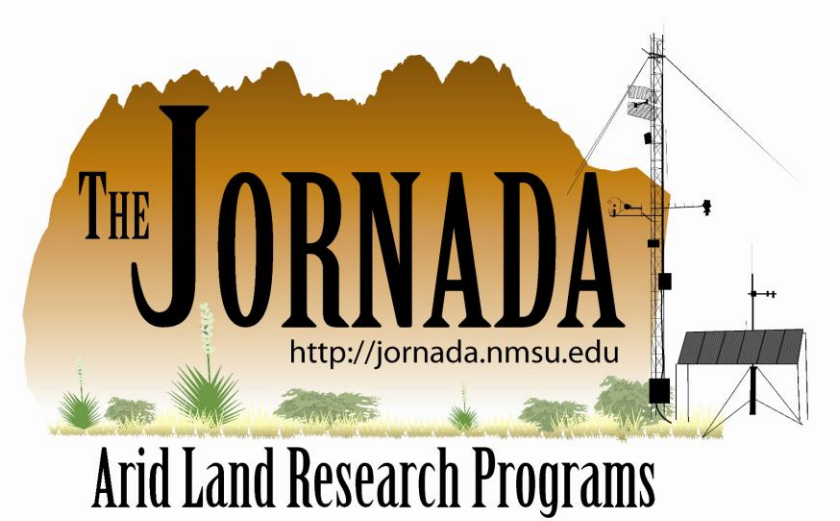
Coping with Drought on Rangelands: Concluding Remarks & Needed Directions



K.M. Havstad

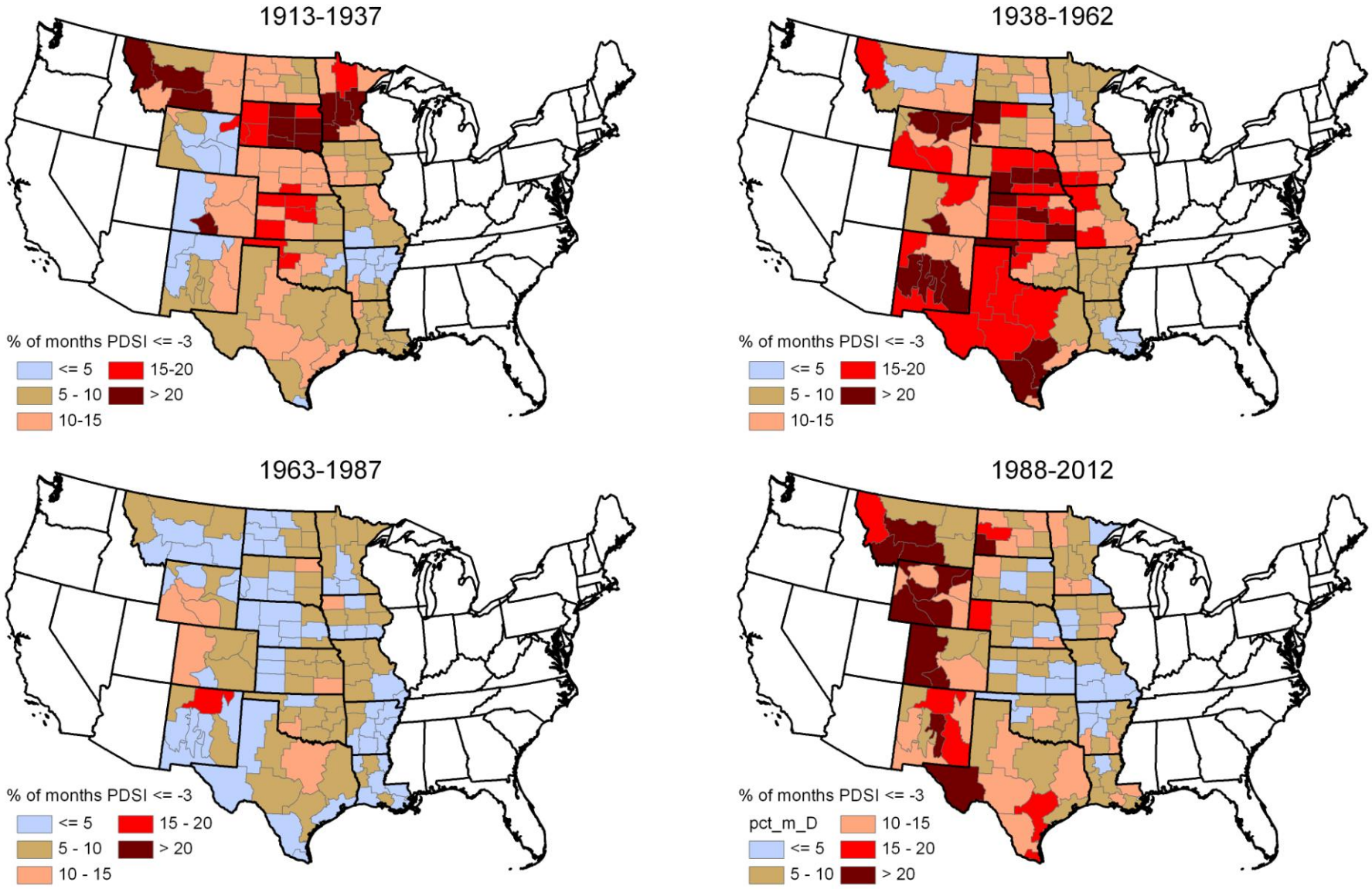
Summary Point #1

- "YIKES!"

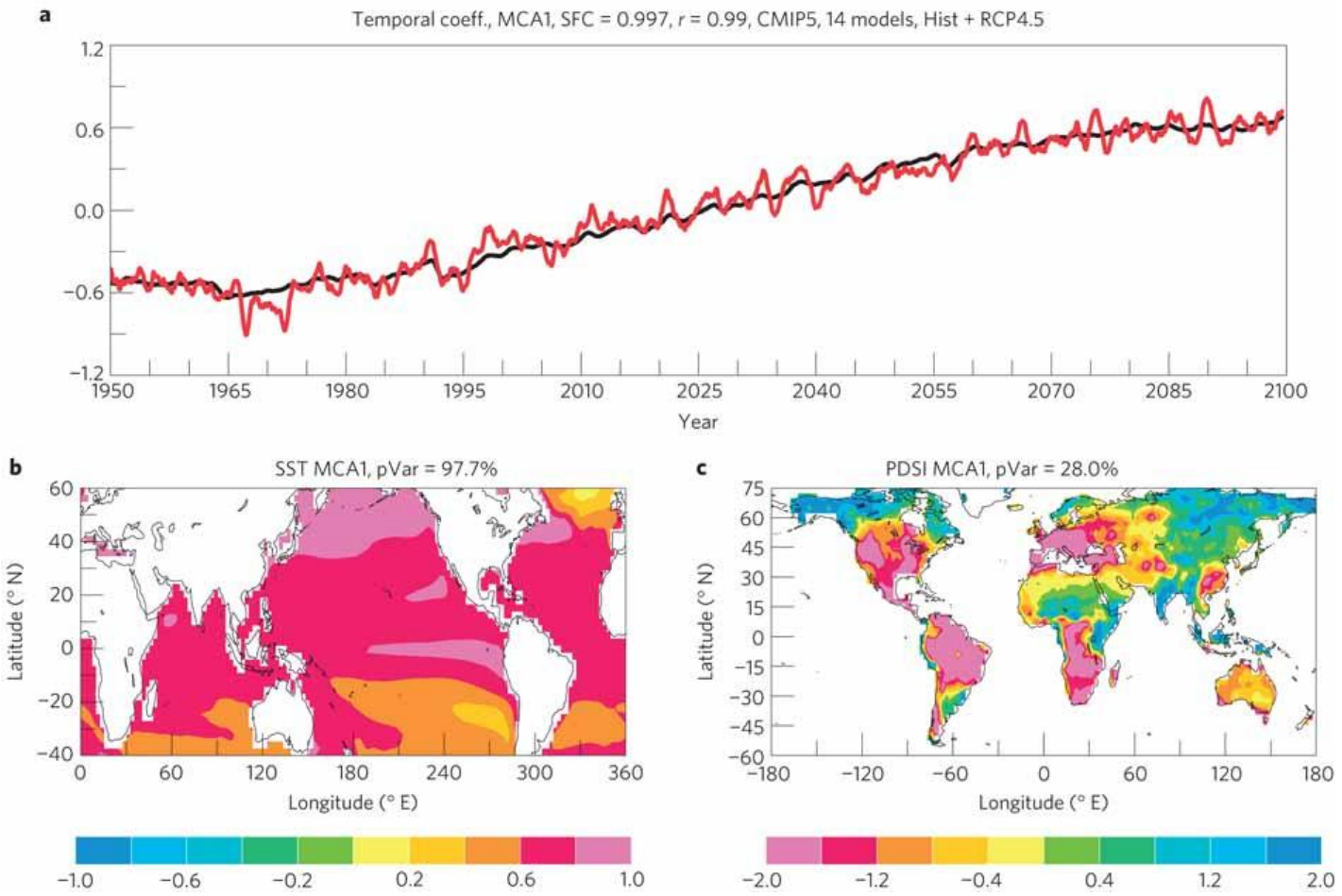
  From Gary McManus regarding the current drought in Oklahoma

- Expand on 2 key points regarding the past and the future

Palmer Drought Severity Index
% of months in severe and extreme drought



A Century of Dryness Interrupted by Periods of Extreme Drought



(change per 50 years)

Temporal and spatial patterns from coupled climate models [climatic variables and green house gasses (GHG)] for sea surface temperatures (SST) and the Palmer Drought Severity Index (PDSI) from 1950 – 2099 under future emission of GHG scenarios.

From: Dai (at the National Center for Atmospheric Research), 2013, Nature Climate Change 3: 52 58; Figure 5; "Historical records of precipitation, streamflow and drought indices show increased aridity since 1950 over many land areas…suggest increased risk of drought in the 21st Century."

Summary Point #2

- “Time to plan for the next rain is the current drought”
- Adaptive management and the use of local knowledge requires the need to “drill down”

  From Doug Tolleson
- But, how to do this? These mechanisms for today’s realities may not be in place…the other element of drilling down is sharing information..

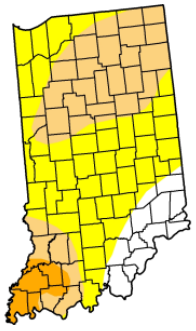
Extensive and Real Time Information Sources

U.S. Drought Monitor
Indiana

June 12, 2012
Valid 7 a.m. EST

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	11.60	88.40	39.44	5.16	0.00	0.00
Last Week (06/05/2012 map)	50.05	49.95	18.49	1.40	0.00	0.00
3 Months Ago (03/13/2012 map)	100.00	0.00	0.00	0.00	0.00	0.00
Start of Calendar Year (12/27/2011 map)	100.00	0.00	0.00	0.00	0.00	0.00
Start of Water Year (09/27/2011 map)	55.11	44.89	6.08	0.00	0.00	0.00
One Year Ago (06/07/2011 map)	100.00	0.00	0.00	0.00	0.00	0.00

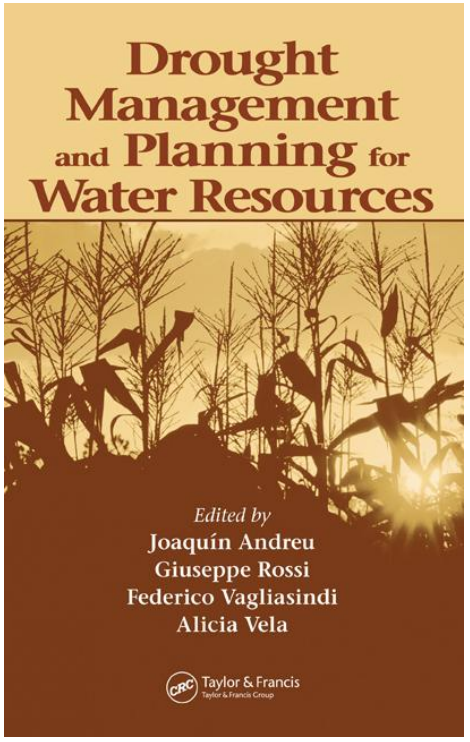


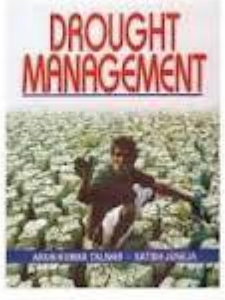
Intensity:
D0 Abnormally Dry
D1 Drought - Moderate
D2 Drought - Severe
D3 Drought - Extreme
D4 Drought - Exceptional

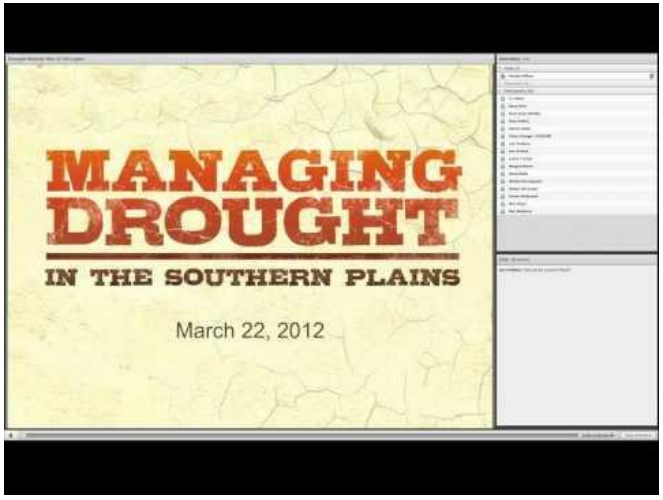
The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

http://droughtmonitor.unl.edu

Released Thursday, June 14, 2012
David Miskus, NOAA/NWS/NCEP/Climate Prediction Center







Summary Point #3

- “Neighboring Up”
- 4 spheres of interactions of drought Impacts:
  - Biophysical landscape
  - Economic landscape
  - Institutional landscape
  - Social landscape

  “We need to work to avoid disintegration of our communities so these don’t unravel”

  From Mark Brunson

  But, there are new externalities…

- Restocking post drought may be problematic in many regions:
  - U.S. beef cow herd declined 8.5% between 2007 and 2012; prolonged drought has provoked liquidation
  - 64% of producers are 55 or older & average farm/ranch size of older producers is 75% of average size for all ages; many may be unwilling to restock after extensive drought
  - Replacement inventories are substantially reduced and herd rebuilding will be financially difficult
  - Lending programs and policies that facilitate leasing for newer producers may be needed to rebuild the livestock industry post drought

From Peel 2013

Summary Point #4

- Spatially explicit information...our networks are improving tremendously
- If we have learned anything from 125+ years of research it is the importance of spatially explicit information for understanding biophysical processes and patterns in response to various drivers

From Jay Angerer and Ty Oschner

But, we need to apply the biophysical landscape filters….

Summary Point #5

- There is a real opportunity for us to inform if not drive a science and management based policy

From Joel Brown

Summary Point #6

- “Ranchers are increasingly concerned about drought preparedness as a way to mitigate their economic risks, however drought safety-net programs are getting larger and more complicated in the western US…”

From Layne Coppock and Amy Roedeer

Summary Point #7

- Thoughts into action; concerns primarily limited to what happened that year
- Helping people “standing their ground fighting against an enemy in a battle they may not win in the future…”
- Tremendous amount of information disseminated…

From David Kraft

Reflections

- So, this is our socio ecological system
- We need neighbor up, drill down, spatially explicit tools that recognize new externals, and that support a wide range of decision making models and
- We must recognize this is all dynamic