

Drought Planning Resources for Agriculture

Presented by Retta Bruegger | retta.bruegger@colostate.edu



**COLORADO STATE UNIVERSITY
EXTENSION**

Drought Bad

7/25/12 4:00PM



Water Good



KANSAS CITY, MO—Sources nationwide are confirming this week that the current drought is bad and that water is very good. "We don't like the drought," local farmer Dan Rickey told reporters. "We like water." At press time, sources are confirming that the drought is still happening and that it's bad.

**Hoping for rain
is not a drought strategy**



MAKING A DROUGHT PLAN

- Make an Inventory
- Observe
- Determine Risk
- Lessons Learned

I. ASSESS

- Set Goals
- Brainstorm Strategies
- Set Decision Points or Triggers

II. PLAN

IV. LEARN & ADAPT

- Evaluate the Plan and Change

III. DO

- Implement Proactive and Reactive Practices

Why Drought Planning?



A rain doesn't get you out of the drought the next day. If you don't set a timetable and stick to what you say you'll do, you'll say: 'Well, I saw on the news where there's a 20% chance of rain a week from Friday. So, let's wait until then.' Well, you've got to quit doing that"



- John Welch, rancher and Past President and CEO of Spade Ranches.
Welch Cattle Company is a family cow/calf operation

Why Drought Planning?



01

A 2016 study in the U.S. Northern Plains found that ranchers with a drought plan:

- Were more likely to destock herds
- Saw less harm to range productivity

02

After 2012 and 2016 droughts, ranchers with a plan reported

- Decreased decision-making angst and uncertainty
- Faster and healthier recovery from drought



Drought Advisors

Drought Advisors is a network of professionals committed to improving access to technical resources for drought preparation and response among Colorado producers.



What we do

- Connect interested producers with technical professionals to create drought plans
- Build a network of producers and professionals to increase capacity to cope with drought
- Improve access to drought planning resources through trainings, online and written materials, and one-on-one consulting



Resources

droughtadvisors.org



01

Drought Leadership
Training

02

Drought Handbook

03

Drought website

04

Drought Plan Program



Website

droughtadvisors.org

- Drought Leadership Training
Searchable able of all past webinars
- Searchable table of all CSUE+ fact sheets Drought handbook



Colorado Agricultural

DROUGHT HANDBOOK



Colorado State University Extension is an equal opportunity provider. | Colorado State University does not discriminate on the basis of disability and is committed to providing reasonable accommodations. | CSU's Office of Engagement and Extension ensures meaningful access and equal opportunities to participate to individuals whose first language is not English.

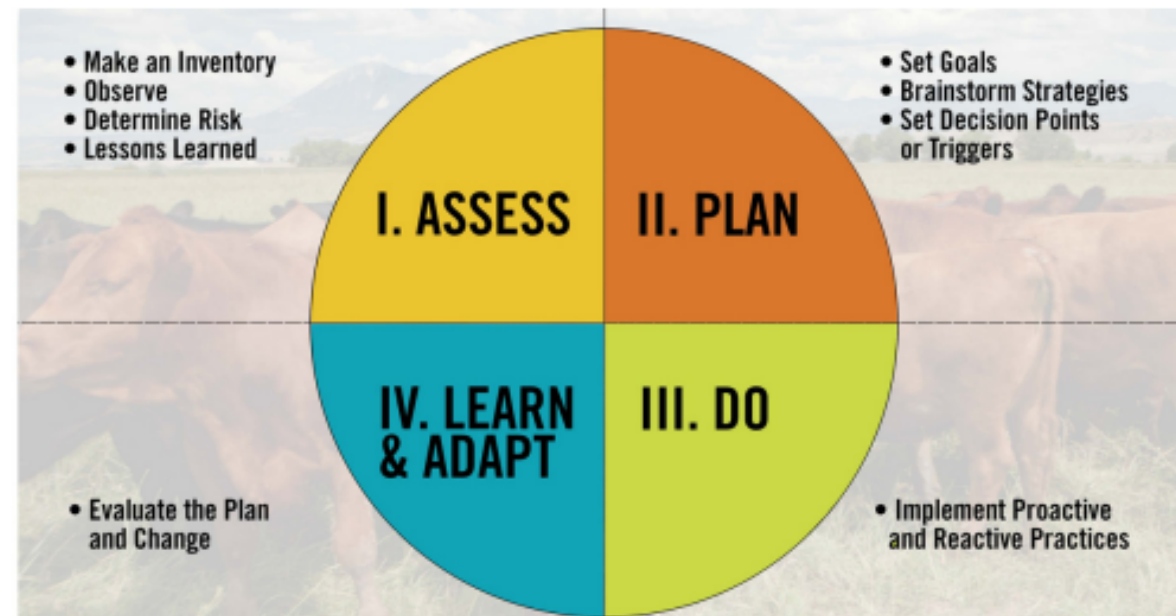
Colorado State University Extension es un proveedor que ofrece igualdad de oportunidades. | Colorado State University no discrimina por motivos de discapacidad y se compromete a proporcionar adaptaciones razonables. | Office of Engagement and Extension de CSU garantiza acceso significativo e igualdad de oportunidades para participar a las personas quienes su primer idioma no es el inglés. Col.st/11013

Drought Handbook

droughtadvisors.org

- **Making a Drought Plan**
- **Climate, Drought & Trigger Dates**
 - Weather in CO
 - Critical Periods by Region
 - Using Forecasts & Forecast Accuracy
 - Trigger Dates by Crop and Region
- **Drought Strategies**
 - Range and Livestock
 - Crops and Cropping Systems
 - Risk Management

Making A Drought Plan



Drought planning consists of six parts:

1. assessing the operation and resources,
2. creating a plan which includes
 - a. defining drought preparedness goals for the operation,
 - b. determining critical points (triggers) for making decisions,
 - c. identifying strategies to reduce risk,
 - d. using simple scenarios to prioritize strategies,
3. implementing the plan, and finally
4. adapting the plan based on what one learned.

In the following sections, we elaborate on each element of a drought plan and include links to corresponding worksheets which may be used in the planning process.

A drought plan can take many forms. It can be as simple as a one page written document (see examples in [Appendix 1](#), and [Drought Plan template](#) below and in [Appendix 4](#)).

In addition, each section of the Making a Drought Plan chapter has worksheets associated with it. These worksheets are intended to help users brainstorm aspects of creating a plan.

Regardless of the written form, the key ingredients are defining goals, triggers, and strategies. How the plan is written down depends on what is meaningful and useful to the producer acting on the plan.

Drought Handbook

droughtadvisors.org

- Making a Drought Plan
- Climate, Drought & Trigger Dates
 - Weather in CO
 - Critical Periods by Region
 - Using Forecasts & Forecast Accuracy
 - Trigger Dates by Crop and Region
- Drought Strategies
 - Range and Livestock
 - Crops and Cropping Systems
 - Risk Management

WORKSHEET #8

Drought Plan Template

A drought plan can be as simple as a 1-2 page document that includes, goals, a basic inventory, strategies, and critical dates. Use this template to bring it all together.

Goal(s) for Drought Management (max 3):

Inventory:

- Average Precipitation and Variability
- Other:

Strategies for Increasing Drought Preparedness

Critical Decision-making Dates and Triggers

Strategies for Managing During Drought

Worksheet adapted from: Guide to Co-Developing Drought Preparation Plans for Livestock Grazing on Southwest National Forests by handbook at: <https://cals.arizona.edu/droughtandgrazing/>

WORKSHEET #4, Long-term Example

Identifying Issues and Strategies

Issues with Drought Preparation	Possible Strategies <i>What are potential strategies to this specific issue?</i>	Farm/Ranch Goal Addressed <i>How will addressing this issue enable you to reach your operation's goals?</i>	Priority <i>What's the feasibility and impact of the strategy?</i>	Potential Partners <i>Given the cost or scale, do you need additional partners?</i>
<i>Example (ranching)</i> Cattle herd size is almost at full capacity; any decline in forage likely to result in needing to sell cows	<ul style="list-style-type: none"> • Change the herd composition to incorporate yearlings or stockers; therefore, more flexible • Consider more conservative stocking rate • Seek alternative forage by renting/leasing pastures 	Reduce economic impact of drought by increased flexibility and preparation.	Low Medium High	NA
<i>Example (farming)</i> Profitability of dryland wheat is increasingly unreliable due to warmer temperatures and dry springs.	<ul style="list-style-type: none"> • Plant perennial forages on a percentage of acres for dryland grazing. • Increase acreage under no-till to improve soil moisture retention • Explore specialty certifications, like organic, to capture value with reduced production. 	Reduce economic impact of drought by diversifying crops and capturing value from crops.	Low Medium High	NA
<i>Example (irrigation efficiency)</i> With ongoing/recent drought, irrigation supplies are not reliable and fail to provide as much water as in the past with shorter irrigation seasons.	<ul style="list-style-type: none"> • Transition percent of fields to more efficient irrigation systems (flood to side rolls). • Build additional storage • Acquire additional water rights • Increase civic engagement in discussion shaping basin-wide policy 	Reduce economic impact of drought by increasing reliability in our water supply, and extend water availability later in the season.	Low Medium High	NRCS; water lawyer, seek other potential partners for infrastructure funding

Worksheet adapted from: Guide to Co-Developing Drought Preparation Plans for Livestock Grazing on Southwest National Forests by Hawkes et al., 2018. Full handbook at: <https://cals.arizona.edu/droughtandgrazing/>



Drought Handbook

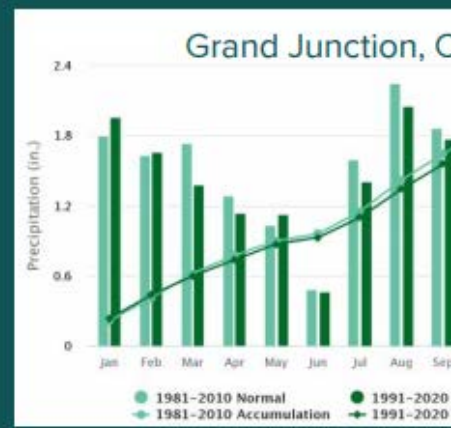
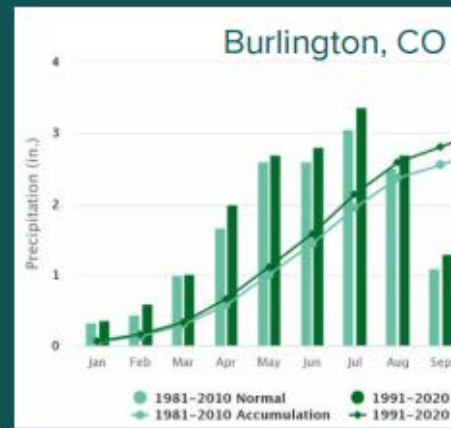
droughtadvisors.org

- Making a Drought Plan
- Climate, Drought & Trigger Dates
 - Weather in CO
 - Critical Periods by Region
 - Using Forecasts & Forecast Accuracy
 - Trigger Dates by Crop and Region
- Drought Strategies
 - Range and Livestock
 - Crops and Cropping Systems
 - Risk Management

Climate, Drought, and Trigger Dates

Seasonality of Precipitation Varies Greatly

Compare the difference the shape of the curve showing average precipitation between Burlington and Grand Junction. While June is among the wettest average month in Burlington, it is the driest on average in Grand Junction. These patterns impact the ecology and production of the region. This information for the region of interest is critical for making informed decisions. From: [The Colorado Climate Center](#)

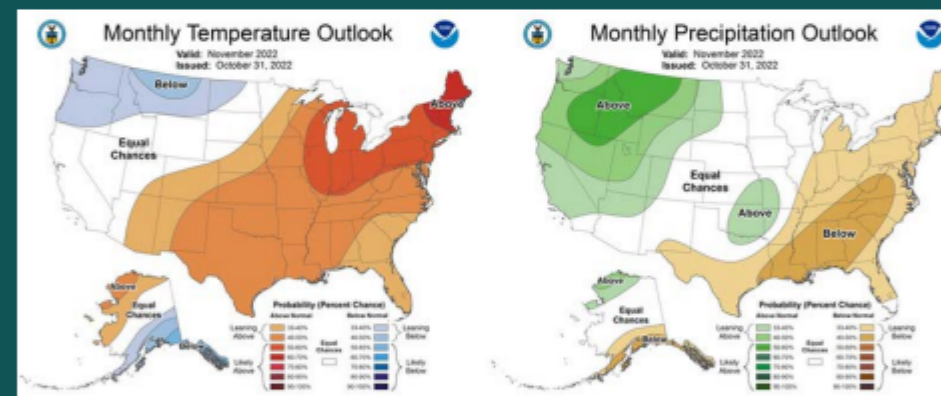


Climate, Drought, and Trigger Dates Using Forecasts

When used as a guide for future planning, the temperature and precipitation outlooks can be one tool in the toolbox for making more informed decisions. The outlooks can be used to determine which scenarios are more or less likely. Another application is to use them with tools like [GrassCast](#) (discussed below in Triggers). This is a product that shows what grassland production may look like in near average, wetter than average, and drier than average conditions. Using the seasonal outlooks with [GrassCast](#) can inform a producer which scenario may be more or less likely to occur.

Using 30-day Temperature & Precipitation Forecasts from the Climate Prediction Center

Climate forecasts are generated using models to predict weather averages using a vast array of information from many sources. While conventional weather forecasts make predictions ranging from 1-10 days in advance, climate forecasts predict climatic conditions on a larger timescale of at least one month up to several years. NOAA's Climate Prediction Center maps, like the images displayed below, generate 30 and 90-day seasonal temperature and precipitation outlooks every month.



What They Tell You

- These maps tell you the probability of above or below average conditions occurring.
- The darker the color, the higher the likelihood of an outcome. For example, the darker the red the stronger the probability of warmer temperatures for that region, and conversely the darker the blue the stronger the probability of below average temperatures.
- Intended to be used on a broad scale to help analyze temperature and precipitation predictions.

What They Do Not Tell You

- Do not tell you what is average
- "Leaning/Likely above/below normal" does not provide context for how much above or below normal temperatures or precipitation will be.
- These maps do not indicate the onset or recovery status of drought.
- For day-to-day decisions, it is strongly recommended to rely more on site-specific observations and knowledge.

Drought Handbook

droughtadvisors.org

- Making a Drought Plan
- Climate, Drought & Trigger Dates
 - Weather in CO
 - Critical Periods by Region
 - Using Forecasts & Forecast Accuracy
 - Trigger Dates by Crop and Region
- Drought Strategies
 - Range and Livestock
 - Crops and Cropping Systems
 - Risk Management

Drought Strategies Range & Livestock

Introduction

Most ranchers in Colorado and throughout the western United States

In This Section

Strategies Long-term Preparation

- Rangeland management before drought
- Stocking conservatively
- Resting pasture and grass-banking
- Herd composition/diversification
- Investing in infrastructure
- Multiple enterprises
- Proactive leasing agreements
- Public agency communication
- Rangeland restoration

Strategies for Short-term Response

- Anticipate forage supply
- Reduce herd size strategically
- Evaluate cost trade-offs of buying hay vs selling cows
- Evaluate alternative feeds
- Respond to Animal Health concerns
- Annual forages
- Create a plan for wildfire emergencies
- Taking advantage of disaster payment programs.

Drought Strategies Crops & Cropping Systems

Introduction

In This Section

Strategies for Long-Term Preparedness

- Reducing water transportation losses
- Irrigation delivery system modification and monitoring
- Augmentation
- Crop selection to reduce water consumptive use
- Improving irrigation infrastructure
- Conservation tillage
- Short-term Storage
- Demand management

Strategies for Short-term Response

- Understanding crop water use and growth stages
- Monitoring crop water use (i.e., evapotranspiration)
- Weed management
- Soil fertility management
- Surge and cutback irrigation
- Flow measurement
- Deficit/Limited irrigation management
- Crop insurance

In This Section

- Financial Risk
- Marketing Risk
- Human Risk
- Legal Risk
 - Tax Implications
 - Estate and Succession Planning
 - Leasing
- Production Risk
 - Partial Budgeting
 - Insurance

Drought Strategies

Risk Management

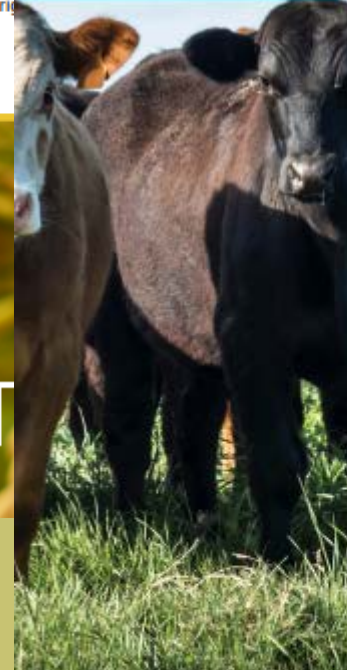
Becoming a resilient producer is imperative for managing drought in an operation for the long-term. Risk management allows a producer to identify, analyze, monitor, and mitigate risks that threaten the objectives identified by the operator. Every business decision and action can be classified within one of the five sources of risk:

1. Financial
2. Marketing
3. Legal
4. Human
5. Production

Managing for risk is being intentionally proactive, not reactive. Mitigating drought risk can be the difference between profit and loss for a farm or ranch.

It's important to be resilient in all five areas of risk, especially when managing drought. The resiliency self-assessment tool developed by the CSU Extension Agriculture and Business Management (ABM) Team (following page) is a set of statements and a self-ranking scale that producers can use to determine where to prioritize their efforts. This tool can help farmers and ranchers absorb and recover from shocks and stresses to their agricultural production and livelihoods.

The following section follows the self-assessment relative to drought. The CSU Extension ABM Team has a dedicated website containing materials to help producers manage for all areas of risk in their operation. Visit <https://abm.extension.colostate.edu> to see more resources relative to risk management.



Drought Handbook

droughtadvisors.org

- Making a Drought Plan
- Climate, Drought & Trigger Dates
 - Weather in CO
 - Critical Periods by Region
 - Using Forecasts & Forecast Accuracy
 - Trigger Dates by Crop and Region
- Drought Strategies
 - Range and Livestock
 - Crops and Cropping Systems
 - Risk Management



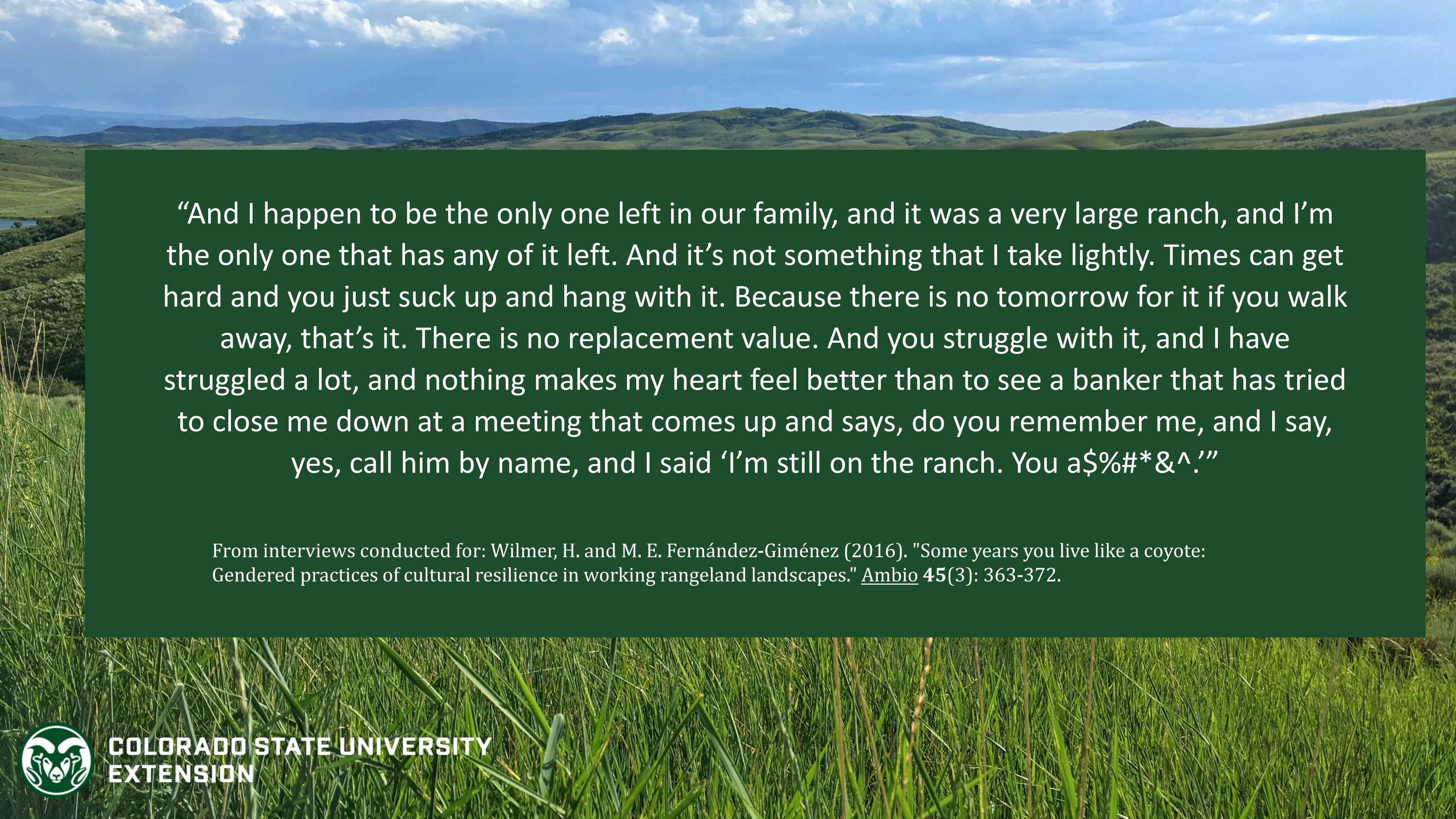
Thank You

Jenny Beiermann, Rachel Belouin, Becky Bolinger, Ansley J. Brown, Nicole Didero, Julie Elliott, Greg Felsen, Micaela Fenton, Madeline Goebel, Tonya Haigh, Tori Kauffman, Emily Lockard, Marcella Tarantino, Brad Tonnessen, Harrison Topp, Alistair Vierod, Lauren Vilen, Christina Welch, Gus Westernman, Karl Wetlaufer, Clinton Wilson, Jill Zarestky

Contact

Retta.bruegger@colostate.edu
970.988.0043





“And I happen to be the only one left in our family, and it was a very large ranch, and I’m the only one that has any of it left. And it’s not something that I take lightly. Times can get hard and you just suck up and hang with it. Because there is no tomorrow for it if you walk away, that’s it. There is no replacement value. And you struggle with it, and I have struggled a lot, and nothing makes my heart feel better than to see a banker that has tried to close me down at a meeting that comes up and says, do you remember me, and I say, yes, call him by name, and I said ‘I’m still on the ranch. You a\$%#*&^.’”

From interviews conducted for: Wilmer, H. and M. E. Fernández-Giménez (2016). "Some years you live like a coyote: Gendered practices of cultural resilience in working rangeland landscapes." *Ambio* 45(3): 363-372.

