

Partnerships to Cope with Drought Insights from Rancher Decision-Making

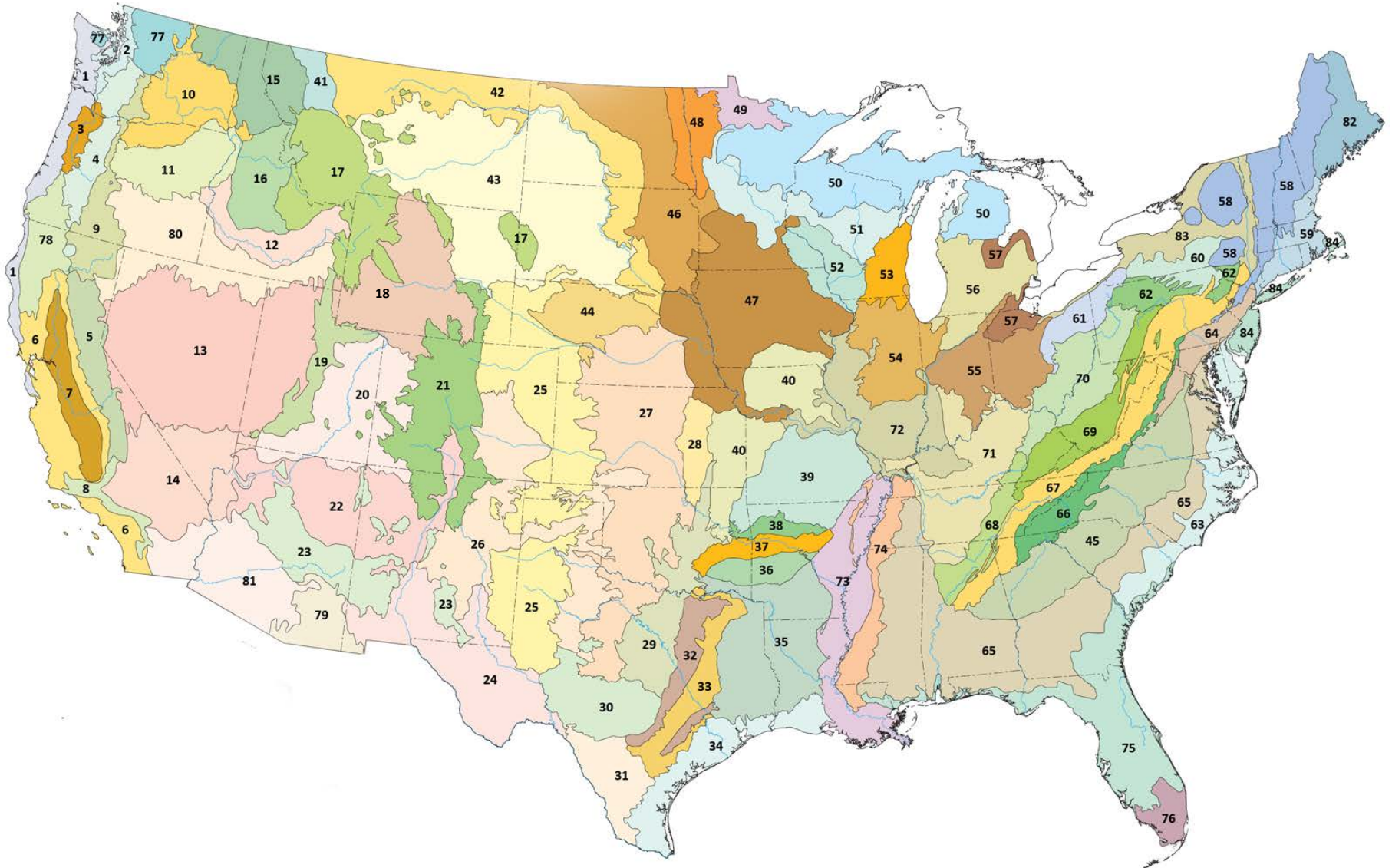


4th Rustici Rangeland Science Symposium

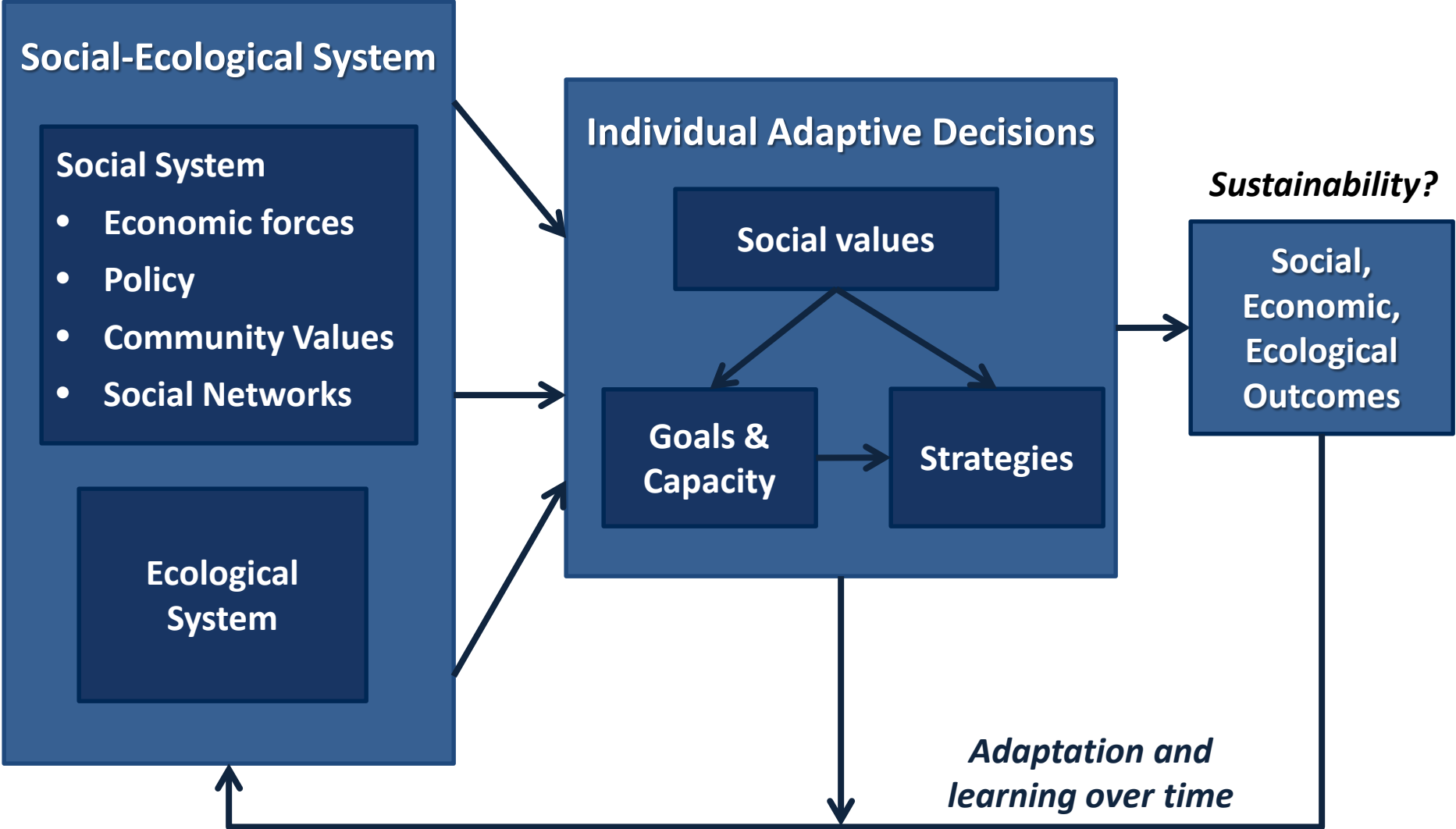
Leslie Roche^{1,2}, Dan Macon², Tracy Schohr²

UC Cooperative Extension¹ and University of California, Davis²

Ecological complexity of working landscapes



Rangeland managers make decisions within integrated social-economic-ecological system called “life”.



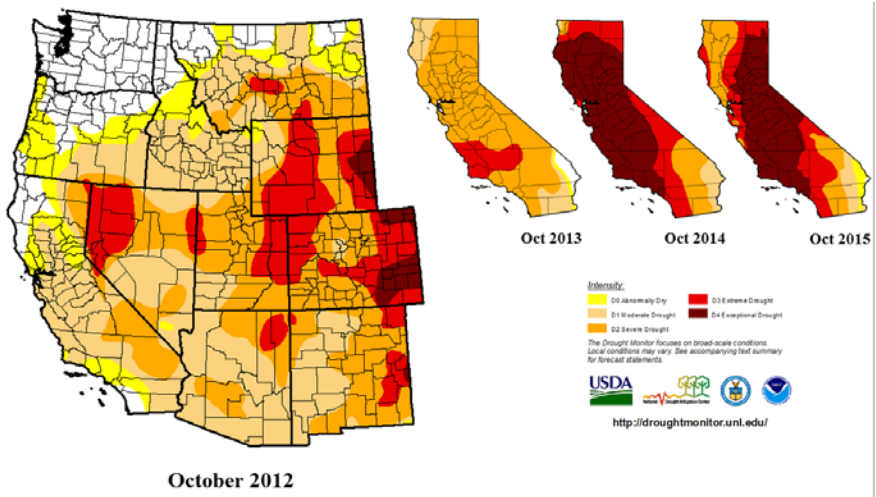
Expectations for multiple ecosystem services



CO₂

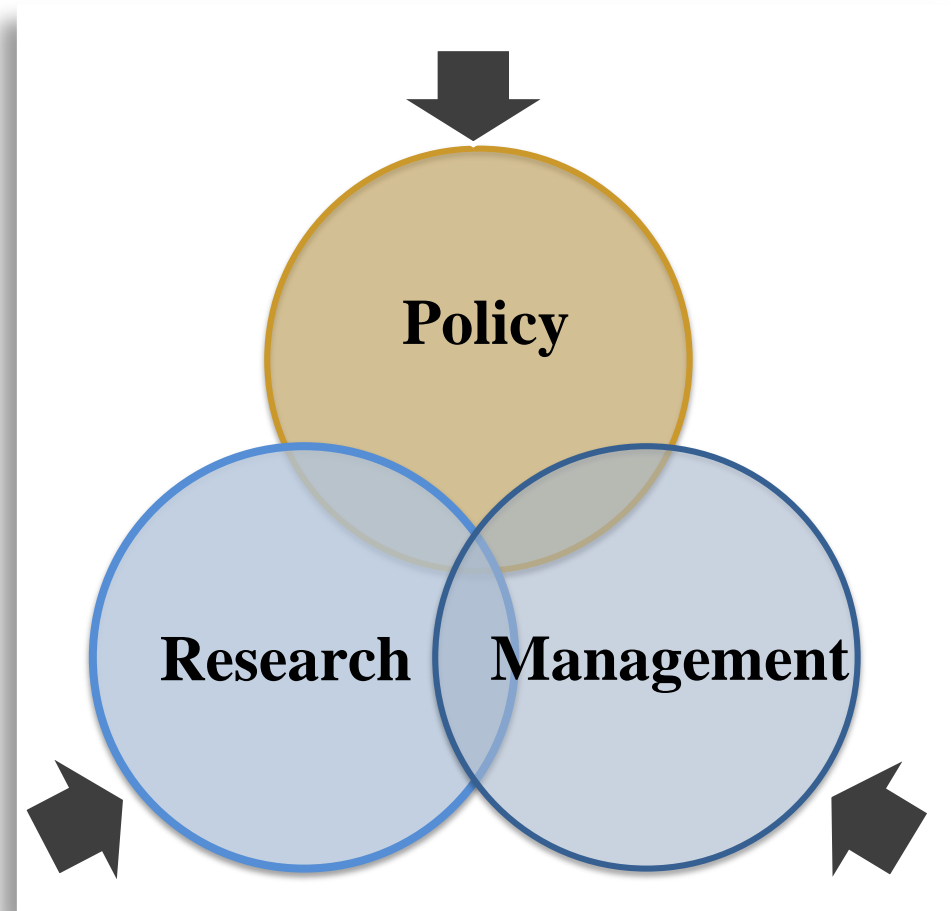


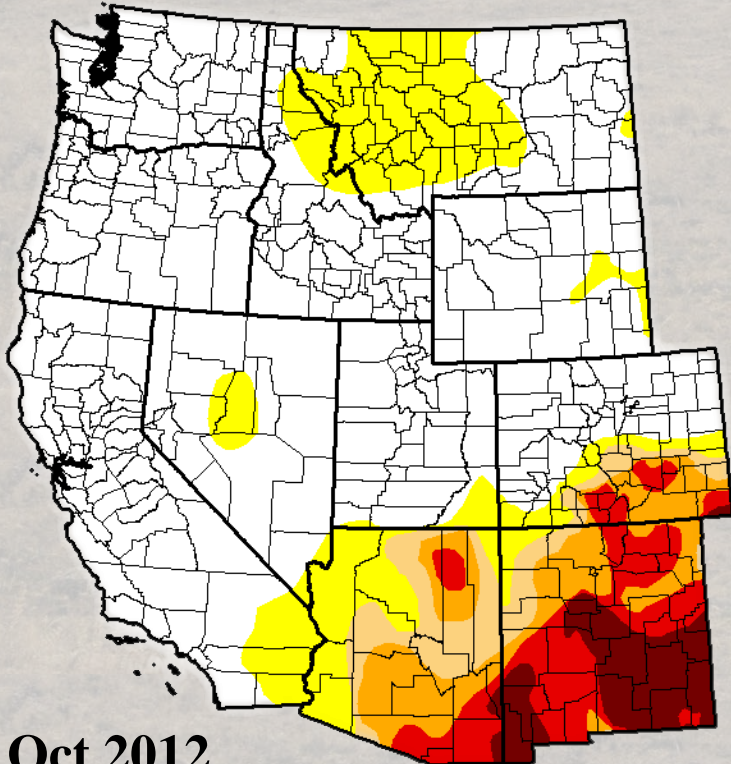
...in an already variable and changing environment



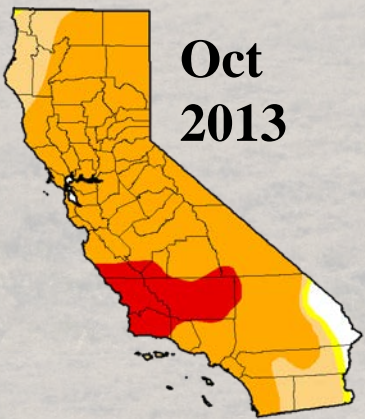
“ Partnerships among scientists, managers, and policymakers provide the most relevant knowledge... ”

Rangeland CEAP, 2011

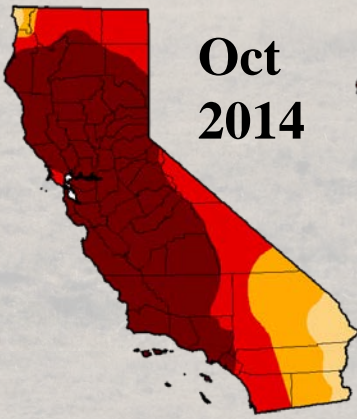




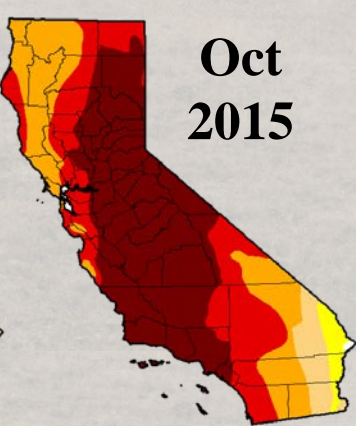
Oct 2012



Oct 2013








Oct 2014



Oct 2015

Intensity:

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



<http://droughtmonitor.unl.edu/>





Rancher Decision-Making Mail Survey 2011



California Ranch Stewardship Interviews



Collaborative Adaptive Management Project



Rancher Drought Interviews 2017



California Wool Growers Association

Unifying the voice of the California Sheep Industry since 1860





Rancher Decision-Making Mail Survey 2011



Drought Practices

Rancher Decision-Making Mail Survey (n = 479)

Proactive Practices (Drought Preparation)

%

Employ conservative stocking rates	35
Incorporate pasture rest into system	24
Incorporate cow-calf and stockers	22
Grass bank/Stockpile forage	13
Use weather predictions to adjust stocking	11
Add other livestock types for flexibility	3

Drought Practices

Reactive Practices (Drought Response)

%

Reduce herd size

71

Purchase feed

70

Gov't assistance programs

40

Wean early

40

Rent additional pasture

27

Move livestock to another location

24

Earn off-ranch income

23

Sell retained yearlings

22

Place livestock in a feedlot

8

Allow livestock condition to decline

7

Add alternative on-ranch enterprise

4

Practices

Reactive

- Reduce herd size
- Purchase feed
- Wean early
- Gov't assistance
- Rent pasture
- Move livestock
- Off-farm income
- Sell yearlings
- Feedlot livestock
- Allow condition declines
- Alt on-farm enterprise

Proactive

- Stock conservatively
- Rest pastures
- Cow-calf/yearlings
- Grass bank
- Use weather predictions
- Other livestock types

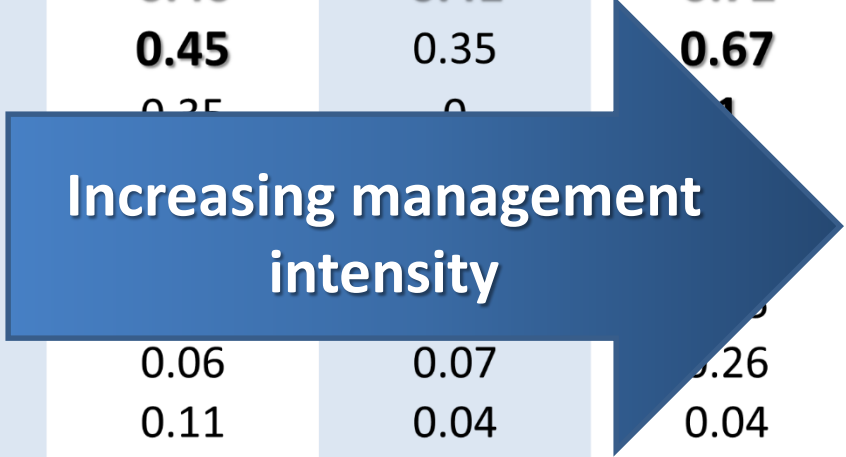
***How do people
put practices
together to
form an overall
strategy?***

Drought Strategies

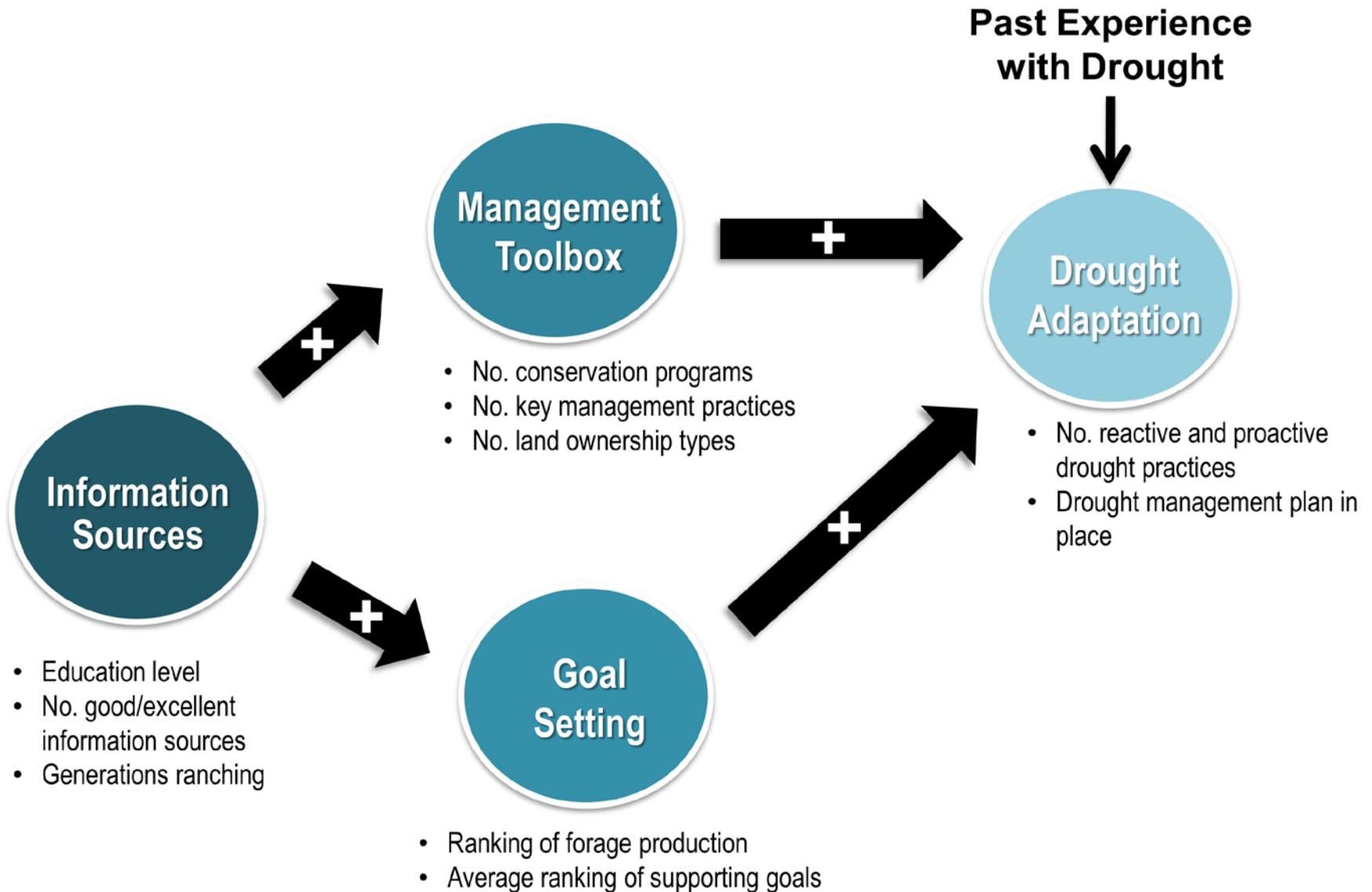
Practices		Class 1	Class 2	Class 3	Class 4
Reactive	Reduce herd size	0.08	0.69	0.86	0.91
	Purchase feed	0.13	0.88	0.64	0.75
	Wean early	0	0.40	0.41	0.72
	Gov't assistance	0.01	0.45	0.35	0.67
	Rent pasture	0.02	0.35	0	1
	Move livestock	0.06	0.20	0.18	0.75
	Off-farm income	0	0.22	0.30	0.28
	Sell yearlings	0	0.14	0.34	0.35
	Feedlot livestock	0	0.06	0.07	0.26
	Allow condition declines	0	0.11	0.04	0.04
	Alt on-farm enterprise	0.04	0.03	0.06	0.06
Proactive	Stock conservatively	0.03	0.22	0.53	0.53
	Rest pastures	0	0.11	0.41	0.36
	Cow-calf/yearlings	0.03	0.03	0.40	0.49
	Grass bank	0	0.08	0.18	0.23
	Use weather predictions	0	0.05	0.19	0.18
	Other livestock types	0	0	0.06	0.05

Drought Strategies

Practices		Class 1	Class 2	Class 3	Class 4
Reactive	Reduce herd size	0.08	0.69	0.86	0.91
	Purchase feed	0.13	0.88	0.64	0.75
	Wean early	0	0.40	0.41	0.72
	Gov't assistance	0.01	0.45	0.35	0.67
	Rent pasture	0.02	0.25	0	0.1
	Move livestock	0.06			
	Off-farm income	0			
	Sell yearlings	0			
	Feedlot livestock	0	0.06	0.07	0.26
	Allow condition declines	0	0.11	0.04	0.04
	Alt on-farm enterprise	0.04	0.03	0.06	0.06
Proactive	Stock conservatively	0.03	0.22	0.53	0.53
	Rest pastures	0	0.11	0.41	0.36
	Cow-calf/yearlings	0.03	0.03	0.40	0.49
	Grass bank	0	0.08	0.18	0.23
	Use weather predictions	0	0.05	0.19	0.18
	Other livestock types	0	0	0.06	0.05



Individual Drought Adaptation





Impacts, Management, Planning After Drought 2017



California Wool Growers Association

Unifying the voice of the California Sheep Industry since 1860



Drought Practices

Proactive Practices	Cattle Producers (%)	Sheep Producers (%)
Incorporate pasture rest	90	86
Grass bank/Stockpile forage	81	68
Employ conservative stocking rates	67	64
Purchase forage insurance	48	38
Use weather predictions to adjust	38	48
Incorporate new classes of animals	33	21
Add other livestock species	9	25

(n = 60)

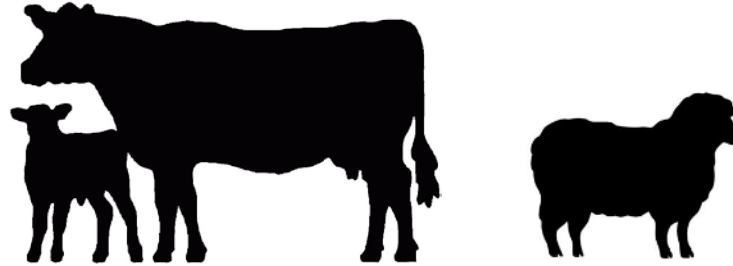
Drought Practices

Reactive Practices	Cattle Producers (%)	Sheep Producers (%)
Purchase feed	76	82
Gov't assistance programs	62	71
Wean early	57	57
Sell retained yearlings	52	54
Reduce herd/flock size	48	71
Allow livestock condition declines	33	25
Rent additional pasture	29	25
Alt on-ranch enterprise	14	21
Move livestock	10	14
Place livestock in a feedlot	14	14
Earn off-ranch income	5	11

Drought Impacts

Drought Impacts (2012-2015)	% of respondents	Severity (1 to 5)
Reduced forage production	98	3.9
Increased expenses	90	3.6
Tree/brush mortality	67	3.1
Reduced stock water	63	4.0
Reduced surface water	59	3.7
Increased invasive weeds	56	3.3
Reduced weaning weights	47	3.2
Reduced revenue	45	3.5
Reduced reproductive rates	43	3.1
Increased herd health problems	38	3.3
Increased wildfire severity	33	4.1

On-Ranch Impacts, Management, and Planning Horizons Following Severe Drought



Statement

Strongly disagree \Rightarrow Strongly agree

1

2

3

4

5

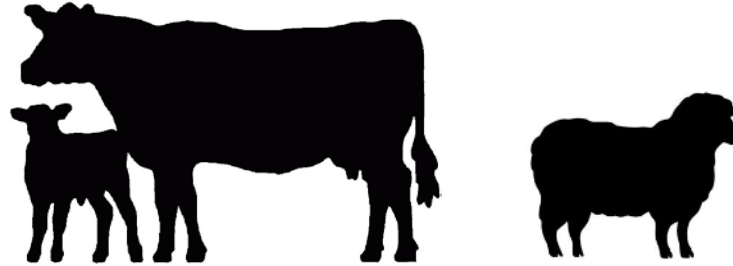
Climate change is **NOT** an important consideration when developing options for my ranching business, relative to other current issues.

I do **NOT** believe that the future climate will be any different from my past experience.

I feel confident that I already have the skills to manage for long-term drought.

I am interested in learning about climate change and its impacts on the ranching industry.

On-Ranch Impacts, Management, and Planning Horizons Following Severe Drought



Statement

Strongly disagree ⇒ Strongly agree

1 2 3 4 5

Climate change is **NOT** an important consideration when developing options for my ranching business, relative to other current issues.

2.4

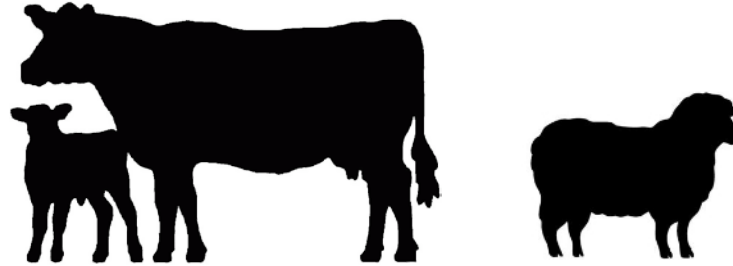
I do **NOT** believe that the future climate will be any different from my past experience.

2.3

I feel confident that I already have the skills to manage for long-term drought.

I am interested in learning about climate change and its impacts on the ranching industry.

On-Ranch Impacts, Management, and Planning Horizons Following Severe Drought



Statement

Strongly disagree ⇒ Strongly agree

1 2 3 4 5

Climate change is **NOT** an important consideration when developing options for my ranching business, relative to other current issues.

2.4

I do **NOT** believe that the future climate will be any different from my past experience.

2.3

I feel confident that I already have the skills to manage for long-term drought.

3.6

I am interested in learning about climate change and its impacts on the ranching industry.

3.5



- Drought strategies: *large toolbox of proactive and reactive practices.*
- Capacity to cope with drought increases with information networks, goal setting, and toolbox of options.
- Policy and planning should take into account diversity of strategies developed—reduce vulnerability across all operation types.



Irrigated Pasturelands

A regionally coordinated, research, training, and extension education program on irrigated pastureland enhancement strategies.

[Learn more](#)



Managing for Drought

Ranchers and researchers working together to develop management tools for adaptation strategies for drought.



Public Lands Grazing

Mountain meadows and riparian areas across the western United States constitute a unique and critical natural resource.



Irrigated Pasturelands

We are working with land managers to develop research, training, and extension programs on irrigated pastureland enhancement strategies.



Rangeland Drought Hub

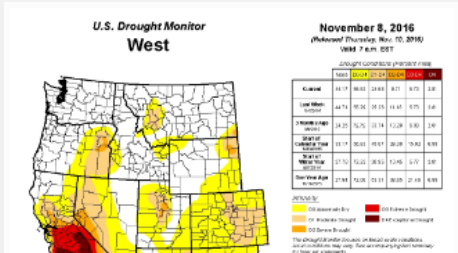


Voices from the Drought

A SoundCloud playlist curated by UC Rangelands



Drought Indicators



Twitter, Rangeland and Drought

Rangeland Drought
A Twitter list by @RangeDrought

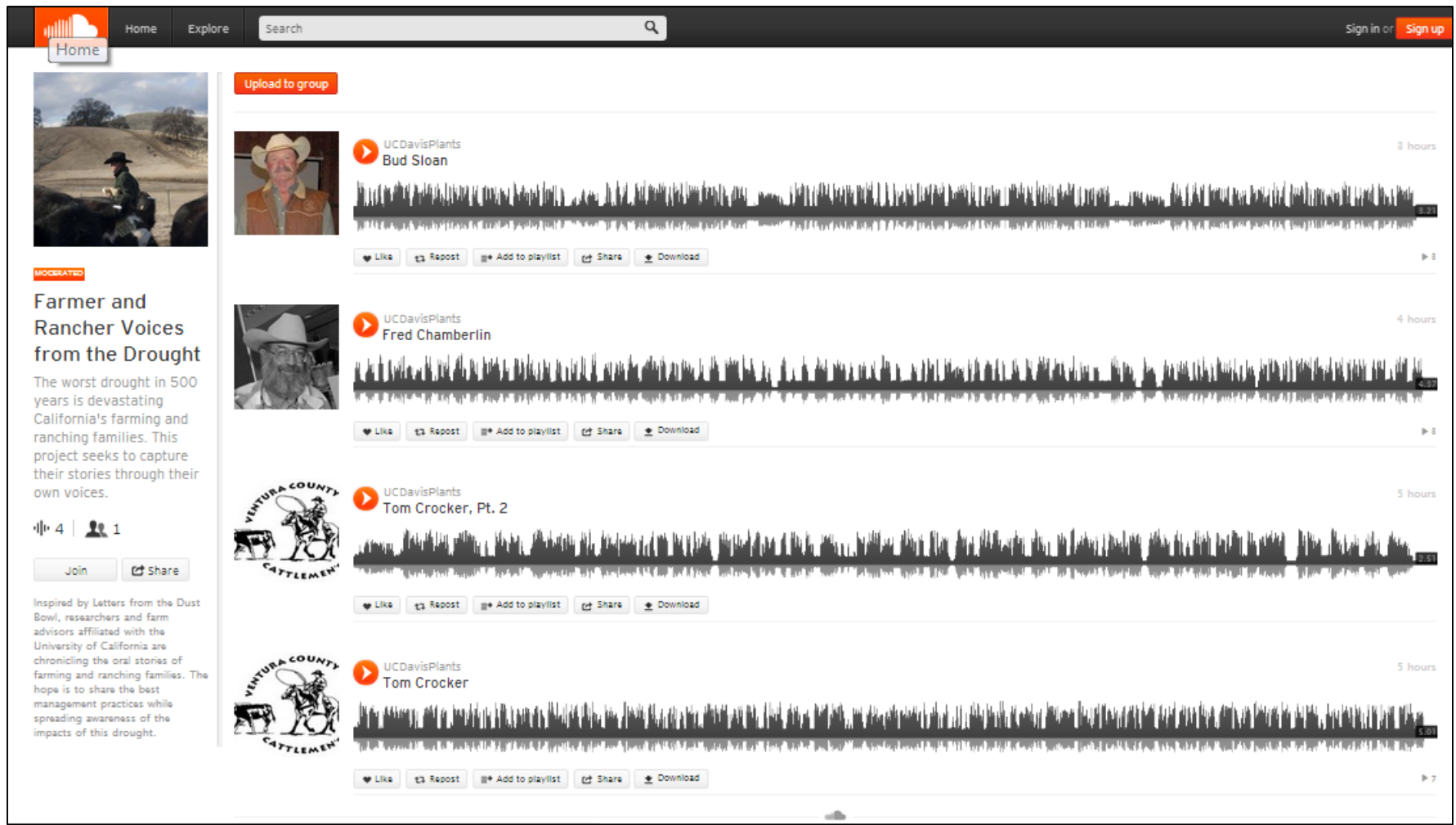
Tweets about drought and climate change impacts on California Rangeland.



Farmer and Rancher Voices from the Drought

A chronicle of oral stories of farming and ranching families.

<https://soundcloud.com/groups/farmer-and-rancher-voices-from-the-drought>



The screenshot shows a SoundCloud group page with a dark header. The header includes a 'Home' button, 'Explore' and 'Search' options, and a 'Sign in or Sign up' link. The main content area is divided into a left sidebar and a main list of audio tracks.

Left Sidebar:

- Home** (selected)
- Home** (button)
- Moderated** (tag)
- Farmer and Rancher Voices from the Drought** (title)
- The worst drought in 500 years is devastating California's farming and ranching families. This project seeks to capture their stories through their own voices.** (description)
- 4** (likes) | **1** (followers)
- Join** (button) | **Share** (button)
- Inspired by Letters from the Dust Bowl, researchers and farm advisors affiliated with the University of California are chronicling the oral stories of farming and ranching families. The hope is to share the best management practices while spreading awareness of the impacts of this drought.** (text)

Main Content Area:

- Upload to group** (button)
- UCDavisPlants Bud Sloan** (track title) - 3 hours
- UCDavisPlants Fred Chamberlin** (track title) - 4 hours
- UCDavisPlants Tom Crocker, Pt. 2** (track title) - 5 hours
- UCDavisPlants Tom Crocker** (track title) - 5 hours

Each track entry includes a profile picture, a play button icon, a waveform visualization, and interaction buttons: Like, Repost, Add to playlist, Share, and Download. The tracks are associated with the 'VENTURA COUNTY CATTLEMEN' logo, which features a cowboy on a horse.

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