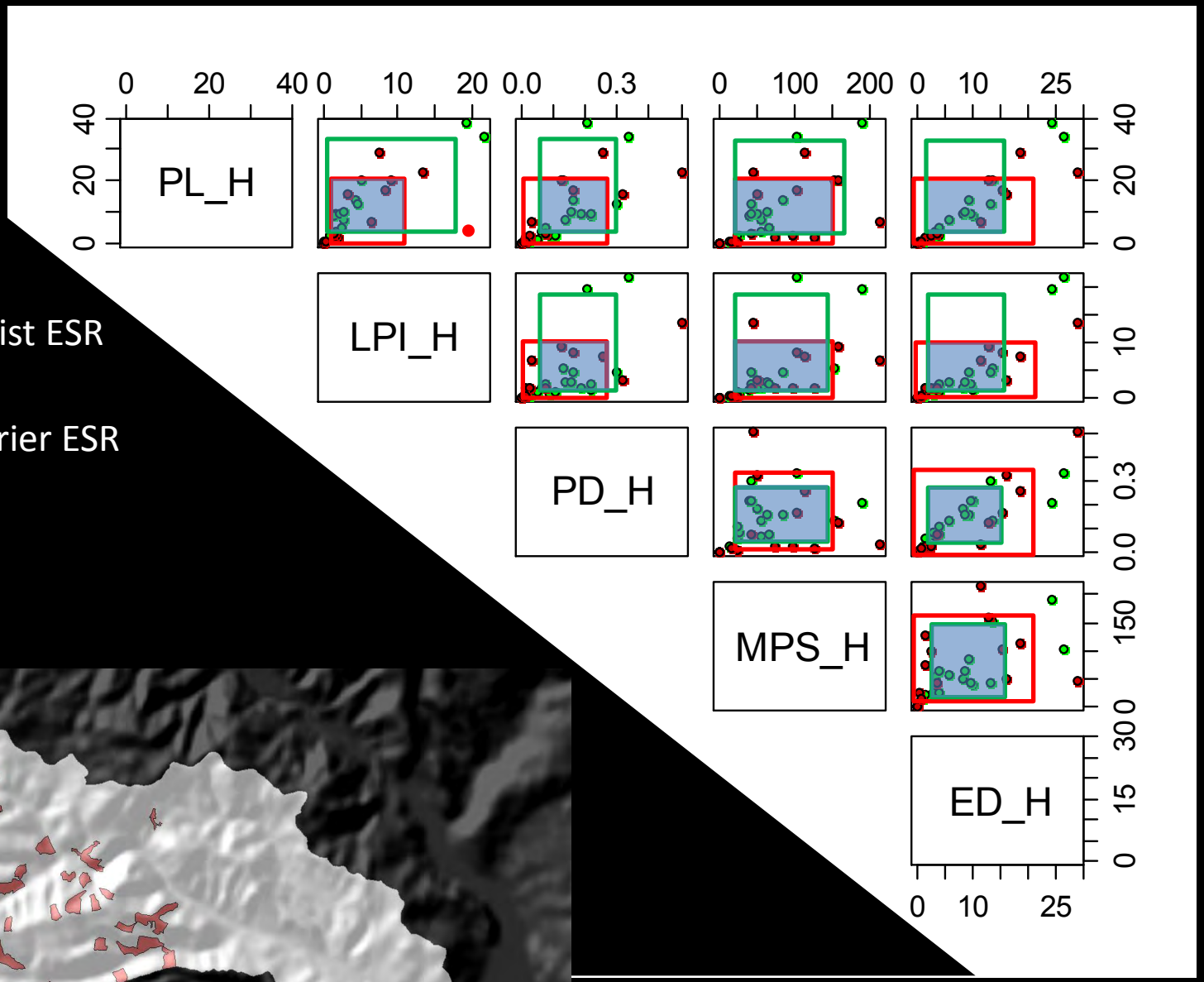
Percent Land
Largest Patch index
Patch Density
Mean Patch size
Mean nearest neighbor
Edge Density
Aggregation Index

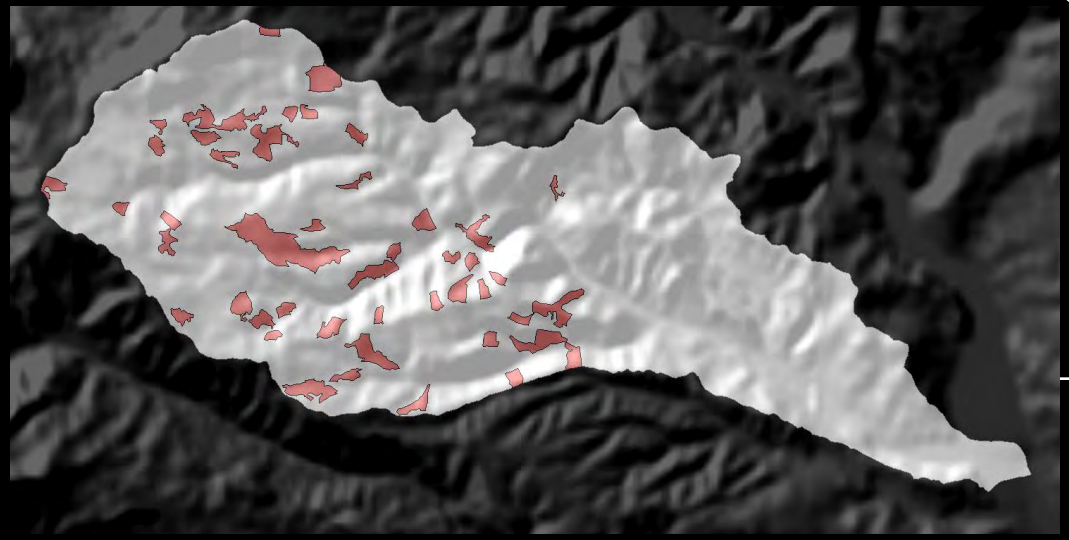


Cooler/moist ESR

Warmer/drier ESR

Class Metrics



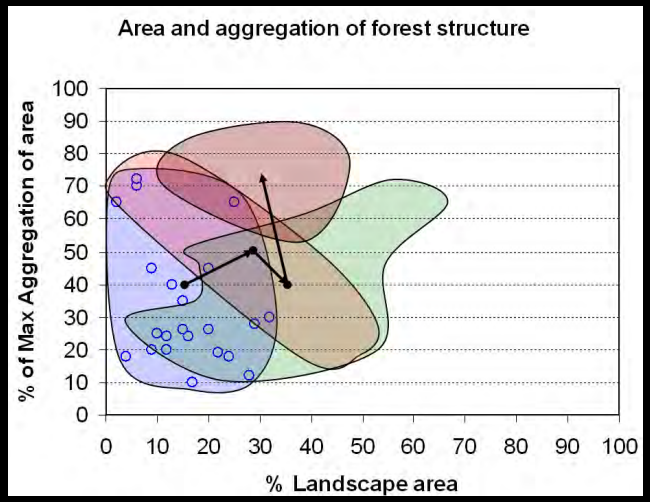


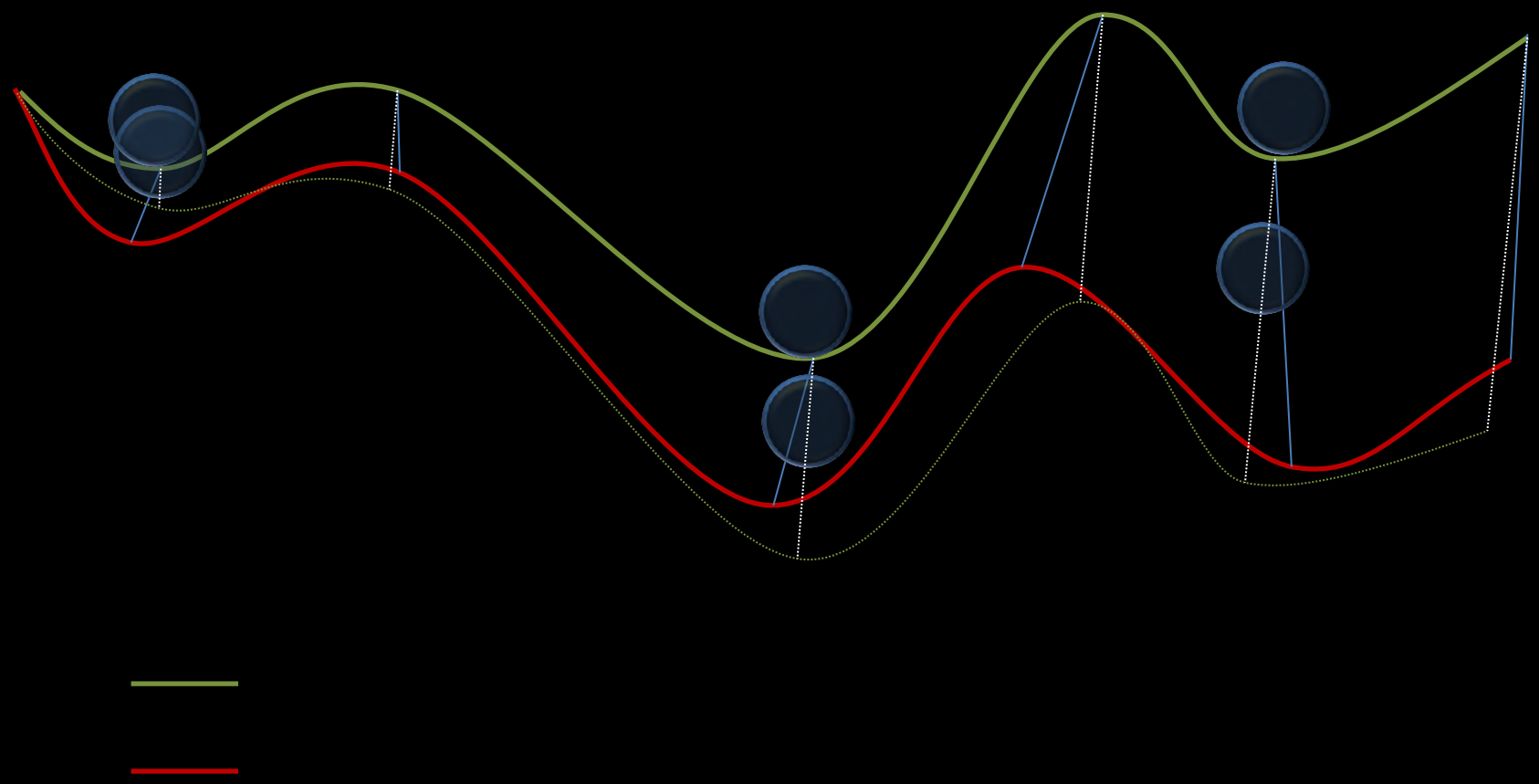
Key Points:

- Climate Change will have a regional impact
- Predictions are not at a scale to indicate where, how, or if organisms will adapt
- Ecosystem effects will lag behind climate <u>but</u> interactions with disturbance will dictate rate of change
- Managers should expect <u>*some*</u> existing resilience to climate change given time
- Maintaining a Mixed Conifer component on the landscape will likely require nuanced management of the vegetation patterns and compositions that drive disturbance… both within and outside of MC.

Concluding Remarks:

- There are no correct answers
- Management should look to nudge ecosystem patterns and compositions to influence process
- OWNF climate change approach is an attempt maintain our current organisms and buy them critical time to adapt



Questions & Comments

Climate Change