Making Post Drought Decisions

NM SRM/NDMC Drought Workshop
Socorro
29 May 2013

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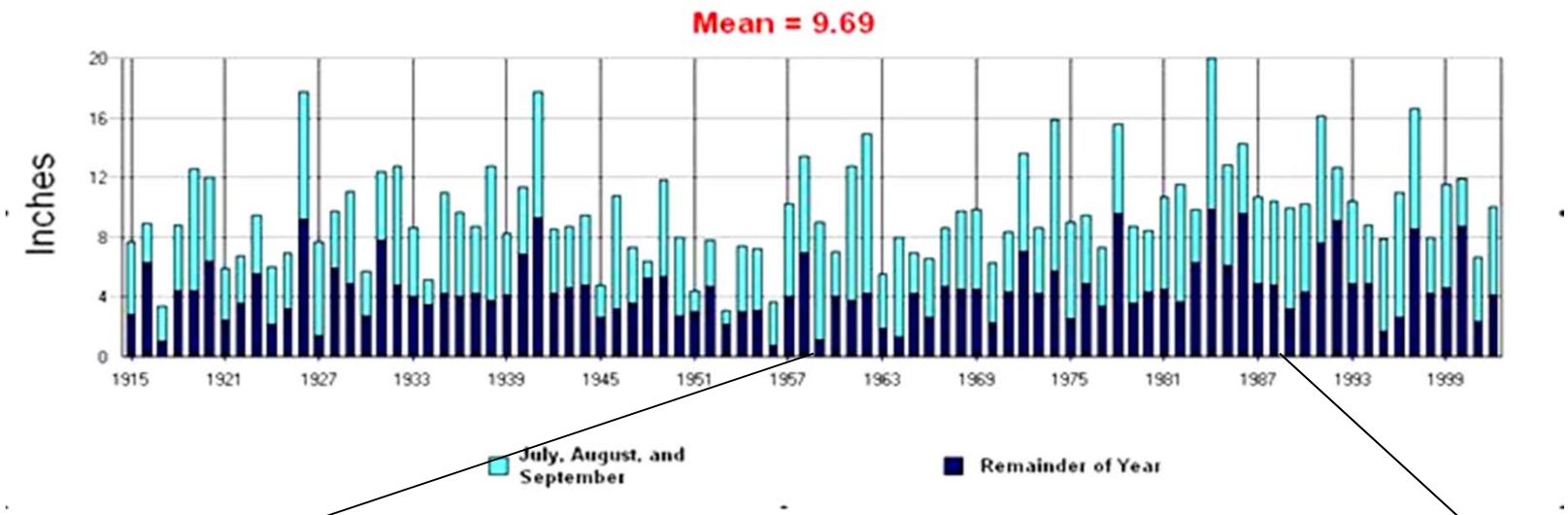
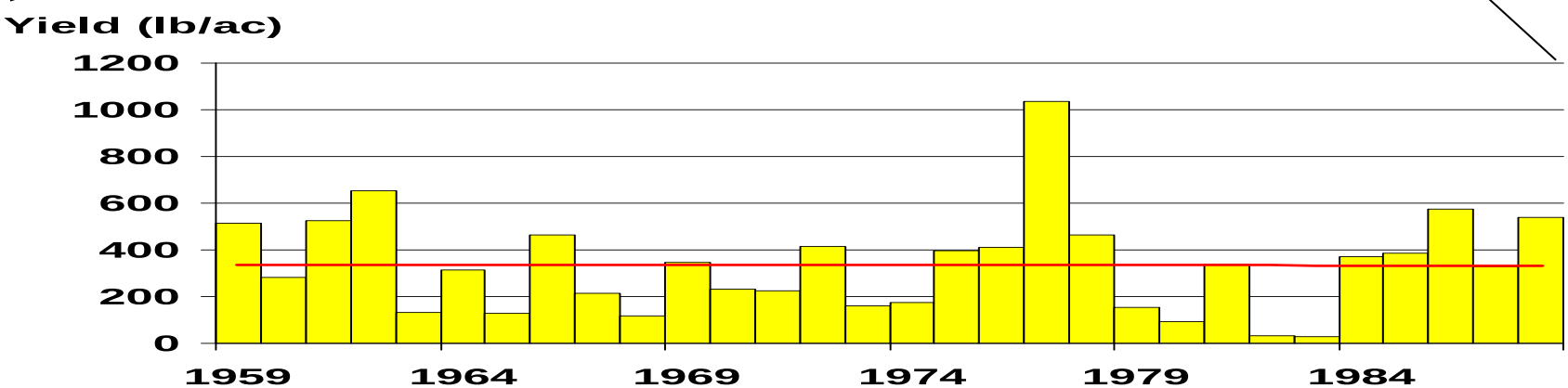
USDA NRCS
Jornada Experimental Range

MANAGING VARIABILITY (DROUGHT)



30 years of production on a Loamy site @ JER

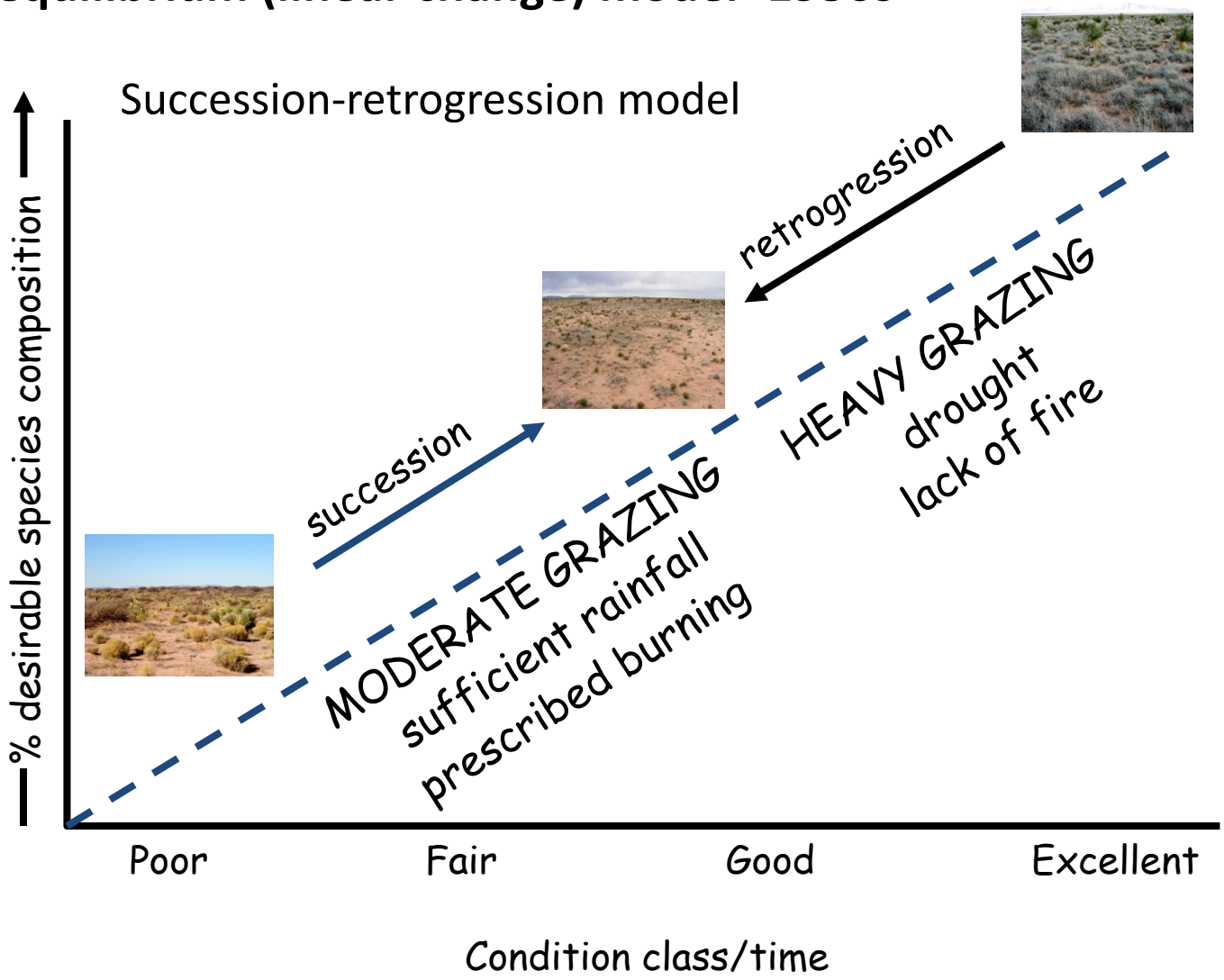


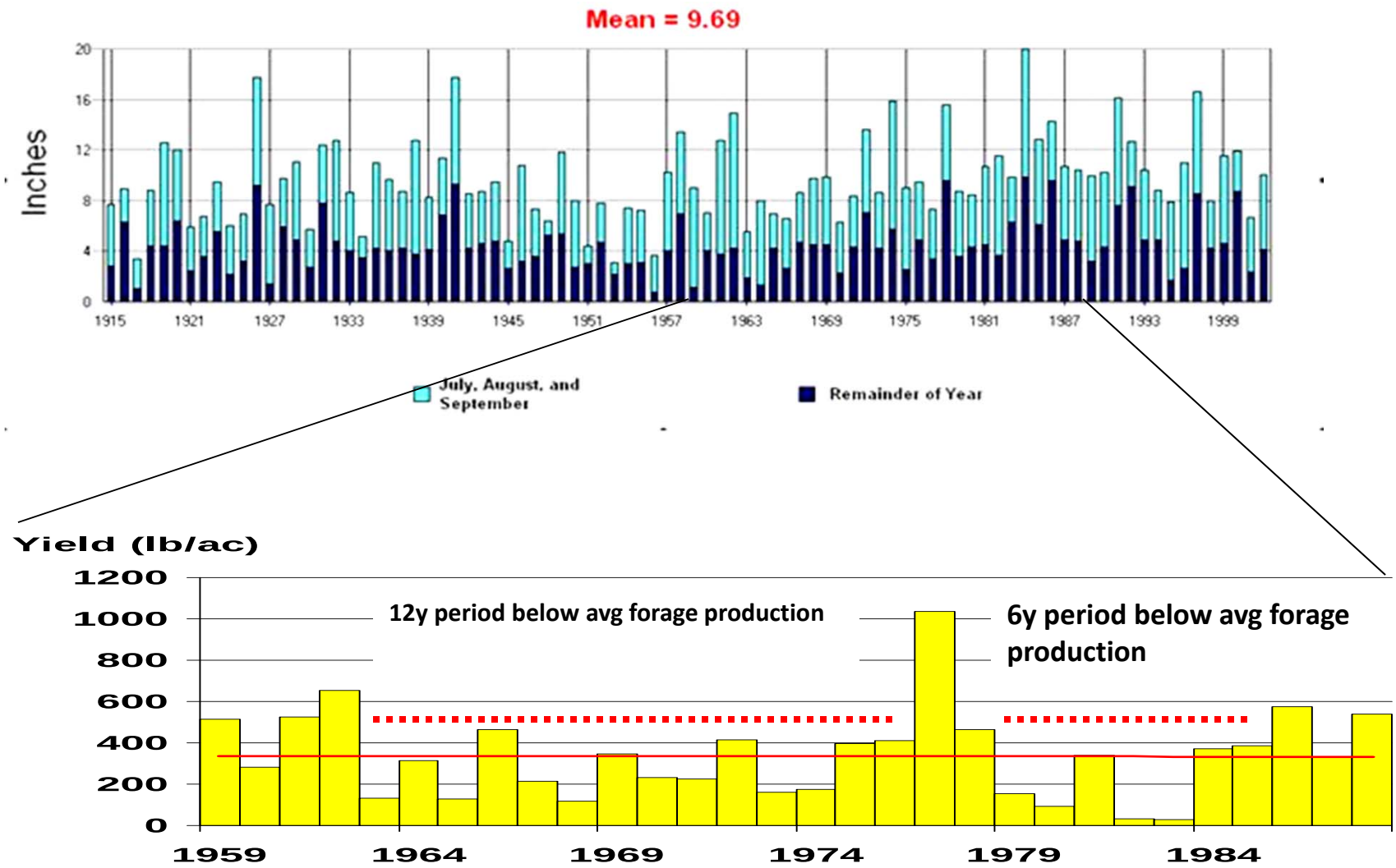
14 years below average

16 years above average

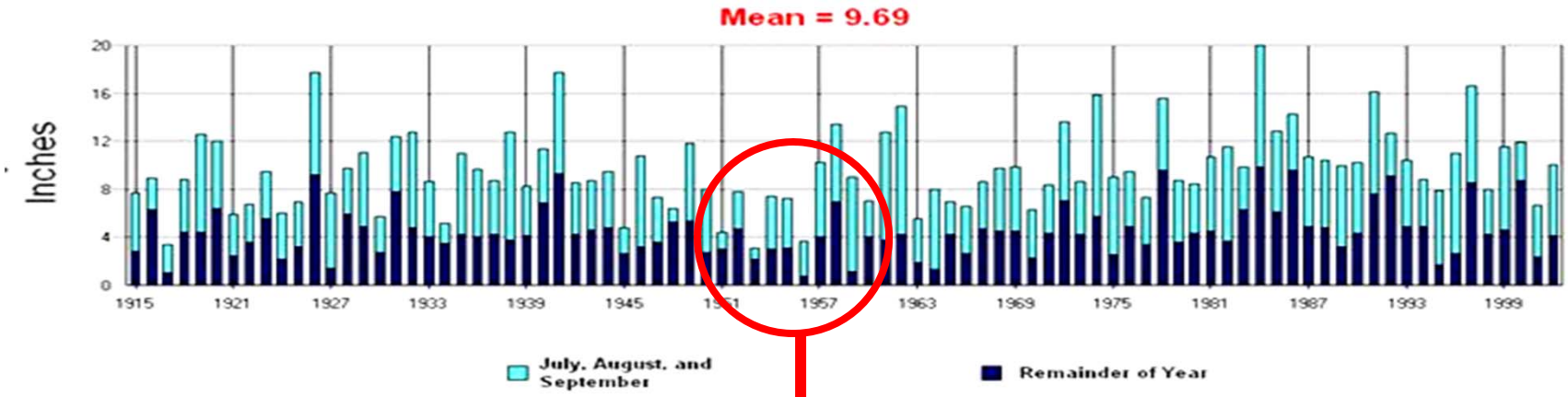
Temporal Variability

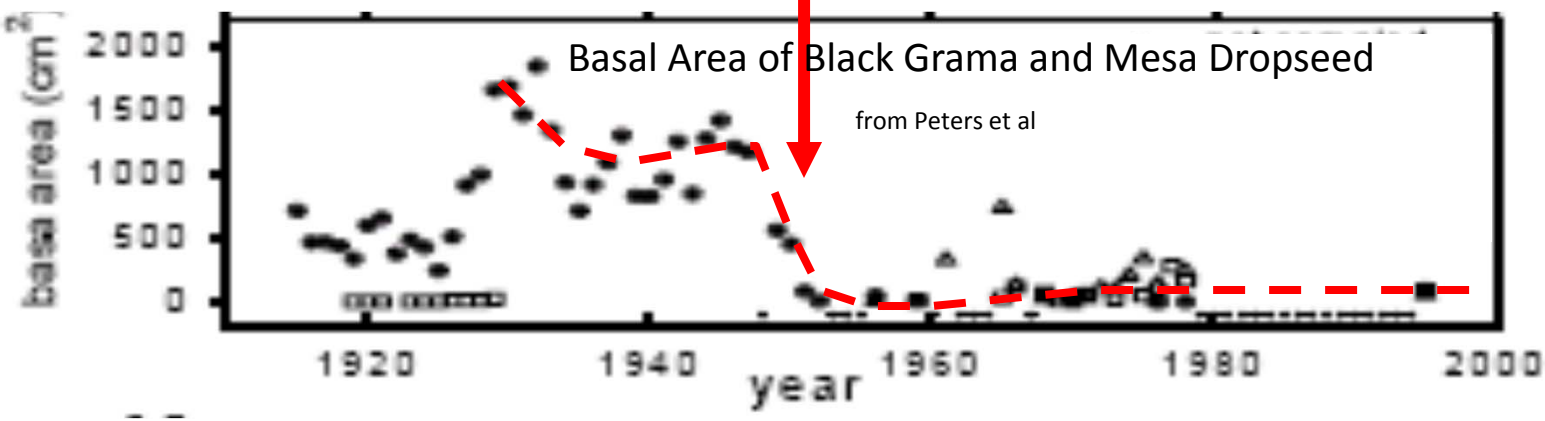
The equilibrium (linear change) model -1950s





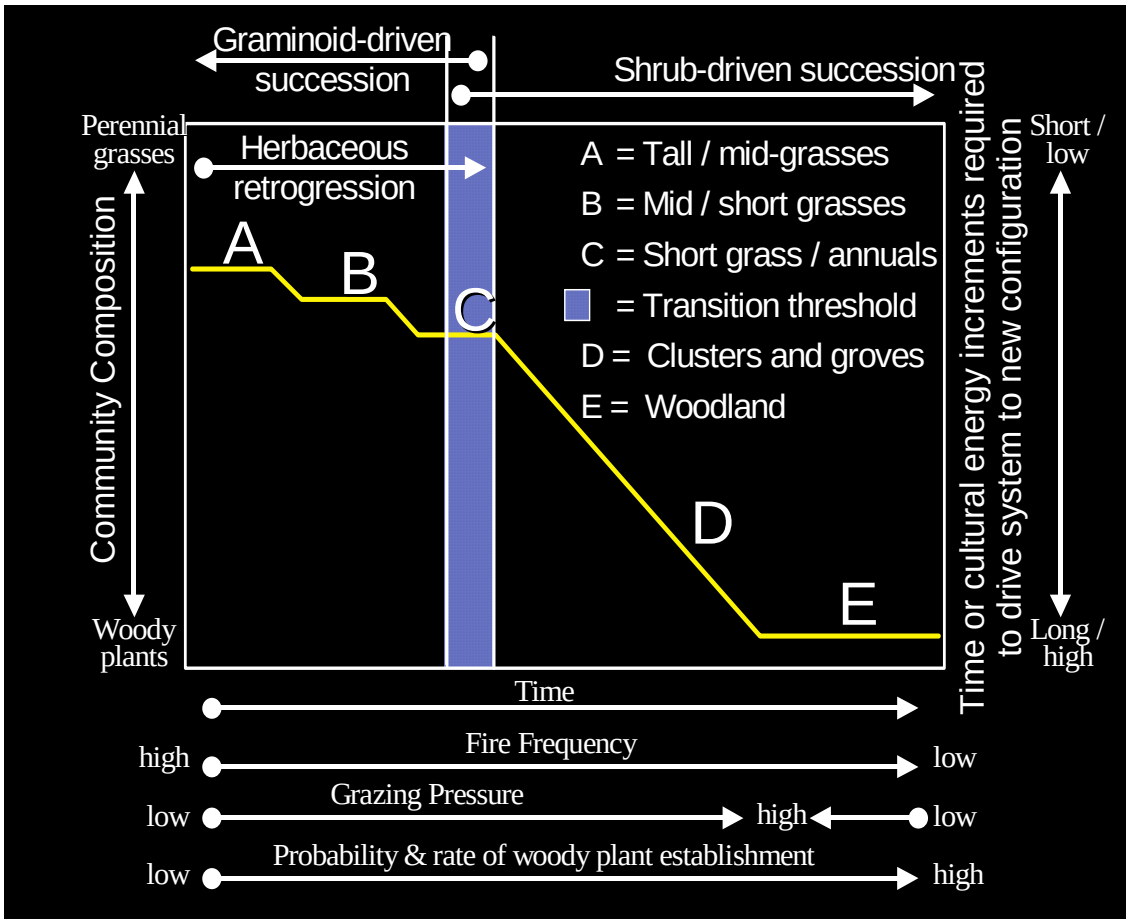
If your career as a rancher, researcher or advisor spanned the 30 y from 1960 to 1990, you would have been confronted with this scenario


Mean = 9.69
Inches
20
16
12
8
4
0
1915
1921
1927
1933
1939
1945
1957
1963
1969
1975
1981
1987
1993
1999
July, August, and September
Remainder of Year


Basal Area of Black Grama and Mesa Dropseed
from Peters et al
basal area (cm²)
2000
1500
1000
500
0
1920
1940
1960
1980
2000
year

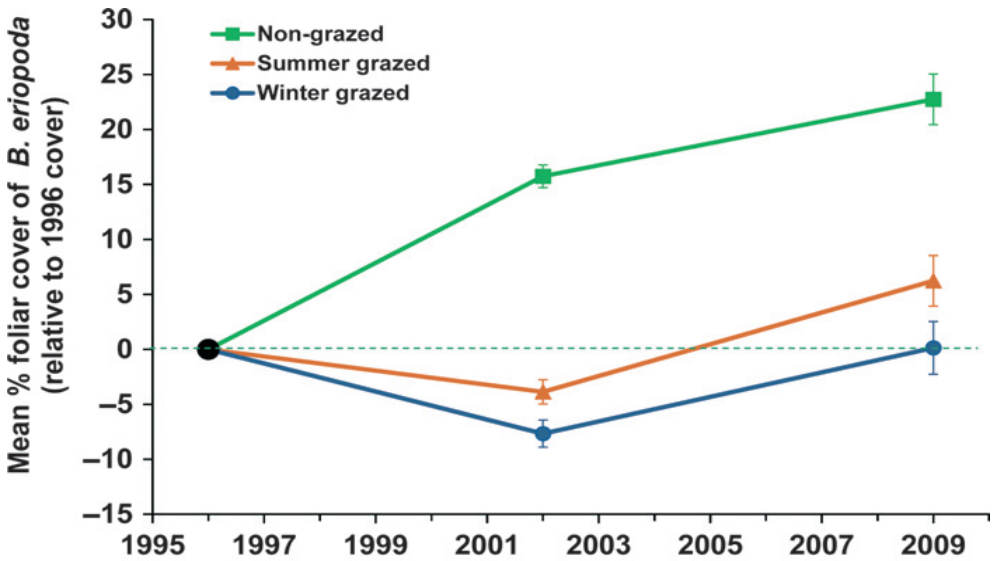
Temporal Variability

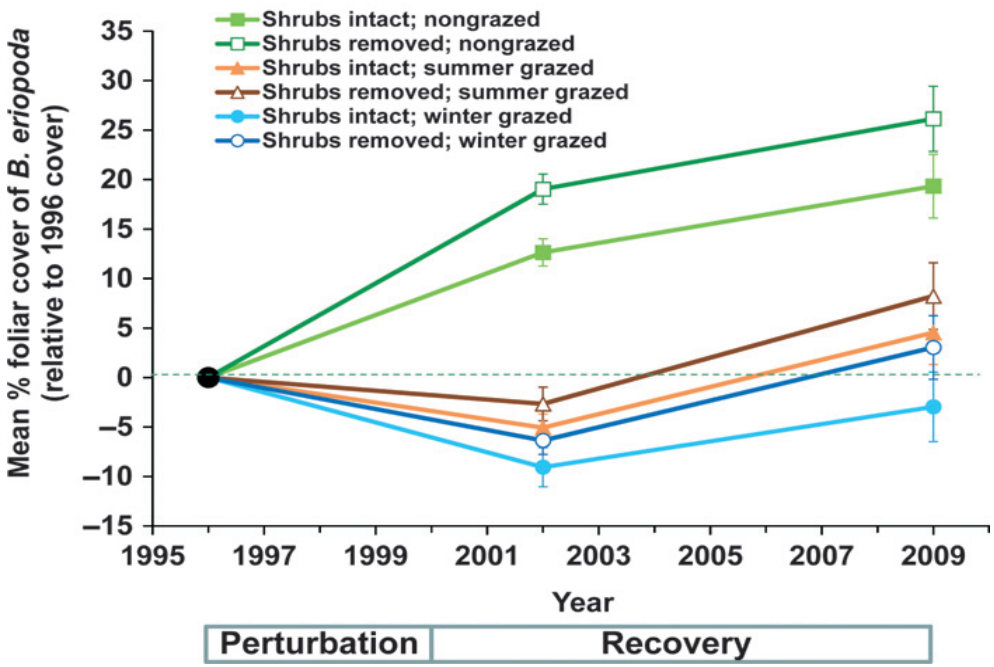
The nonequilibrium model -1990s



Archer (1989) 'Have southern Texas savannas been converted to woodlands in recent history?' identified multiple states and thresholds in shrub invasion

RECOVERY OF BLACK GRAMA

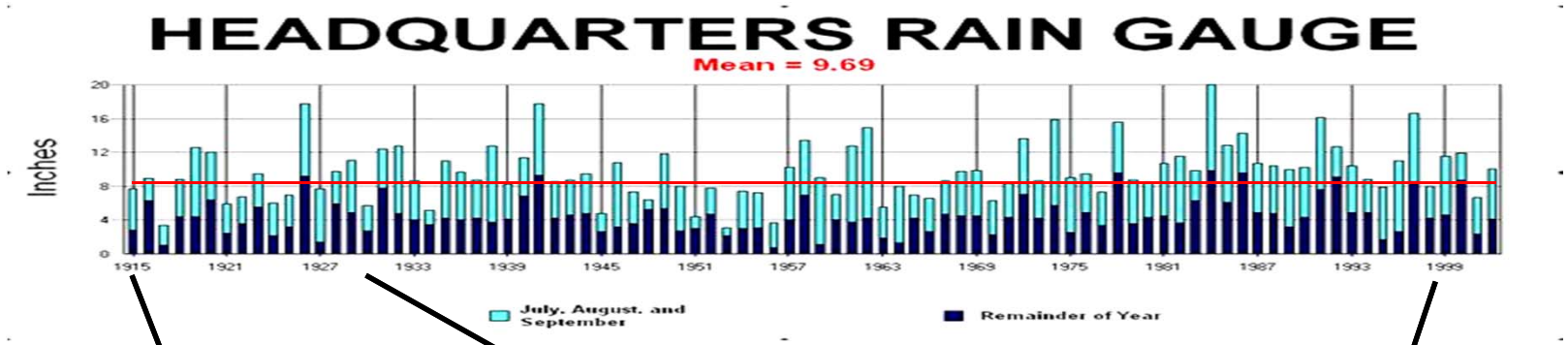


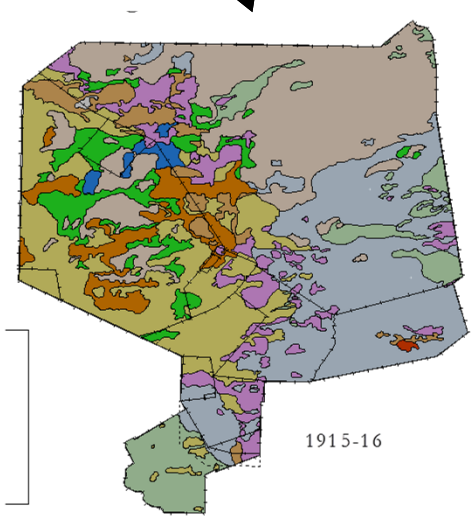


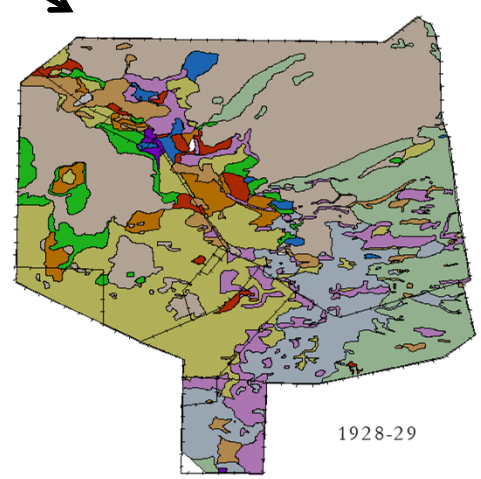
June 2004

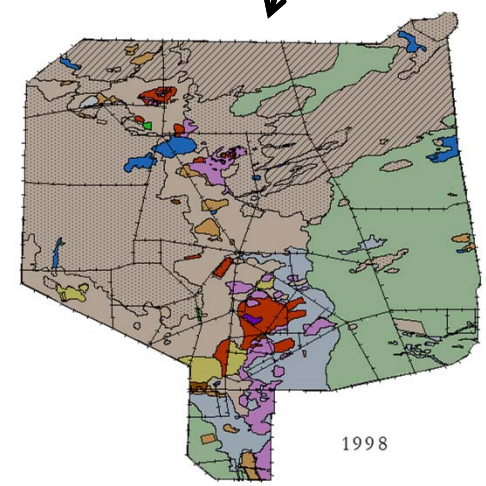
From Bestelmeyer et al 2013

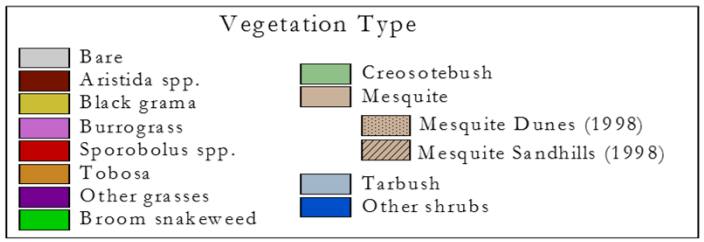
JORNADA EXPERIMENTAL RANGE





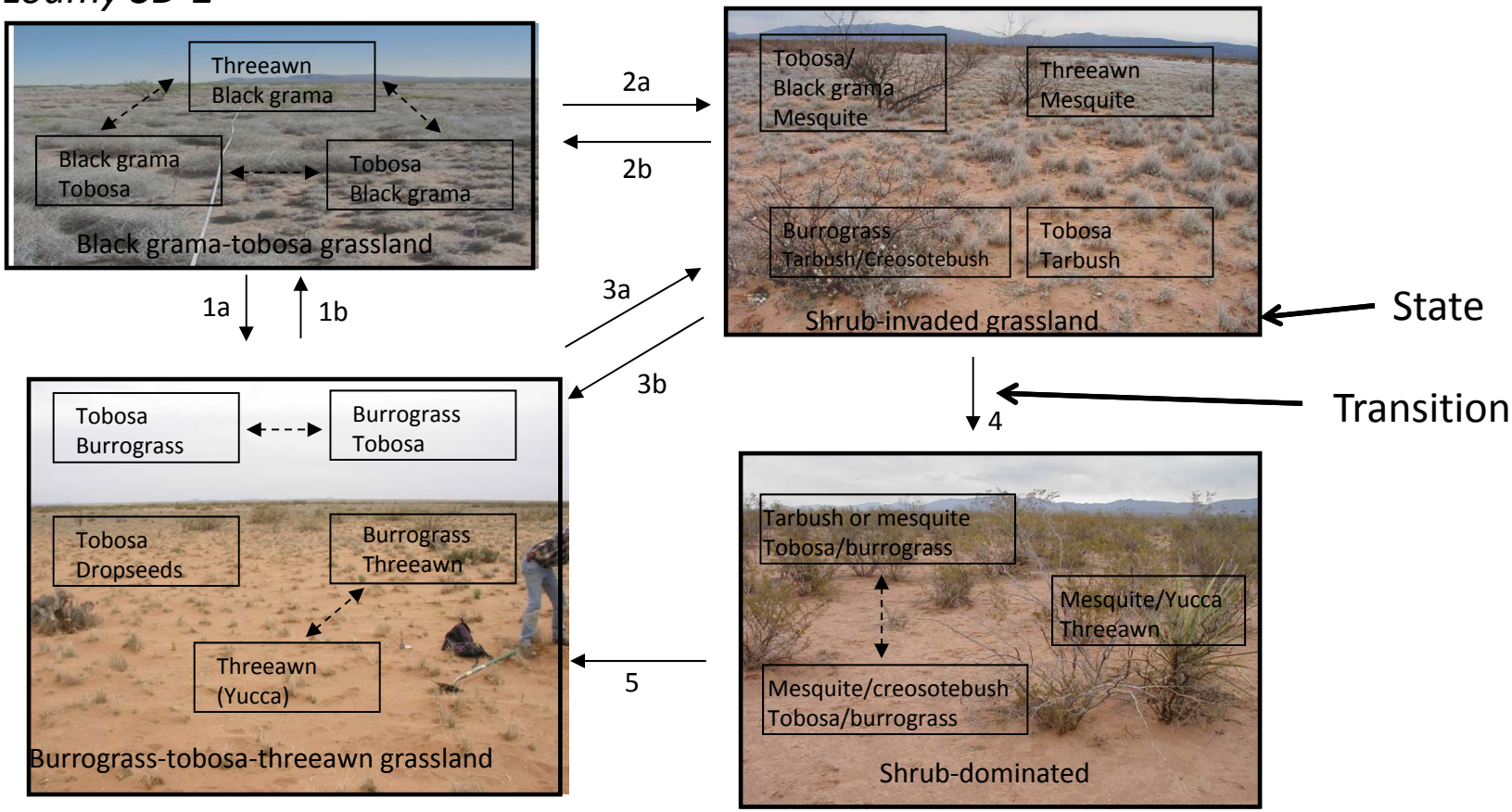






Organizing Information using State and Transition Models (STMs)

Loamy SD-2



States-relatively stable soil/vegetation configurations that require significant inputs to change

States possess unique ecological attributes and functions

Transitions-Drivers and processes that result in change, transitions include thresholds

From Bestelmeyer et al 2003

Making Drought Decisions

- Have a model of your system
  - Internal and external drivers
- Determine your current state
- Select a *viable* alternative
- Implement appropriate management actions (transitions)
- Monitor for progress
- Adapt, adjust, test