Synthesizing Great Plains Social Science:
Interdisciplinary Solutions and Responses to Climate Change for Grassland Managers in North Central USA

Sarah Gonzalez Coffin
RCAP Summer Research Symposium
August 3, 2023
Today's Talk

- Project Overview
- Key Findings
- Applications
- Next Steps
- Q&A Session

Nobody:
Me: A social scientist, ranting about the importance of interdisciplinary climate adaptation & mitigation research
Project Goals

- **Synthesize** social science research for the Great Plains

- **Identify Knowledge Gaps** where future research should be directed

- **Review Solutions** and describe how social science insights can be applied to tackle grassland management challenges. Includes solutions from:
  - Community-based research
  - Researchers
  - Practitioners

*Grassland Ecoregions in the North Central Region*

(Colorado, Kansas, Montana, Nebraska, North Dakota, South Dakota, Wyoming)

- **Ecoregions**
  - Tallgrass
  - Northern Mixed Grass
  - Central Mixed Grass
  - Shortgrass
  - Sagebrush-Grassland Ecotone
  - Other

- **Percent Sagebrush Cover**
  - >0% - 4.99%
  - 5% - 14.99%
  - 15% - 29.99%
  - 30% - 49.99%
  - 50% - 85%

(Miller Hesed & Yocum, 2023)
Ecological Synthesis Identified 15 Information Needs

Direct Threats
Where are grasslands most likely to be lost to other land uses?

How can conservation on private grasslands be achieved?

Contributing Factors
What legal and policy changes can support grassland resilience to climate change?

What novel ways of thinking are needed to successfully manage grasslands amidst climate change?

Disciplines
Anthropology
Communications
Economics
Education
Poly-Sci
Psychology
Sociology
Stakeholders

- Corporations
- Farmers
- Federal resource managers
- General Public
- Indigenous/Tribal members
- Landowners
- NGO staff
- Pastoralists
- Political Leaders (Mayors, District Court Judges)
- Ranchers
- State resource managers
- Other: Academic or Subject Matter Experts, Conservation Advocates, Recreationists
Social & Ecological Dimensions of Climate Change Adaptation & Mitigation

(Adgar, 2006; Bentley Brymer et al., 2020; Gosnell et al., 2020; Grimberg et al., 2018; Romsdahl et al., 2019; Sanderson et al., 2018; White & Selfa, 2013; Wilcox et al., 2018)
Theme #1: Socio-cultural factors related to adaptation and mitigation

Challenges
- Amenity migration (Abrams et al., 2012)
- Financial sustainability for smaller & intergenerational farmers (Hurst et al., 2017)
- Urbanization (Archer & Lonsdale, 2003)

Cultural Effects
- Misunderstandings between stakeholders
- Challenges to information sourcing and spread [through trusted networks]
- Political disenfranchisement and concerns with representation
- Transition of land use from production (e.g., farming) to recreation & protection
- Loss of [some] local culture
Theme #2: Economics

**Economic Vulnerability**

- **Vulnerability gap** – when optimal well-being is below threshold needed to respond to risks (Adger, 2006)

- In many studies, participants had high risk perceptions related to ecological impacts of climate change & their ability to economically bolster against those risks (Hanberry et al., 2019)

- For farmers in particular, reliable income has been a challenge and is being supplemented by other activities, such as hunting.
Theme #3: Political & Governance Factors

- **Communication to Citizens.** Mayors in the Great Plains ($N = 232$) who had more positive attitudes towards climate change were more likely to frame climate change adaptation and mitigation strategies as a response to climate change (Romsdahl et al., 2019).

- **Public Concern.** Communication that clearly linked climate change to local response efforts was also higher in towns were citizens were more concerned about climate change (Romsdahl et al., 2019).

- **Land Boundaries.** In Montana, ranchers argued that landowners should have control of their own private properties without government interference on boundaries AND should be able to decide on their own when those boundaries should be blurred to accommodate community goods, like hunting (Yung & Belsky, 2007).

- **Legal Liability.** Prescribed burns can be deterred by liability concerns. In Texas and Oklahoma, District Court judges were surveyed on their attitudes and rulings for prescribed burning. Findings were favorable and judges were more willing to offer simple liability rulings for prescribed burns, over gross negligence (Hinojosa et al., 2020).
Theme #4: Broad Solutions & Recommendations

- **Interventions and support to grassland stakeholders will be most effective if they are:**
  - Context-specific
  - Conducted at the local level
  - Acknowledge/emphasize the role of community leaders in setting norms, shaping attitudes, and sharing information

- **Some ways of approaching this might include:**
Theme #4: Broad Solutions & Recommendations

• **Interventions and support to grassland stakeholders will be most effective if they are:**
  - Context-specific
  - Conducted at the local level
  - Acknowledge/emphasize the role of community leaders in setting norms, shaping attitudes, and sharing information

• **Some ways of approaching this might include:**
  - Integrating more community-based research into existing efforts (e.g., existing research findings, ongoing participatory research from the start)
  - Identifying leaders in communities to work with
  - Working at multiple levels of change through avenues such as conservation districts, which are structured at the national, state, district, and county levels
  - Continue to provide stakeholders with information-sharing tools, like the Climate Tool Box, in addition to other efforts

• **Looking forward, we need to:**
  - Broaden research across demographic groups that are underrepresented in both these spaces and the literature itself (e.g., Indigenous knowledge, Latine landowners and workers, women and non-binary farmers/rangers, younger farmers/ranchers)
Next Steps

- Initiative on Climate Adaptation Research and Understanding through the Social Sciences (ICARUS) Conference (September 2023)
- NC CASC 2-pager (August 2023)
- Journal Special Issue (Nov-Dec 2023)
Applications

- **Grassland Managers**: Implement social science strategies into management practices
- **Political Leaders**: Adapt community-based solutions, add behavioral & structural approaches to ongoing efforts
- **Community Leaders**: Social norms & information sharing
  - Grassroots political efforts
- **Researchers**: Fill gaps in literature
  - Collaborate across disciplines
Thank you! Questions?