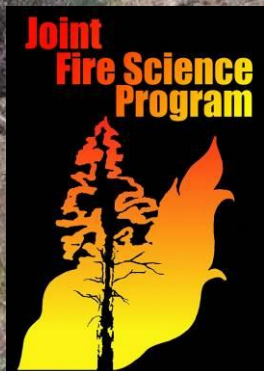


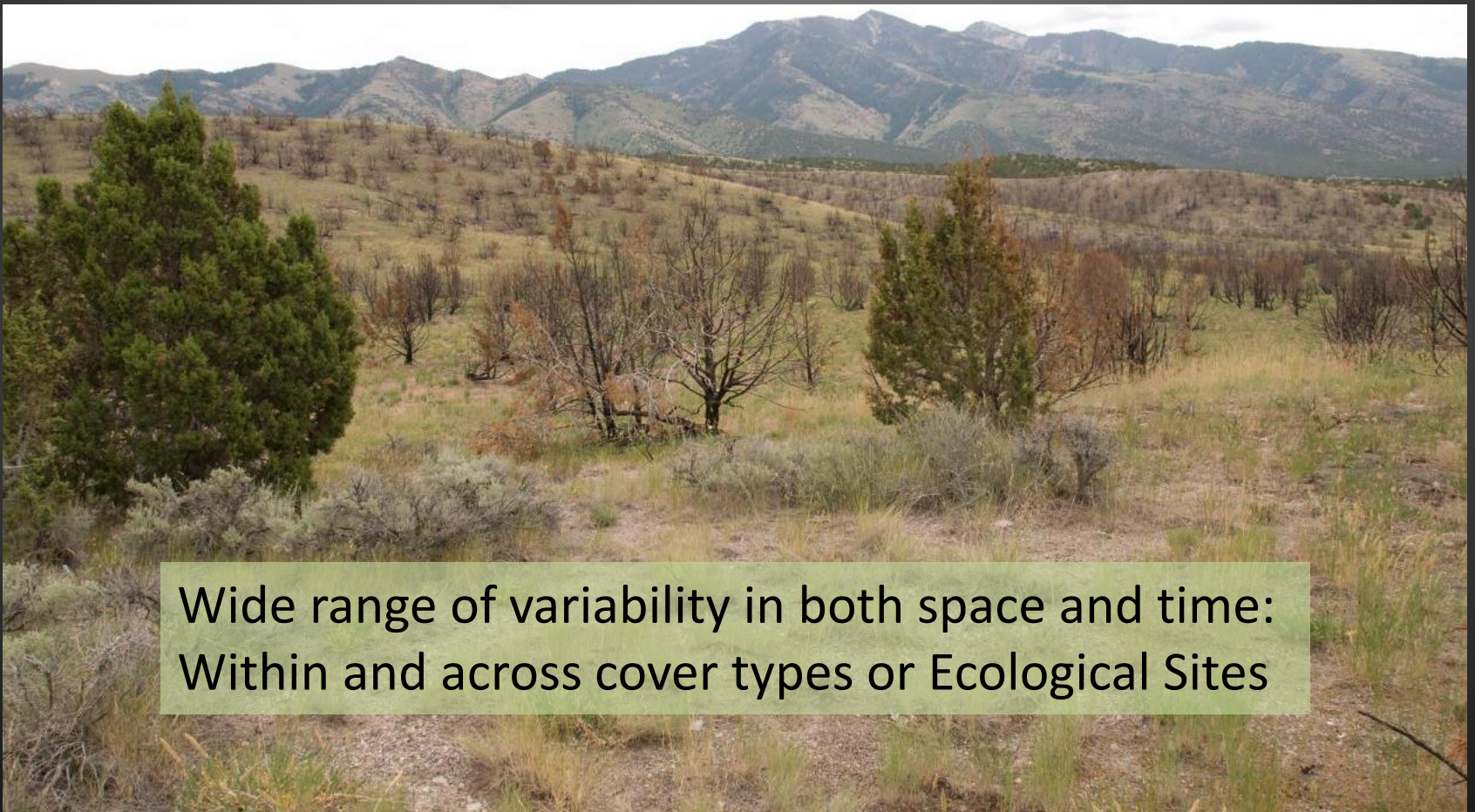
Fire Effects on Great Basin Vegetation: The Role of Ecological Site Attributes

Rick Miller
Oregon State University, EOARC



Fire Regimes & Characteristics

function of ecological site characteristics



Wide range of variability in both space and time:
Within and across cover types or Ecological Sites



Natural Process

Altered Process

Fire Today

Exotic Species

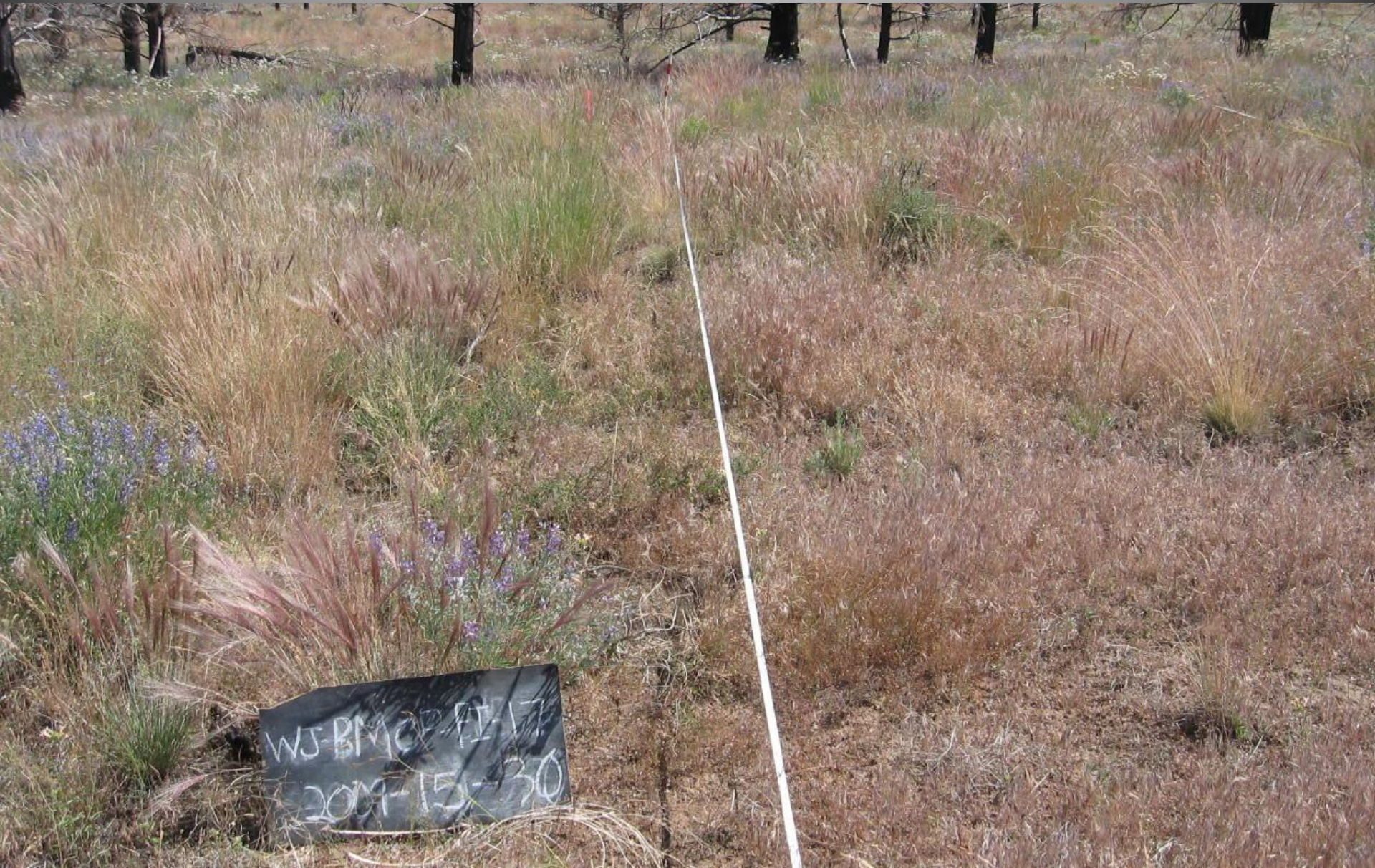
Restoration Tool

Restore
Degrade
Phase-at-risk
Trigger – New Steady State
Create & Destroy Habitats



Major challenge

Predicting post-disturbance succession?



A large wildfire is shown with a massive plume of dark, billowing smoke rising into a clear blue sky. The smoke is thick and dark, with some lighter, white smoke at the base where it meets the ground. The background features a range of mountains, some with sparse vegetation and others with denser green forests. In the foreground, there is a field of dry, yellowish grass and several green, coniferous trees.

Post-disturbance succession?

- Justify a prescribed fire
- Response following a wildfire
- Meeting the objectives
- Selecting the right site
& methods



WJ-BM-CP-FI-4
2009-5-0



WFL-0710
2004/12/10



WJ-DR-CP-FI-28
2009-15-0

Variability



WJFC-BVFI-27
2009-15-30



Heterogeneity

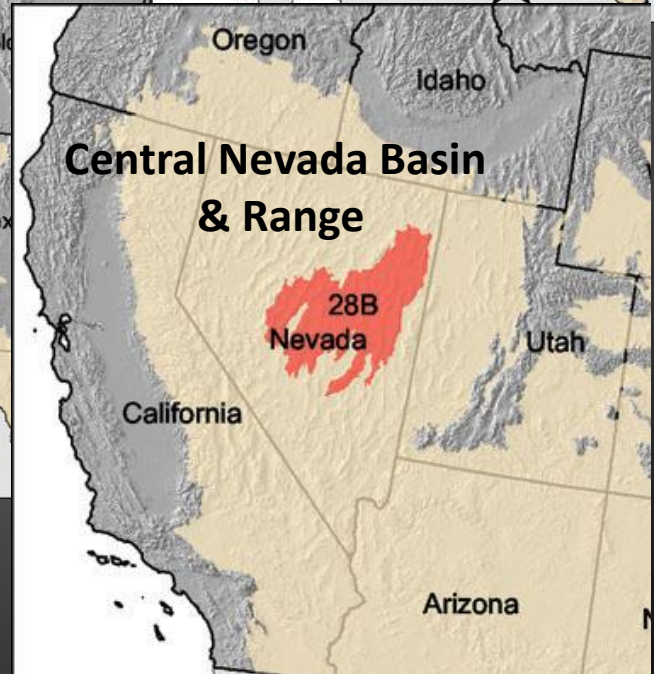
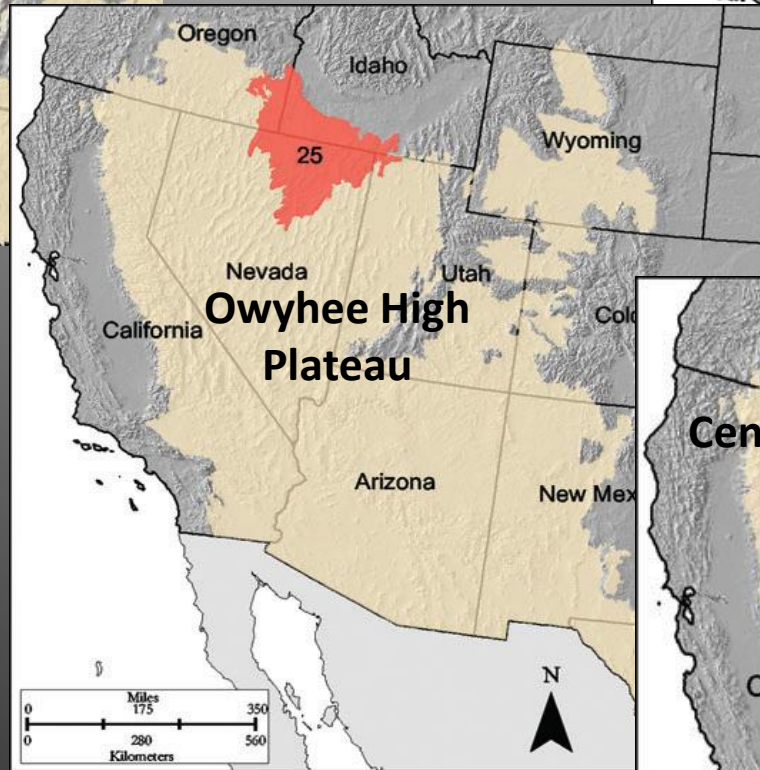
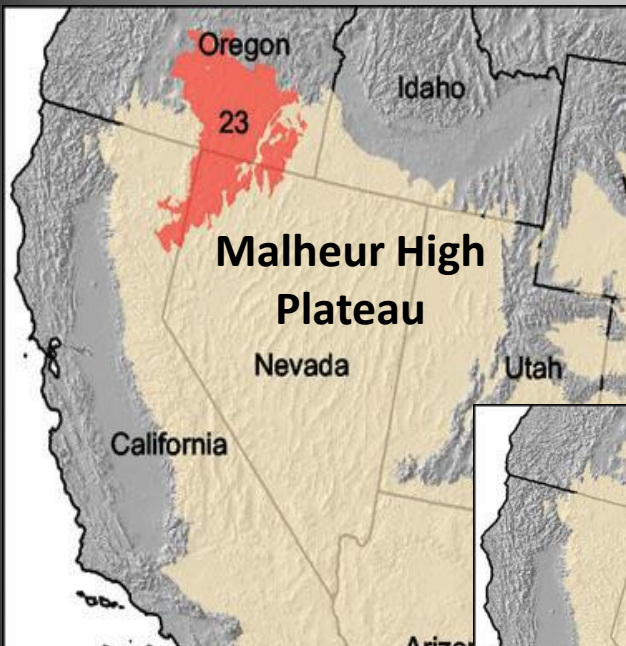
Environmental Gradients

Environmental gradients = predictable differences
occur at
multiple scales

WJFC-BVFI-27
2009-15-30

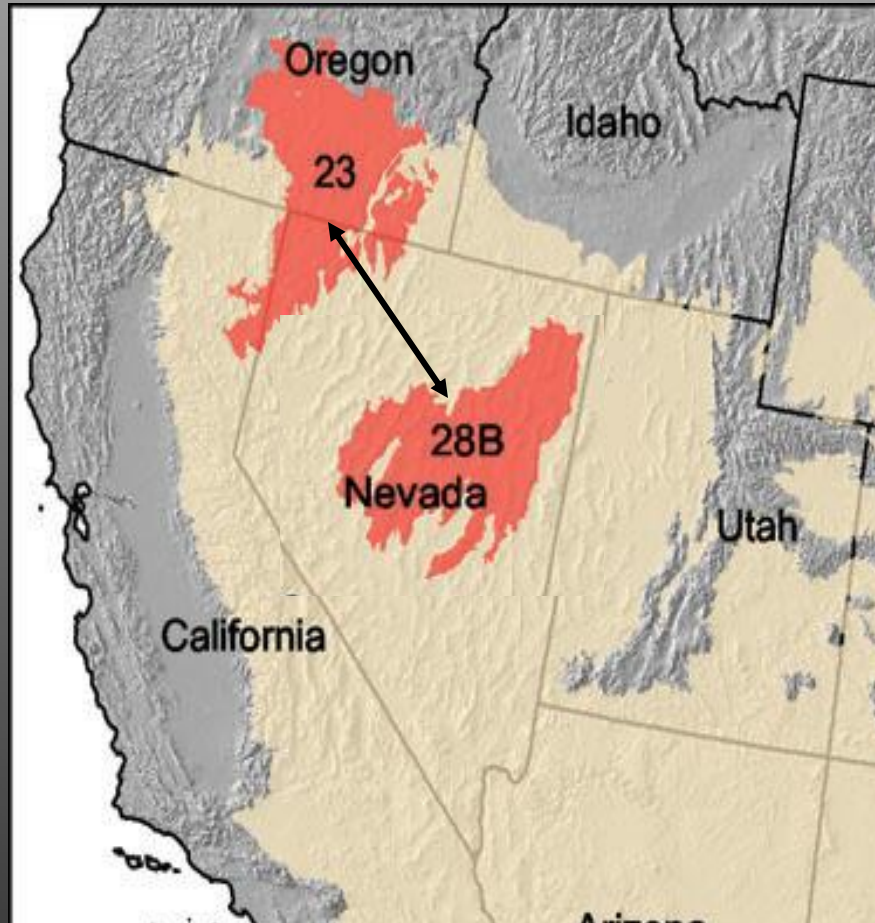


Regions (MLRA)



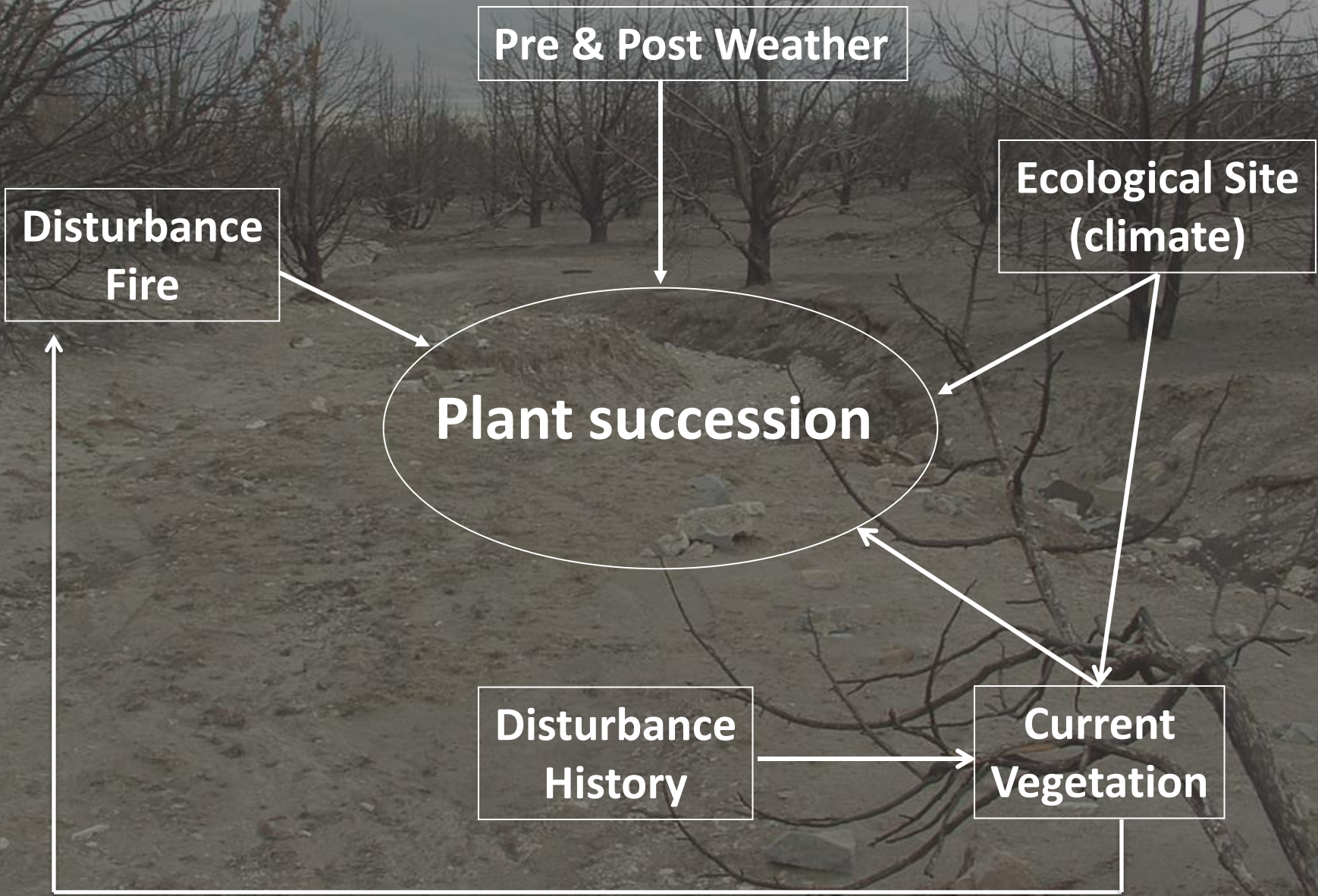
Western Range and Irrigated Region

Extrapolating results across different locations?



Malheur High
Plateau (23)

Central Nevada Basin
& Range (28B)



Disturbance
Fire

**Site Recovery
&
Resistance**

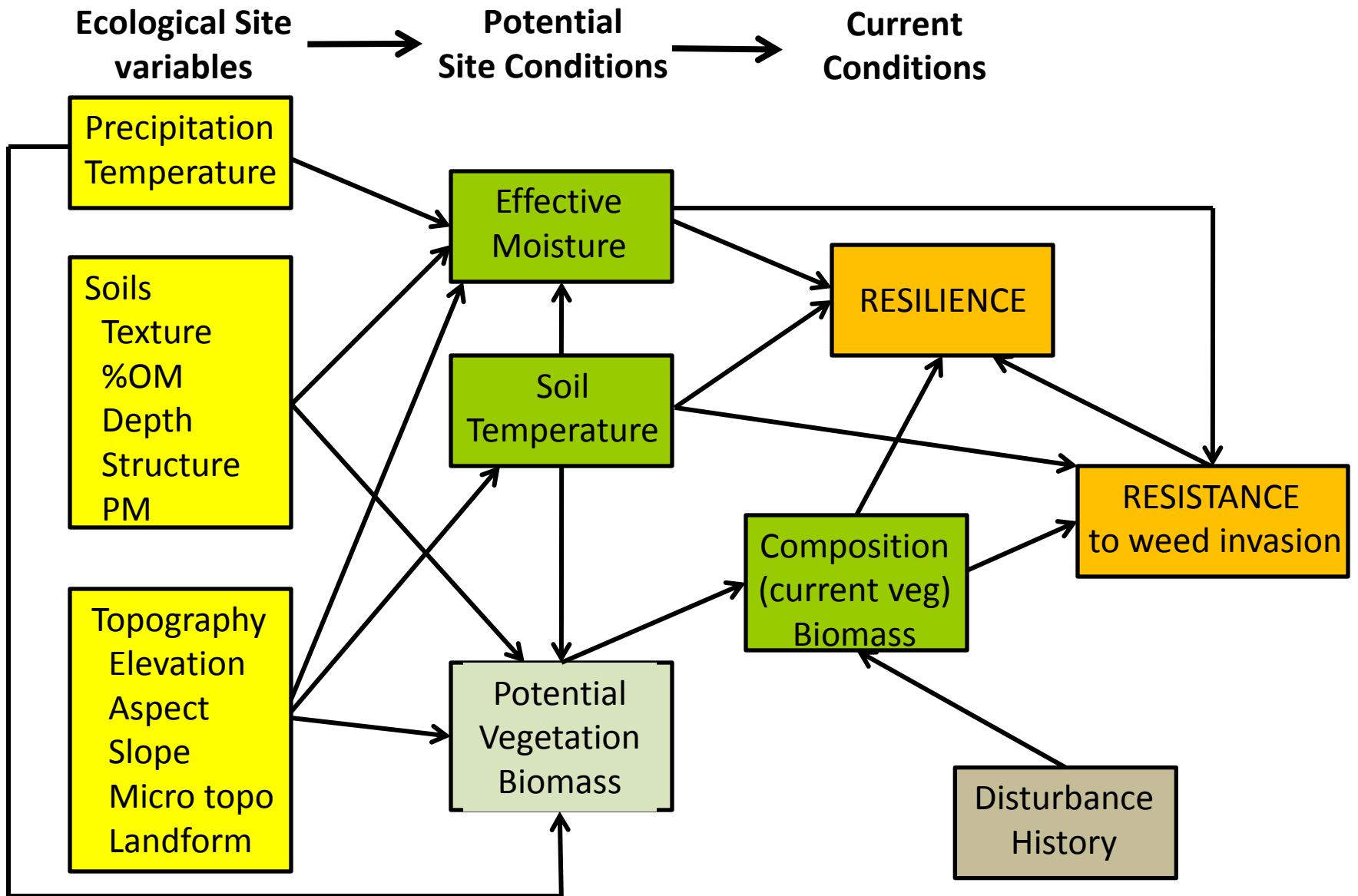
**Ecological Site
(climate)**

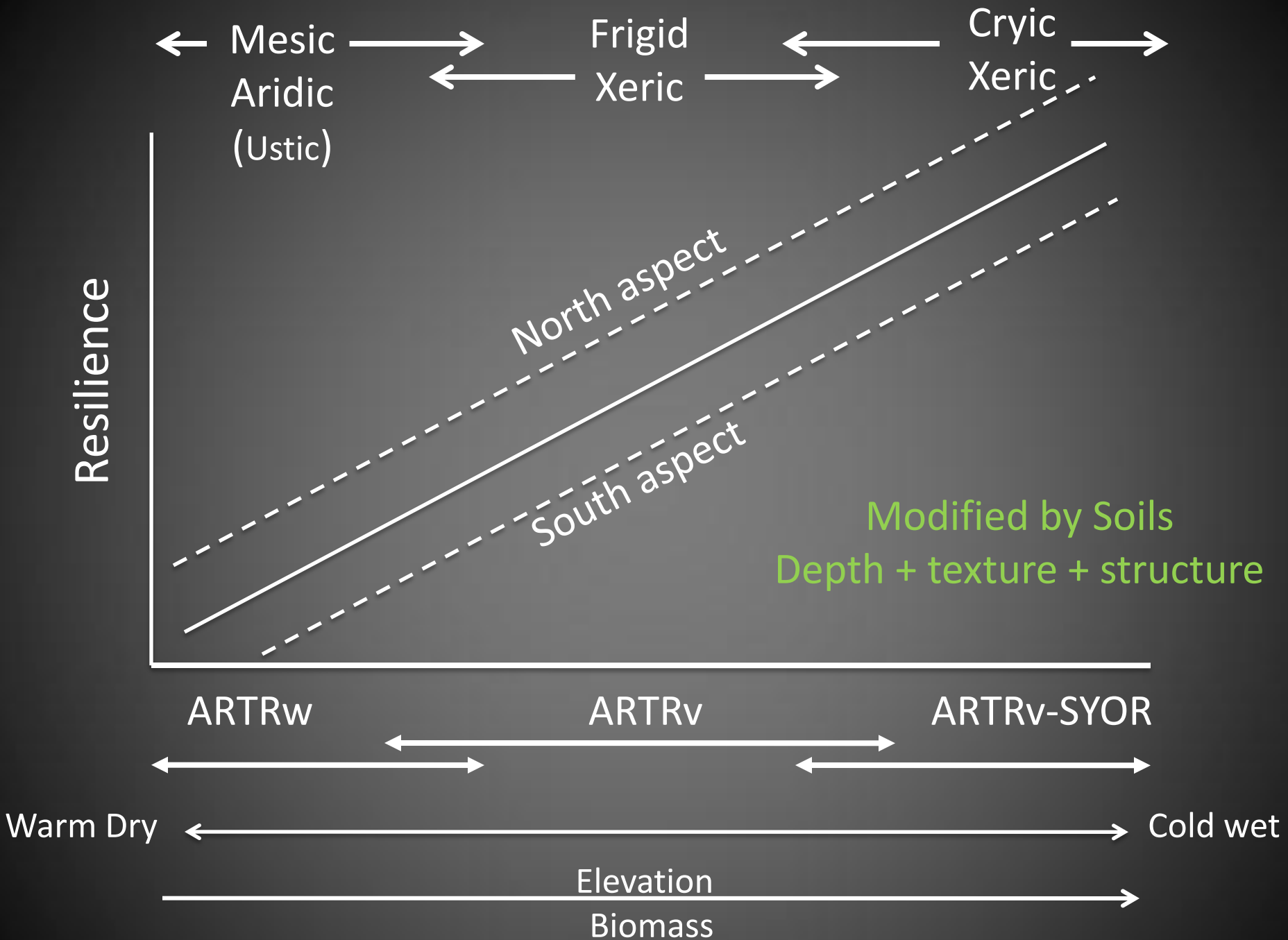
**Disturbance
History**

**Current
Vegetation**

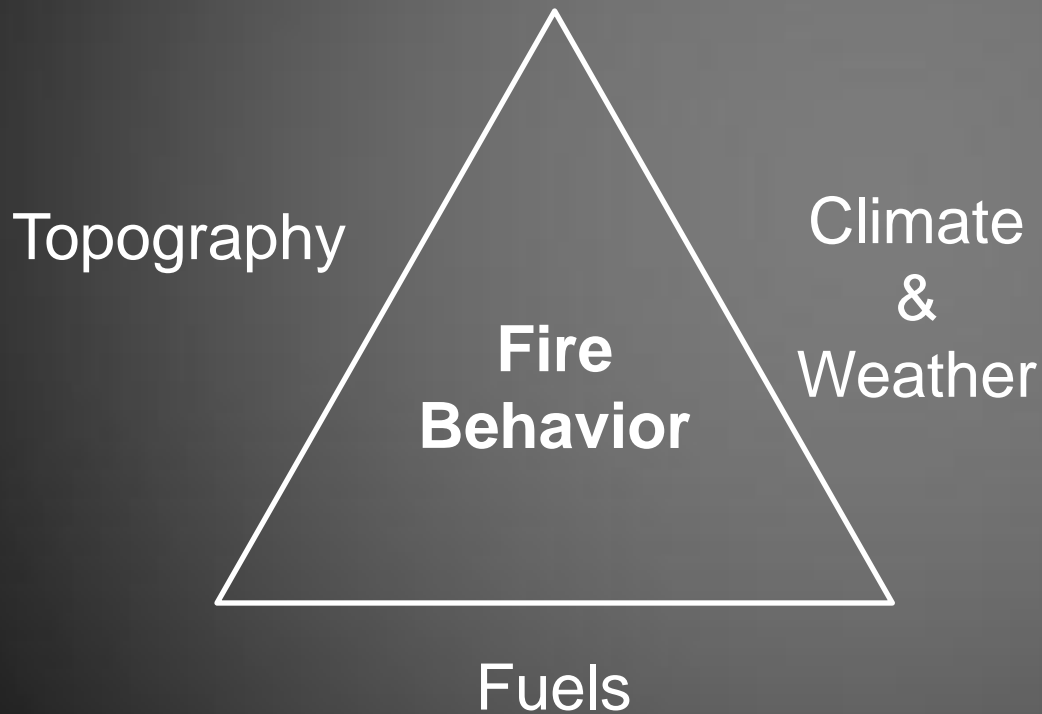


Drivers defined in an MLRA





Fire Severity
intensity, duration,
rate of spread,
crown, surface;
complexity, size, season



Topography

- Elevation
- Slope
- Aspect

Climate & Weather

- Precipitation
- Relative Humidity
- Wind
- Temperature

Fuels

- Abundance
- Moisture
- Structure
 - Continuity
 - Compaction
 - Size
 - Etc.

Ecological Site Attributes

Evaluating site recovery & resistance

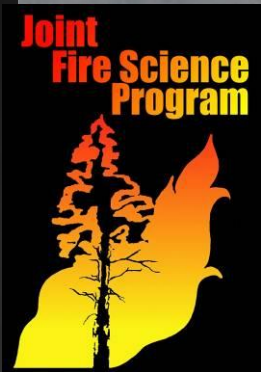
Selection of site & treatment

Justifying treatment

Extrapolating results across different locations

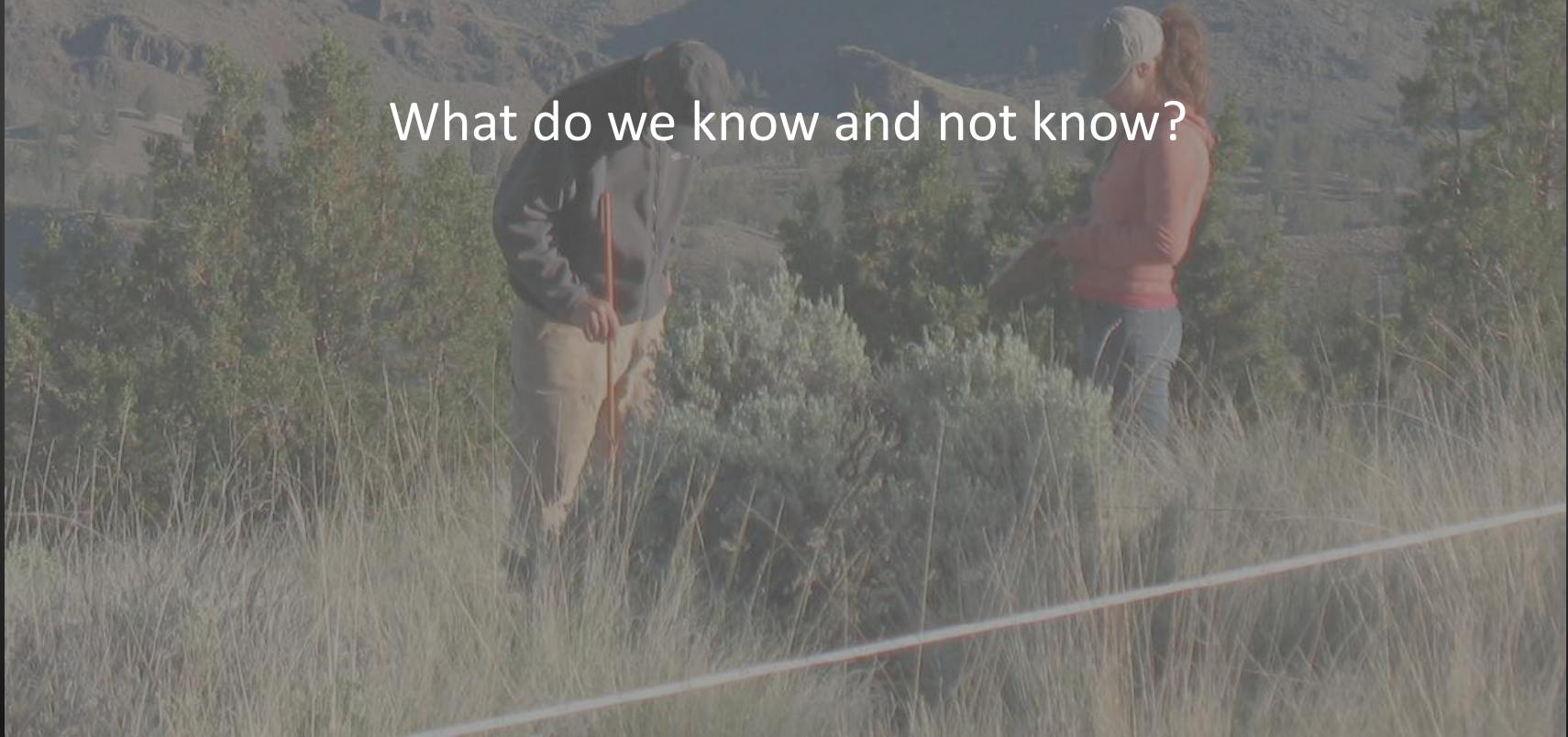
Sorting through the literature





Fire Synthesis on Impacts of Fire on Vegetation In the Great Basin:

What do we know and not know?



Study Area

Location (MLRA), elevation, PZ,
Composition = potential & current
Soil moisture/temperature regimes?



Deep Rooted Perennial Grasses

Declined in 12 of 14 studies in the first year



Recovery 2-3 years



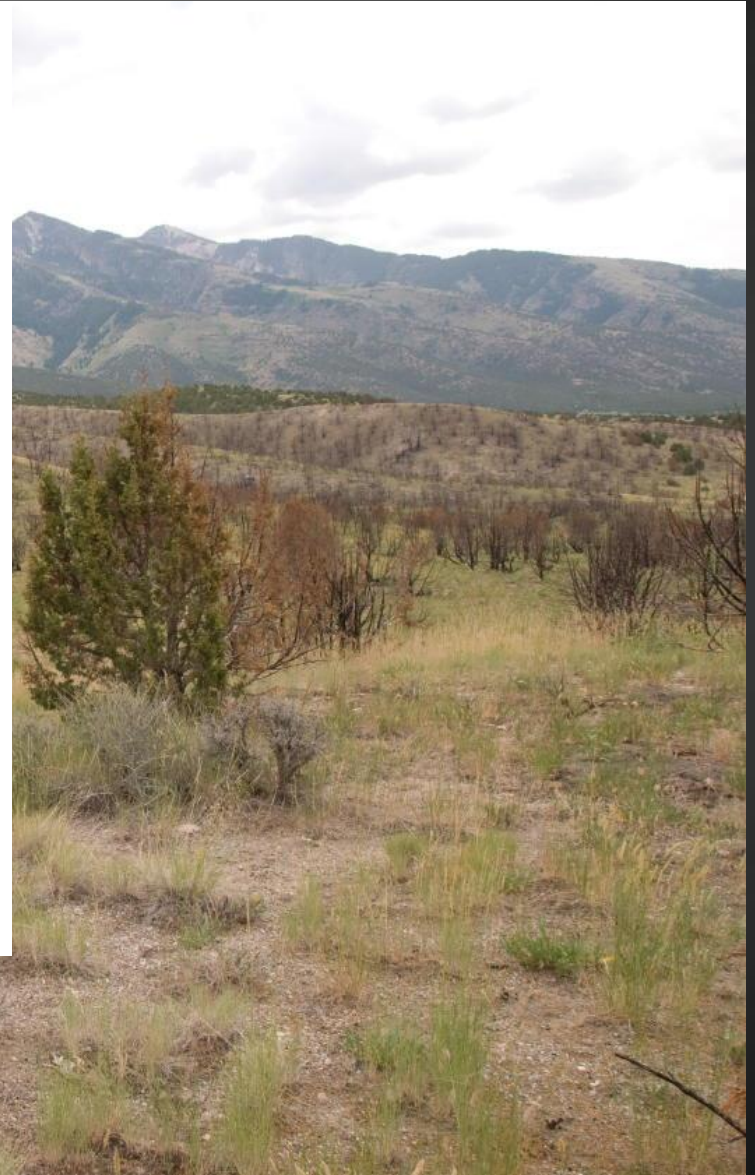
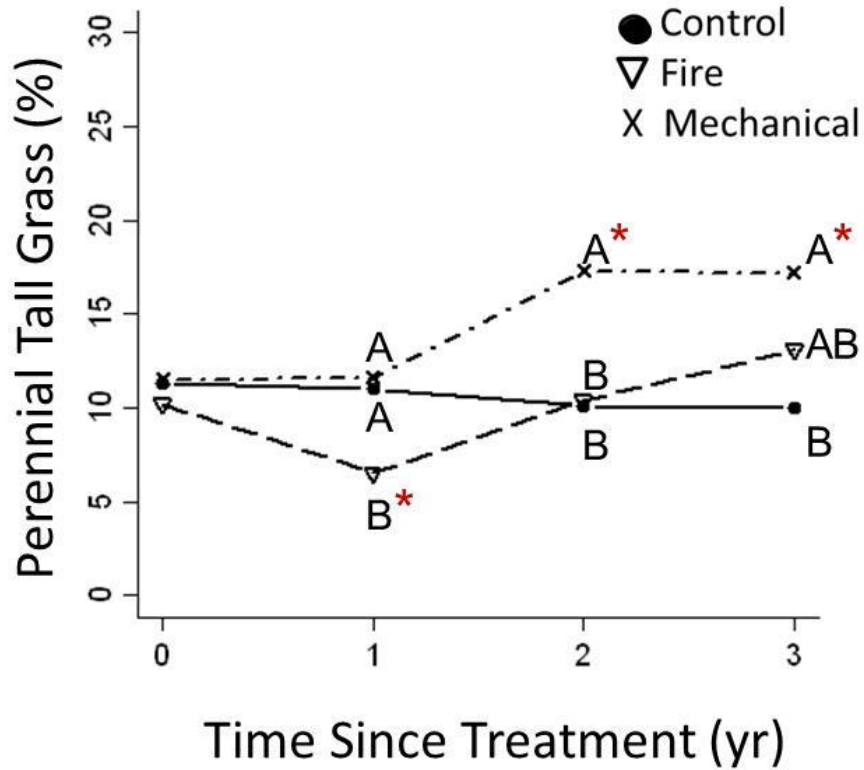
Year-2

WJ-BM-CP-FI-11
2009-15-0

Seed Pools versus Residual Vegetation? Perennial Grasses



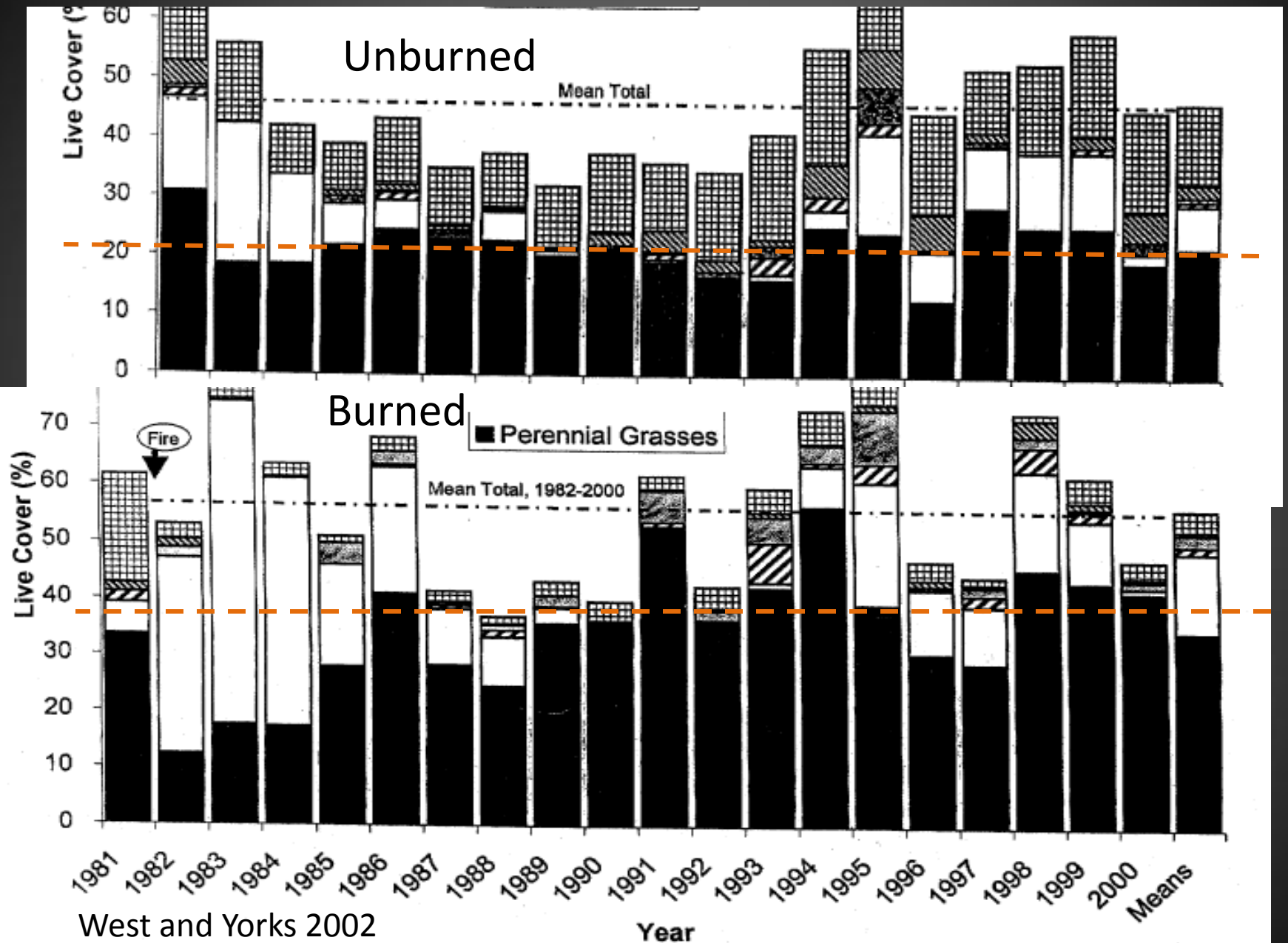
Long Term Response ?



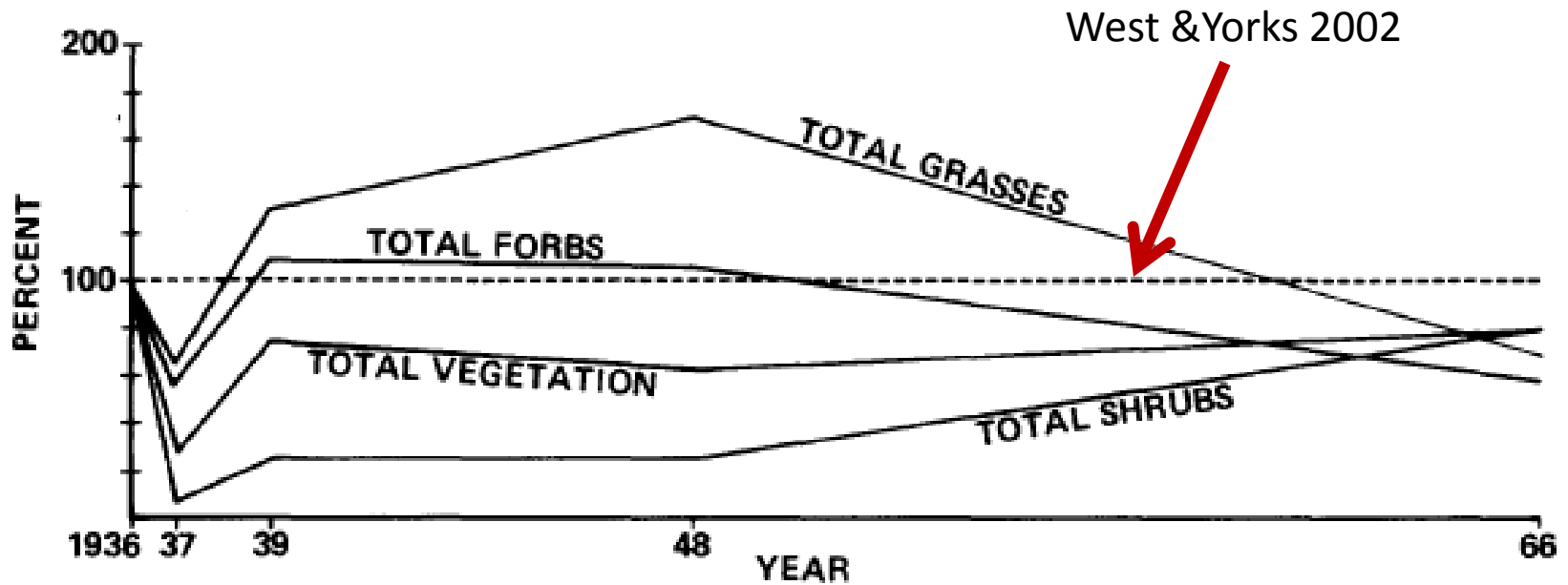
Long term comparisons?



Perennial Grasses (19 years post-fire)



30 years (1936-1966)
Mt Sage/Bluebunch-Idaho fescue



Perennial Forbs & Fire?



Mesic-aridic (10-12 PZ); Wyoming big sagebrush/bluebunch wheatgrass-Thurber

Perennial Forbs on cool moist site (frigid/xeric)?

70% reported an increase



Estimated 17 million acres with
>10% cover of introduced annual grasses

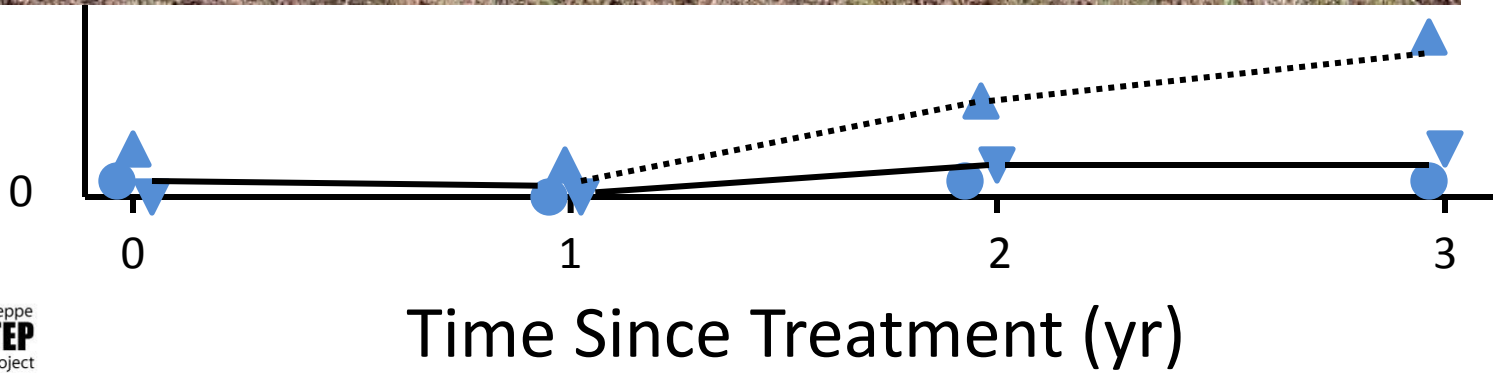


2009 Year-3

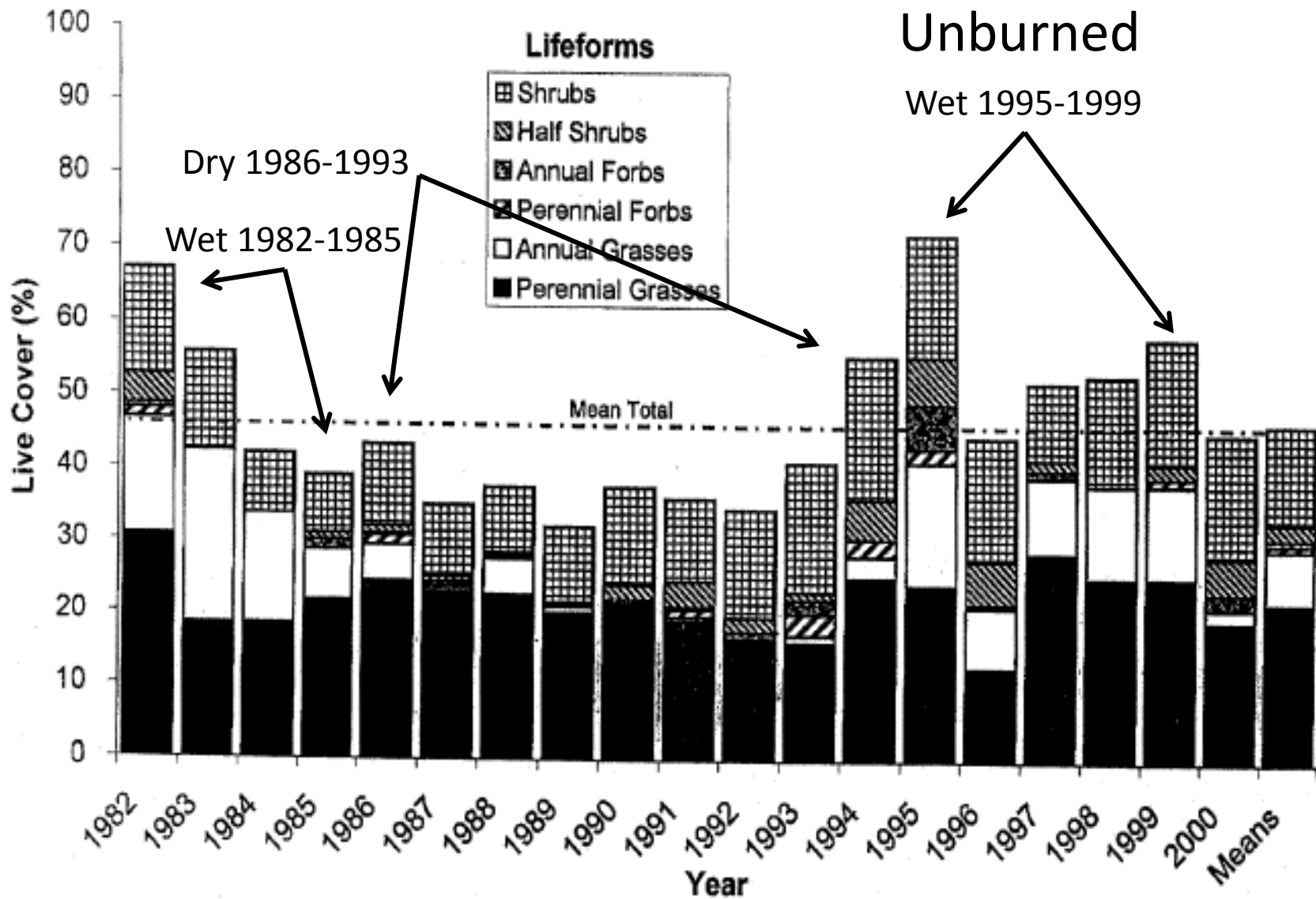


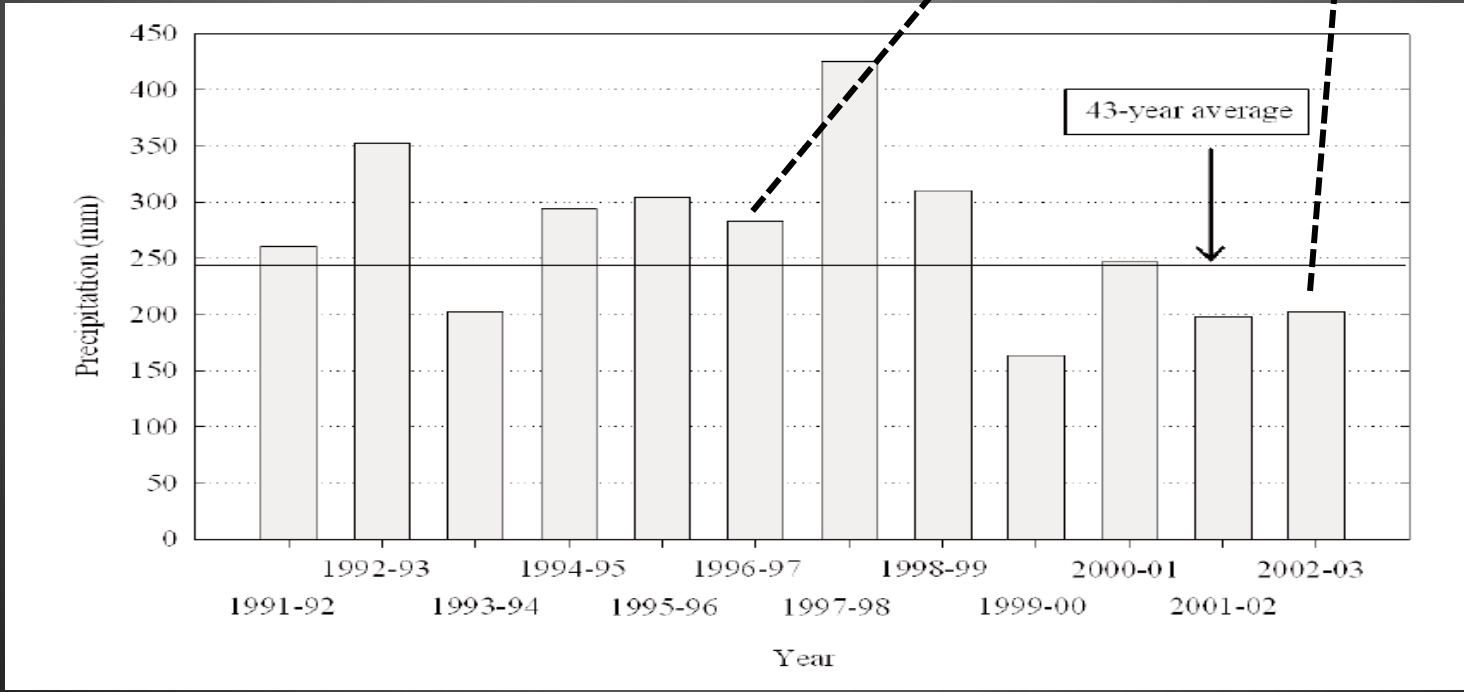
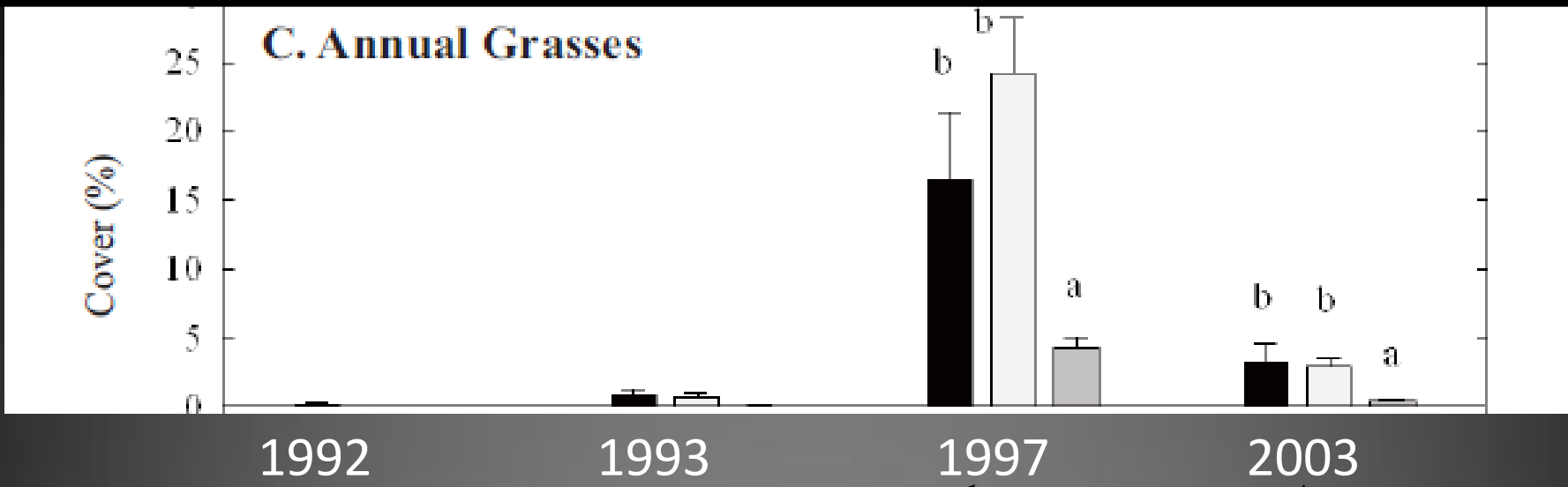


frigid



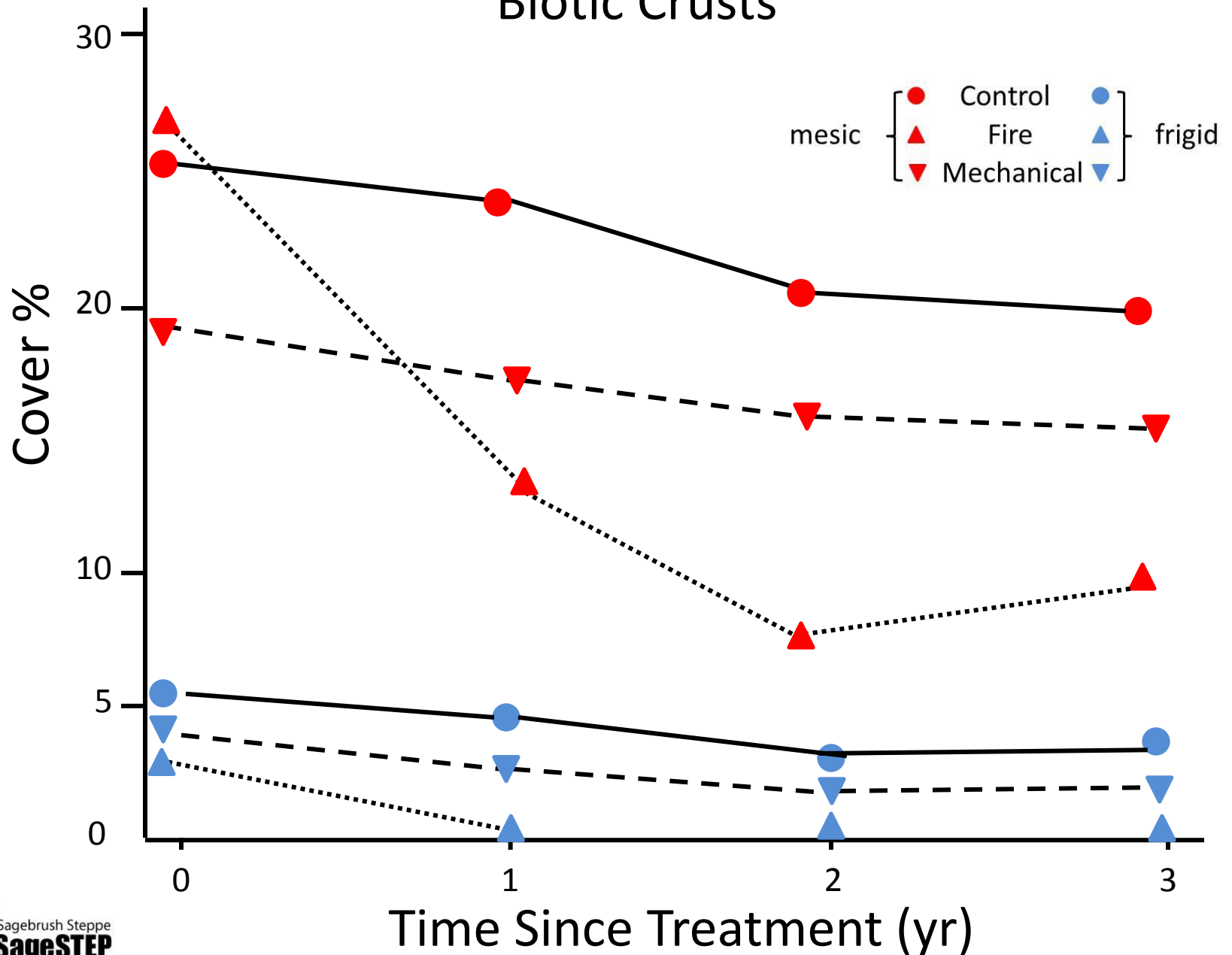
Cheatgrass Response



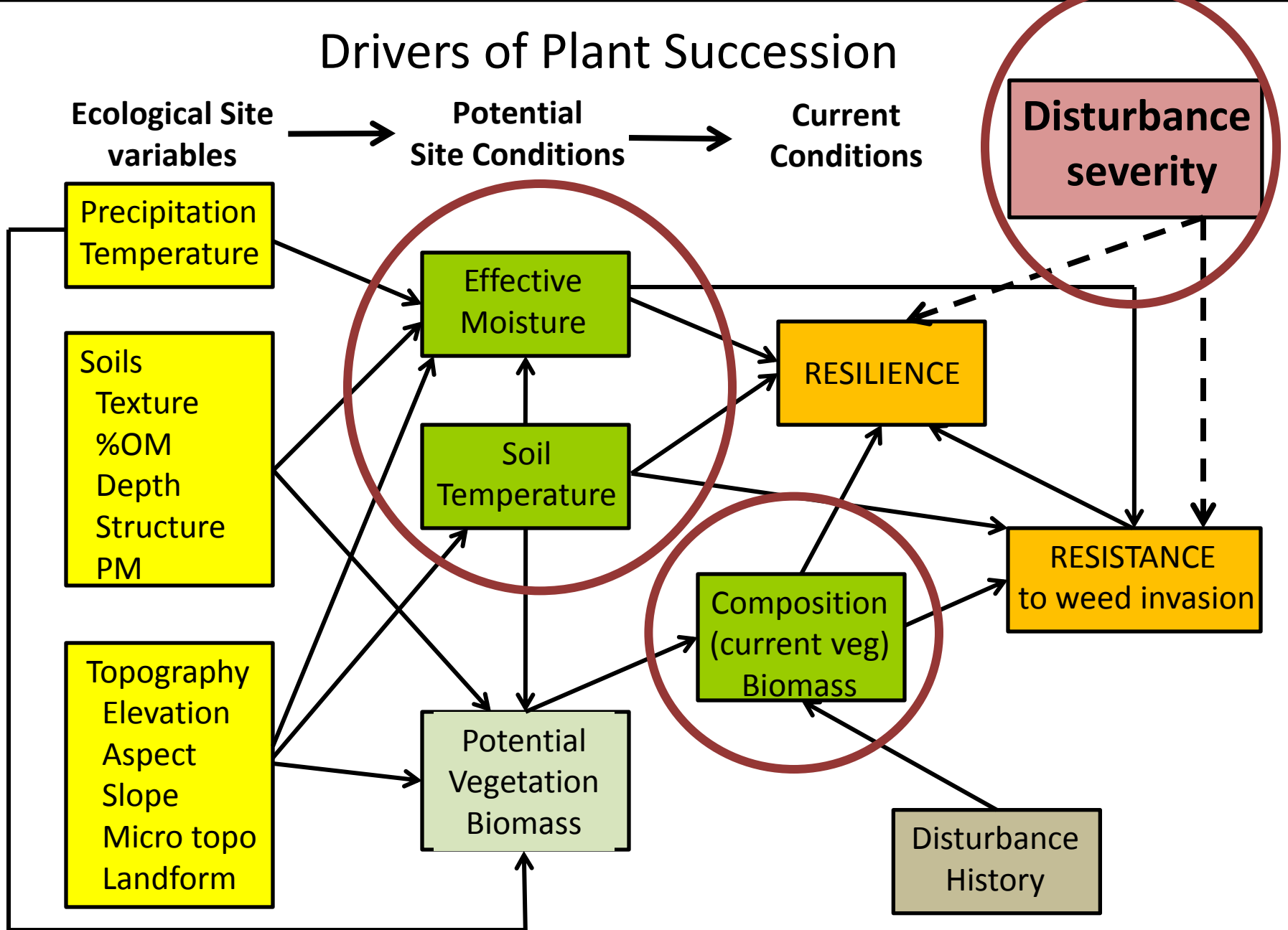


From Bates et al. 2007

Biotic Crusts



Drivers of Plant Succession



Seed Pools versus Residual Vegetation

