Improving Communication and Collaboration Among Diverse Experts

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Welcome!

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Workshop Structure

- Introduction to science communication and collaboration (15 minutes)
  - Why are we here?
- “Message Box” concept (15 minutes)
  - How to present science to non-peers?
- Interview practice (40-45 minutes)
  - Your turn!
- Group discussion (20 minutes)
  - What did we learned?

Why are we here?

- Communicating and collaborating with the public and peers outside our field breaks down academic silos
- Increases our understanding of real-world barriers to adopting science solutions
- Foster formation of diverse teams representing diverse, under-represented, and overlooked perspectives
- Increase the presence, relevance, and acceptance of research results in decision and policy making

Examples

1. Seasonal climate forecasts tailored for wheat farming

   study decision making and forecast needs, then tailor forecasts

2. Rangeland management for multiple objectives (CARM)

   involve diverse stakeholders in research to improve sustainable rangeland management

3. Unsustainable increase in cattle body size

   understanding economic drivers of producing larger cattle despite greater heat stress and lower water and feed efficiency

Examples

Collaboration across disciplines

1. Agronomists, social scientists, meteorologists
2. Rangeland managers, social scientists, ecologists, ranchers
3. Ecologists, climate scientists, ranchers, social scientists

Effective communication is key to successful collaboration….

Present your research in a way that makes sense not to you, but to your audience.

Peer-reviewed paper

1. Abstract
2. Intro
3. Methods
4. Results
5. Discussion
6. Conclusion

~ 4,000 - 8,000 words

Science in the news

1. Main finding(s)
2. Some back story
3. More findings
4. What it means
5. More findings
6. What's next

~ 900 - 1,300 words

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Present your research in a way that makes sense not to you, but to your audience.

Peer-reviewed paper

Ancient West African foragers in the context of African population history

"We infer an Africa-wide phylogeny that features widespread admixture and three prominent radiations, including one that gave rise to at least four major lineages deep in the history of modern humans."

Lipson et al. (2020) in *Nature* 577, 665-670.

Science in the news

Ancient DNA from West Africa Adds to Picture of Humans' Rise

"These ancient genomes contain vital clues to the history of the continent that have largely disappeared in the past few thousand years. Taken together, they are giving scientists a new vision of our species since it arose in Africa."

Carl Zimmer in *The New York Times*, Jan 22, 2020

… but it’s not enough.

Effective communication is not only important to share your research with others without receiving feedback.

Its objective is to assist collaboration, to make science more applicable and scientists more sensitive to the concerns and values of others (Srinivas 2017)

Collaboration Examples

Collaboration Examples

Developing Effective Drought Index for Farmers in the South-Central U.S.

→ evaluate drought index linked to crop yields in the Southern Plains

→ collaboration of Oklahoma researchers and crop producers

Grassland Resilience Working Group (MSU)

+ Grassland Resilience Graduate Group

Results-oriented Grazing for Ecological Resilience (ROGER)

Developing Climate Services in Bangladesh (IRI)

Grand Challenges for Resilience-Based Management of Rangelands

Five Levels of Engagement

Type of Engagement	No Engagement	Communicate	Consult	Collaborate or Co-Develop	Co-Produce
Time Requirement	No extra time required	Little: Single or few engagements	Moderate: Several engagements	Significant: On-going engagement	Intensive: Long-term & on-going engagements
When during the project	No portion of project cycle	End of project	Middle of project	Throughout project	Prior to and beyond project

A How-to Guide for Science Co-Production

Guiding principle #1: Coproduction begins with decisions that need to be made

Collaborate to identify research needs. As scientist, don't assume you know what managers need. As manager, don't assume scientists know how to provide useable answers.

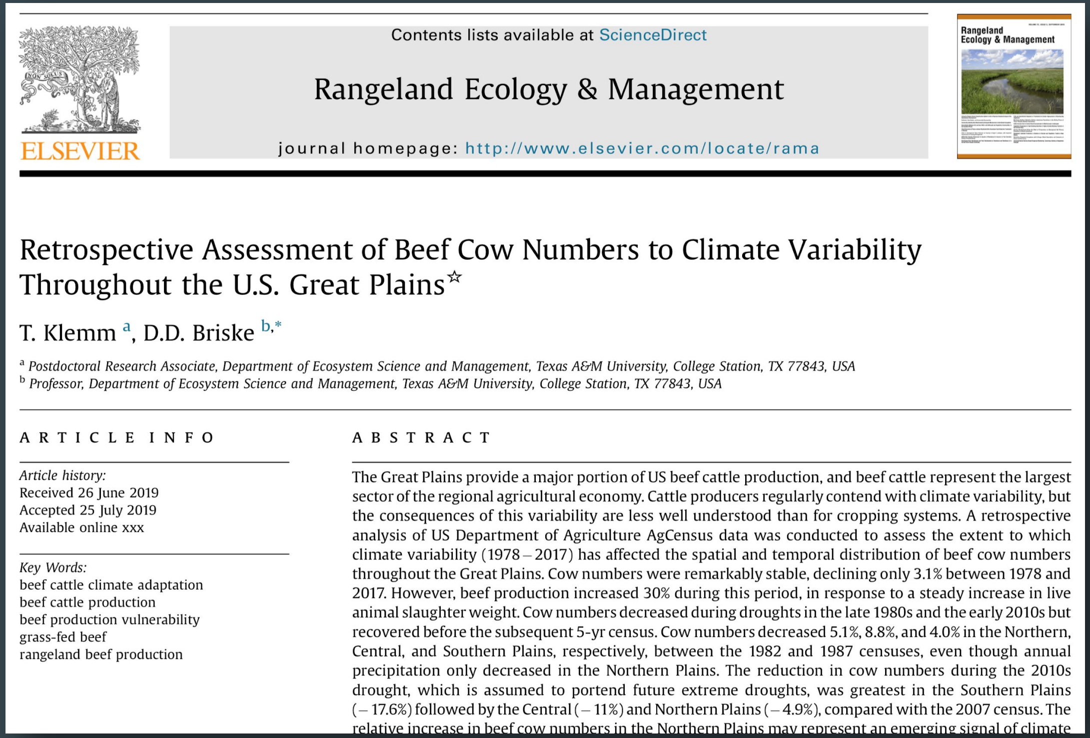
Guiding principle #2: Partners should prioritize process over results

Scientific results don't speak for themselves. They require guidance for proper implementation and use.

Beier et al. (2017): A How-to Guide for Coproduction of Actionable Science. *Conservation Letters* 10(3), 288-296. (open access)

Message Box

Translate this → Into this



Contents lists available at ScienceDirect

Rangeland Ecology & Management

journal homepage: http://www.elsevier.com/locate/rama

ELSEVIER

Retrospective Assessment of Beef Cow Numbers to Climate Variability Throughout the U.S. Great Plains☆

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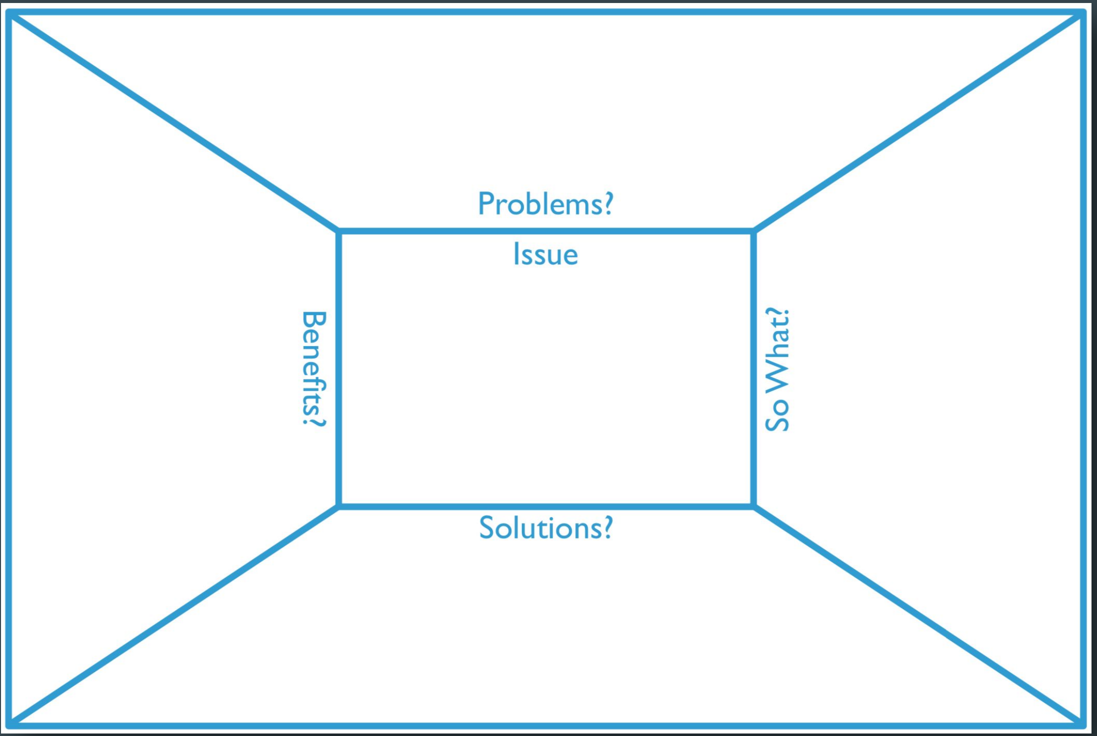
ABSTRACT

The Great Plains provide a major portion of US beef cattle production, and beef cattle represent the largest sector of the regional agricultural economy. Cattle producers regularly contend with climate variability, but the consequences of this variability are less well understood than for cropping systems. A retrospective analysis of US Department of Agriculture AgCensus data was conducted to assess the extent to which climate variability (1978 – 2017) has affected the spatial and temporal distribution of beef cow numbers throughout the Great Plains. Cow numbers were remarkably stable, declining only 3.1% between 1978 and 2017. However, beef production increased 30% during this period, in response to a steady increase in live animal slaughter weight. Cow numbers decreased during droughts in the late 1980s and the early 2010s but recovered before the subsequent 5-yr census. Cow numbers decreased 5.1%, 8.8%, and 4.0% in the Northern, Central, and Southern Plains, respectively, between the 1982 and 1987 censuses, even though annual precipitation only decreased in the Northern Plains. The reduction in cow numbers during the 2010s drought, which is assumed to portend future extreme droughts, was greatest in the Southern Plains (– 17.6%) followed by the Central (– 11%) and Northern Plains (– 4.9%), compared with the 2007 census. The relative increase in beef cow numbers in the Northern Plains may represent an emerging signal of climate



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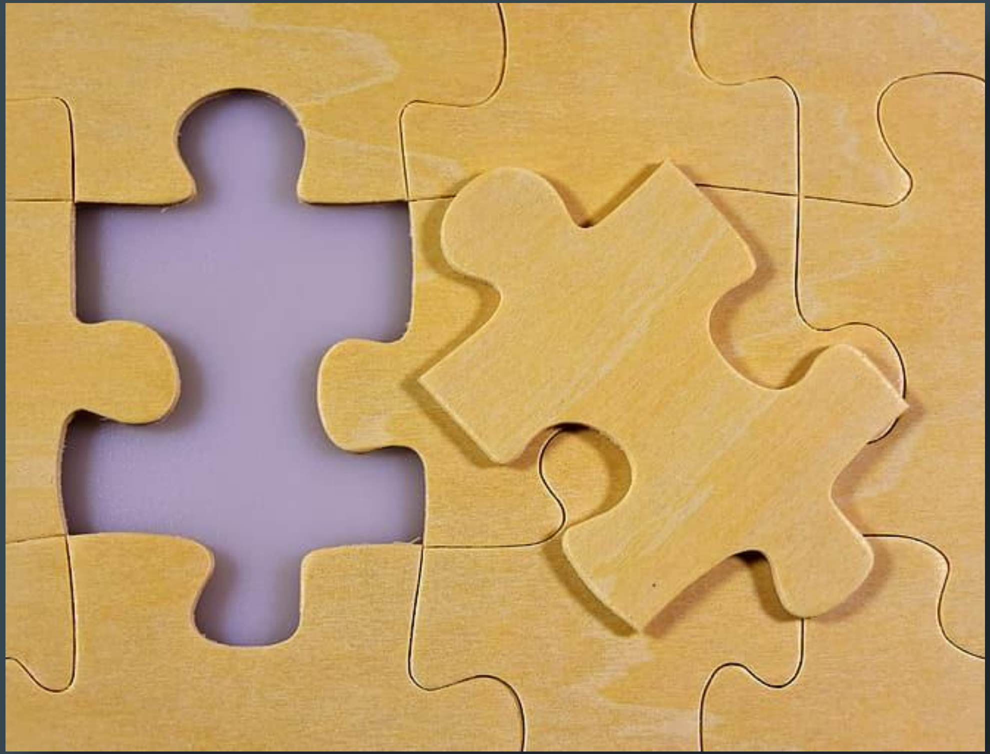
Message Box



Message Box Example

0) Audience

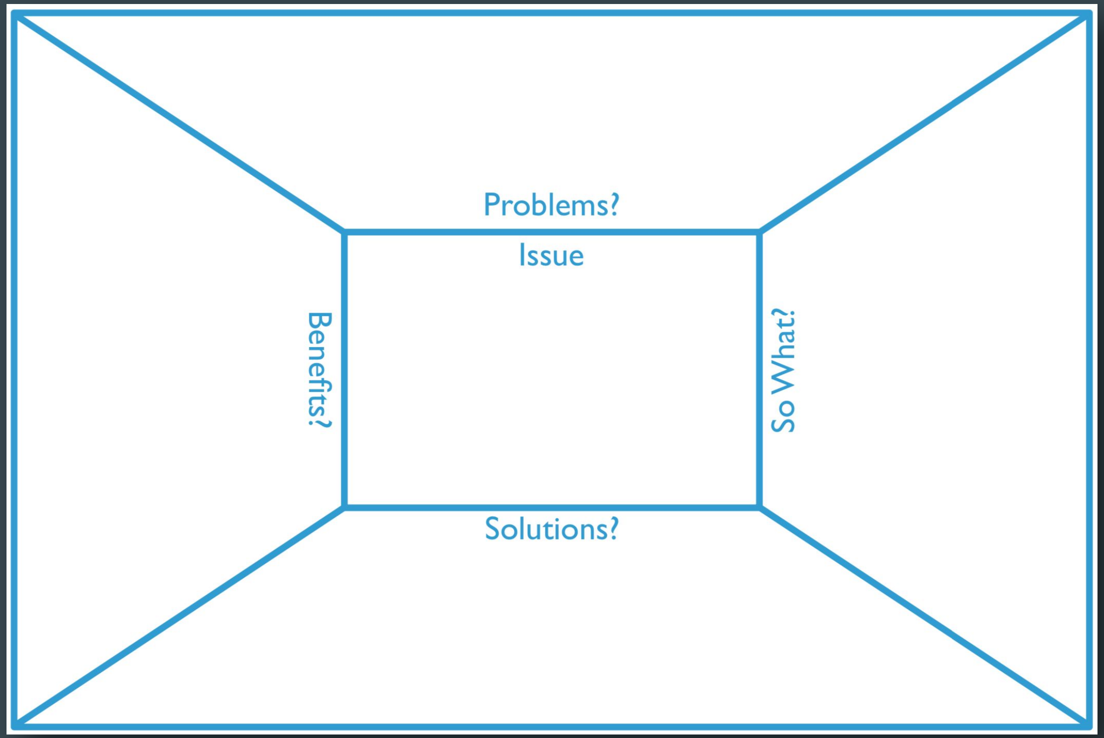
1) Issue

2) Problems?

3) So what?

4) Solutions?

5) Benefits?



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Toni and David's research:
Ecological and Socio-Economic Vulnerability of Beef Cattle Production in the U.S. Great Plains to Climate Variability and Change in the 21st Century

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Message Box Example

0) Audience: State Legislature (Texas)

1) Issue

2) Problems?

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Reducing the economic impacts of extreme droughts on ranching in Texas

Message Box Example

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1) Issue

2) Problems?

3) So what?

4) Solutions?

5) Benefits?

Ranching in Texas is threatened by increasing future droughts. Droughts similar to those in 2011/2012 will occur more often and become more severe in the future due to climate change. Scientific projections show that more frequent droughts will increase the variability of native grasslands, which provide feed for cattle.

Message Box Example

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5) Benefits?

Greater variability in available forage will lead to de-stocking/re-stocking and increased spending for supplemental feed, which created several billion dollars in costs in 2011/2012. It will increase production costs for ranchers, which will make it difficult for them to compete with regions in the U.S. and globally that are less affected by climate change, for example the Northern Great Plains.

Message Box Example

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3) So what?
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5) Benefits?

Research funding should be provided to explore the complexity of ranch decision making, and education standards need to include adaptive management to raise the adaptive capacity and the economic appeal of ranching. State subsidy programs should be evaluated based not only whether they assist managing current crises, but also whether they help efforts to prepare for future extremes.

Message Box Example

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Increasing the economic viability of ranching will reduce tax expenses to cover damages due to extreme droughts. It can strengthen rural economies and secure a traditional Texas lifestyle for future generations, and it can support a major land use and protect natural lands that are home to numerous flora and fauna.

Your turn: Practice! (again and again)

Goal: understand your co-production partner, their expertise, and needs.

- Groups of 3 people
- 1st person asks questions, 2nd person answers, 3rd person observes
- Rotate every five minutes
- In between rotations, take a minute or two to evaluate
- Questions:
    - For managers: Describe your work. How can scientific products help you?
    - For scientists: Describe your work. How can it inform decision making?
    - For managers: Describe a management need, goal, or problem (don't request a product).
    - For scientists: Make sure you understand the decision environment before suggesting specific products.
    - For managers: How do you incorporate risk in your decision making?
    - For scientists: How do you convey uncertainty in your results?

Discussion - What did you learn?

What are your thoughts?

What did you learn from this exercise?

Introduction

- Examples of good communication leading to successful collaboration HERE

The “Message Box” concept