

Understanding Farmer Perspectives on Climate Change to Inform Engagement Strategies for Adaptation (and Mitigation?)

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World Café: Food, Energy and Water in the Corn Belt
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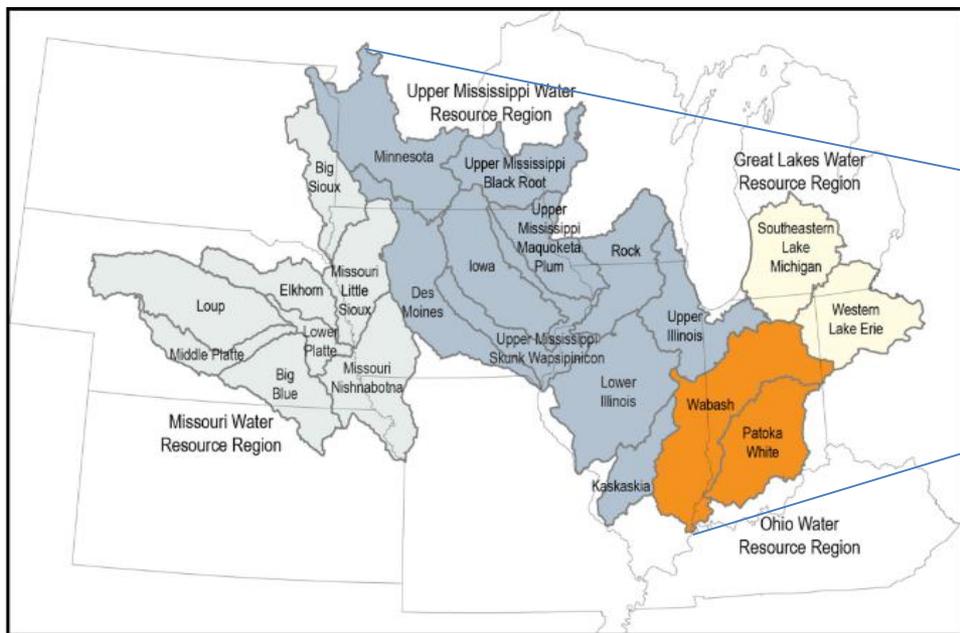
CSCAP social science research on farmers and climate change

- Need to work with farmers to support adaptation and mitigation, but knew little about their perspectives on climate change
- Beliefs ➡ Attitudes, Risk Perceptions ➡ Behavior change
 - What do farmers believe about climate change?
 - Are they concerned about increasing weather variability?
 - Do they support action?
 - Do farmers think they should change the way they farm?
 - Do they think that universities, farm groups, and gov't agencies should help?

Research Methods

1. Survey of farmers from across the Corn Belt
2. In-depth interviews with farmers across the region

Farmer survey



Survey details:

- Partnership with USDA NIFA-funded Useful to Usable (U2U) project, Linda Prokopy
- Larger-scale farmers: \$100k+ Gross Revenue, ~80% of farmland in region
- Sample stratified by 22 HUC6 Corn Belt watersheds
 - Representing ~60% of U.S. corn production
 - USDA NASS conducted survey in February 2012
- Surveyed 4,778 farmers



United States Department of Agriculture
National Institute of Food and Agriculture



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Survey results: Climate change beliefs

“Please select the statement that best reflects your beliefs about climate change”

Climate change is occurring, and it is caused mostly by human activities	8%
Climate change is occurring, and it is caused more or less equally by natural changes in the environment and human activities	33%
Climate change is occurring, and it is caused mostly by natural changes in the environment	25%
There is not sufficient evidence to know with certainty whether climate change is occurring or not	31%
Climate change is not occurring	4%

Most farmers believe climate change is happening, but a minority believe that it is due to human activity

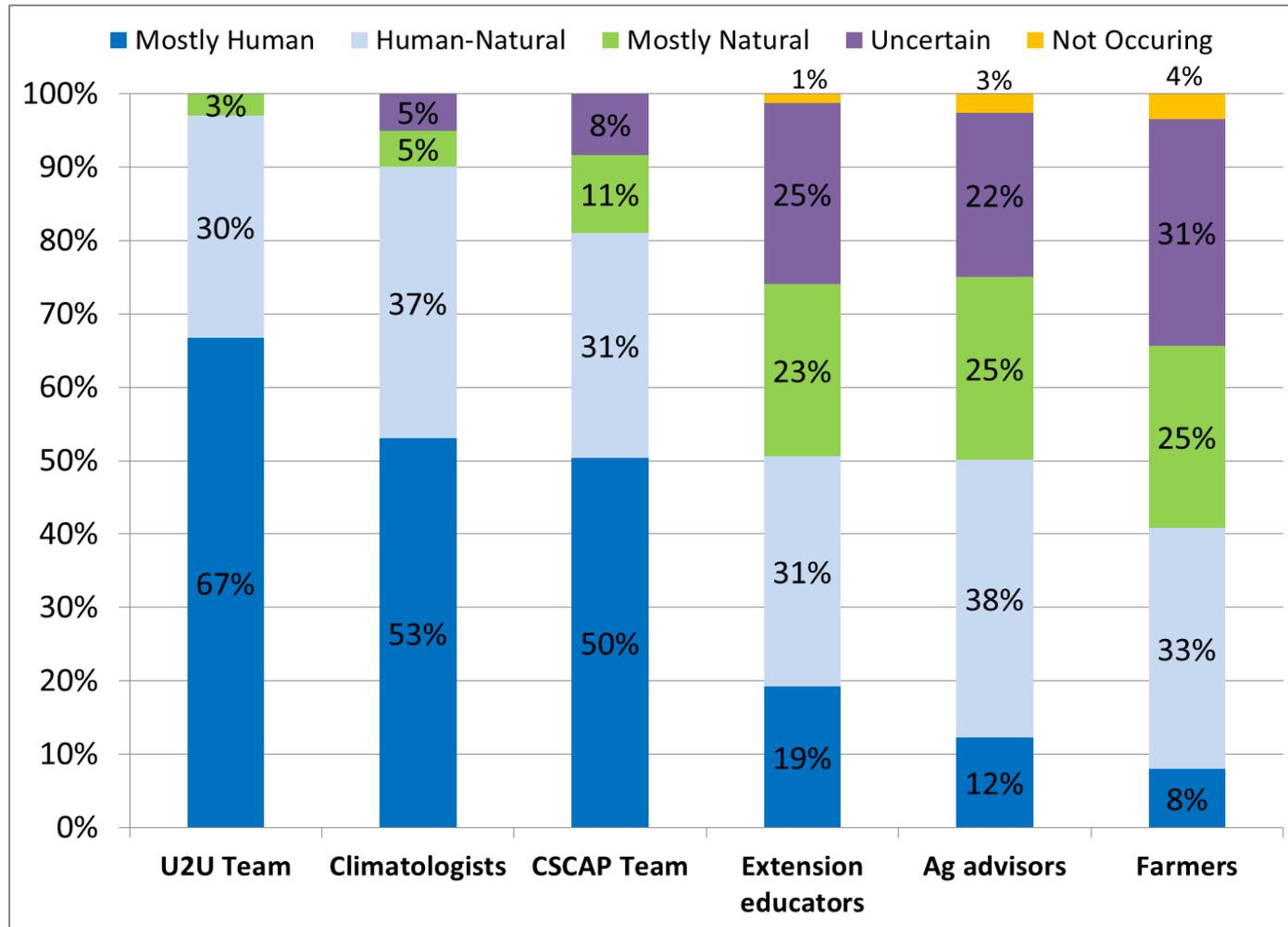
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Climate change is occurring 66%

➤ **Humans are at least partly responsible 41%**

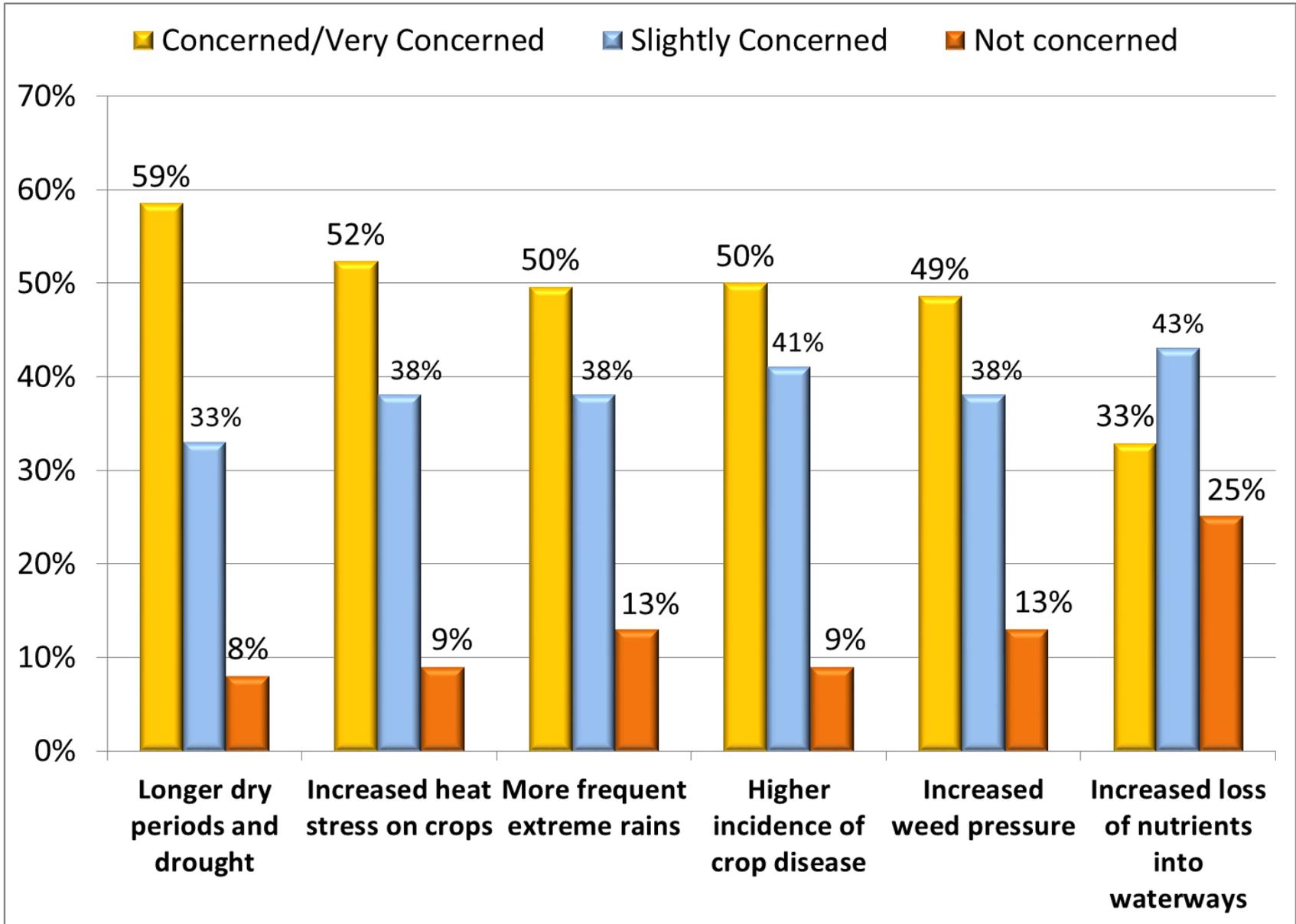
Climate change beliefs vary by group

Farmers and advisers (including extension field staff) are closer to one another than to faculty, scientists

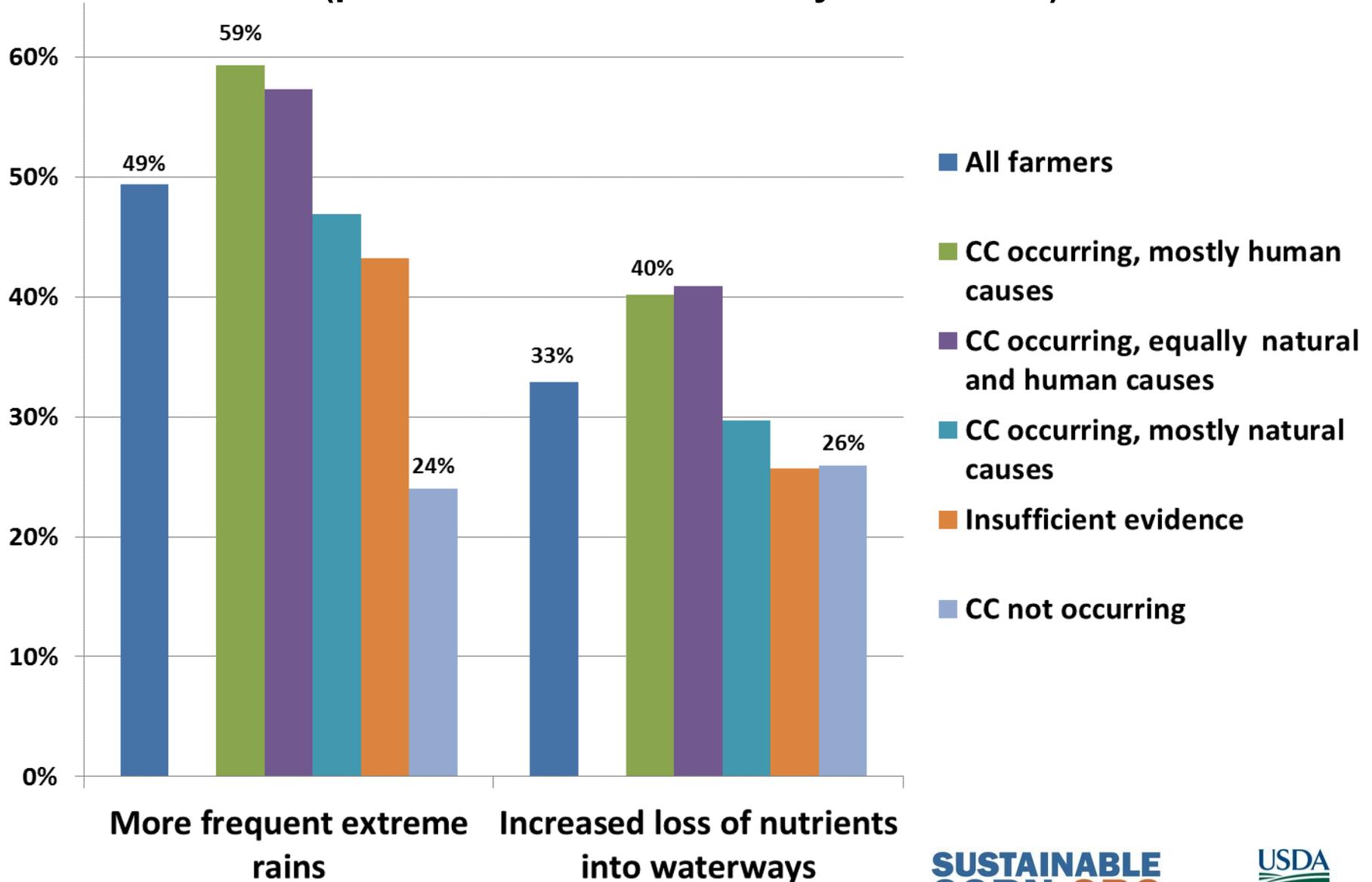


From Prokopy, L.S. L.W. Morton, J.G. Arbuckle, A.S. Mase, and A. Wilke. 2015. Agricultural stakeholder views on climate change: Implications for conducting research and outreach. *Bulletin of the American Meteorological Society*. 96:181-190.

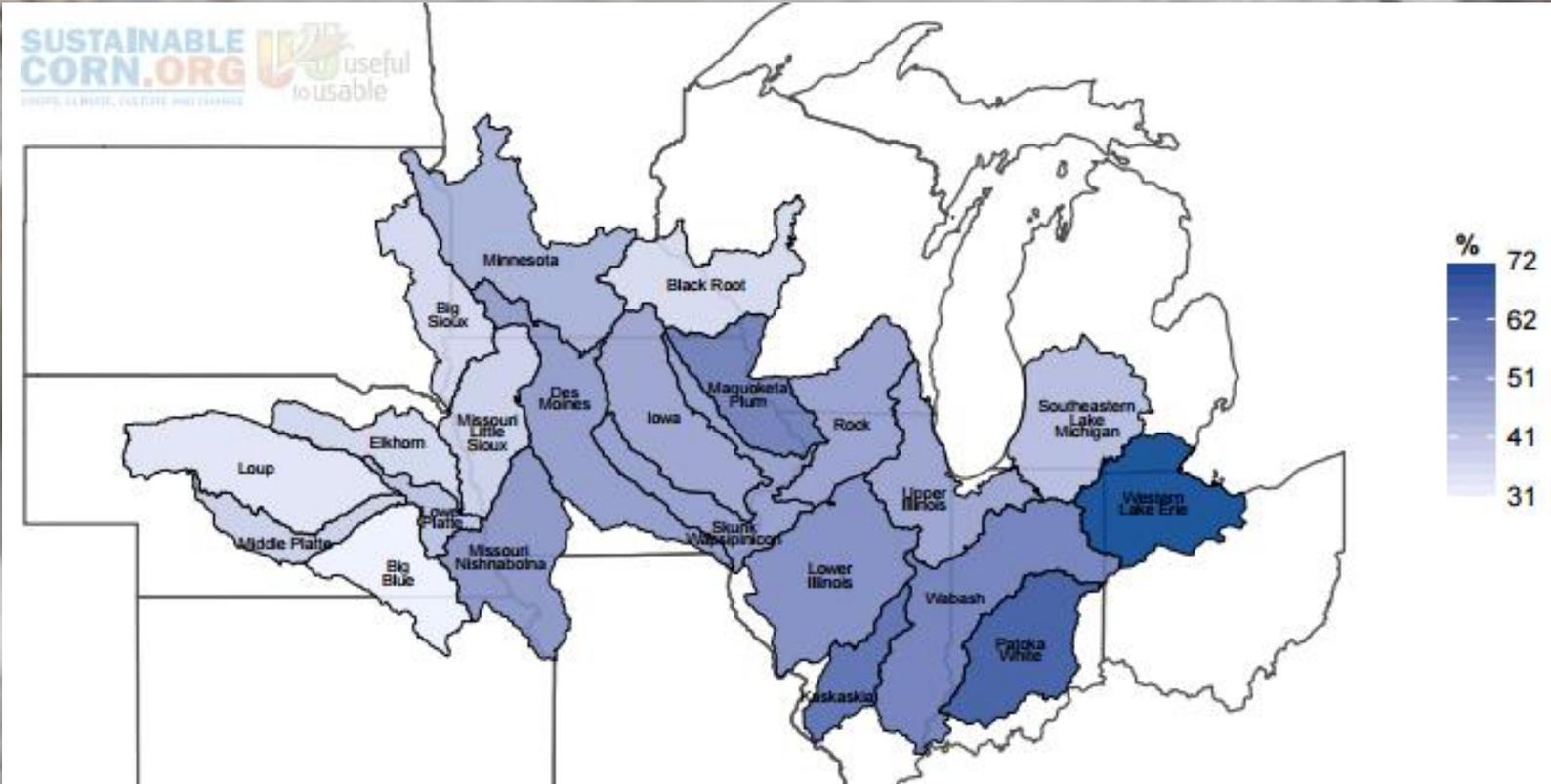
Perceived risks are antecedents to action: Farmers are concerned about future weather and pest problems



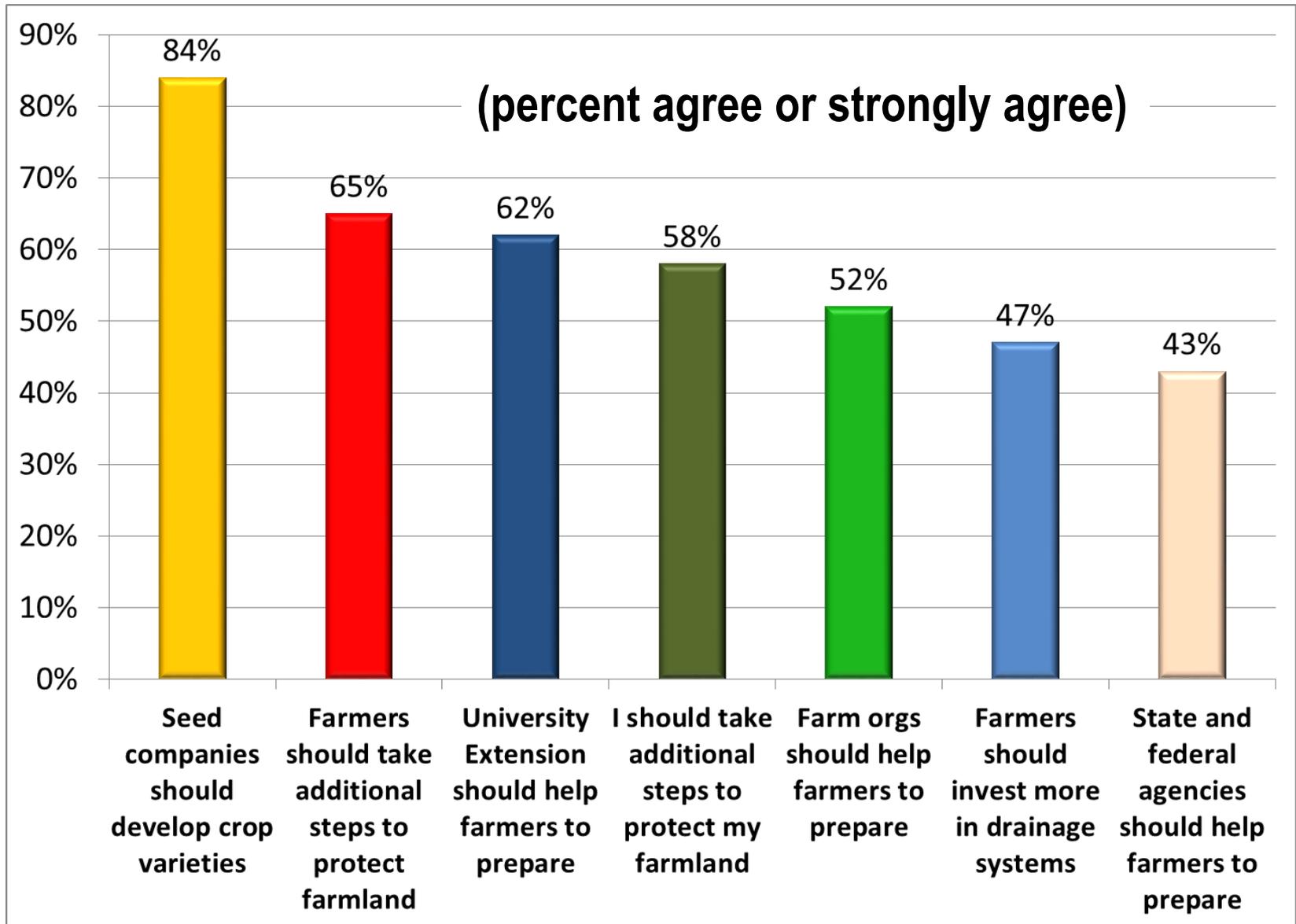
Climate concerns vary by beliefs: Excess water issues (percent concerned or very concerned)



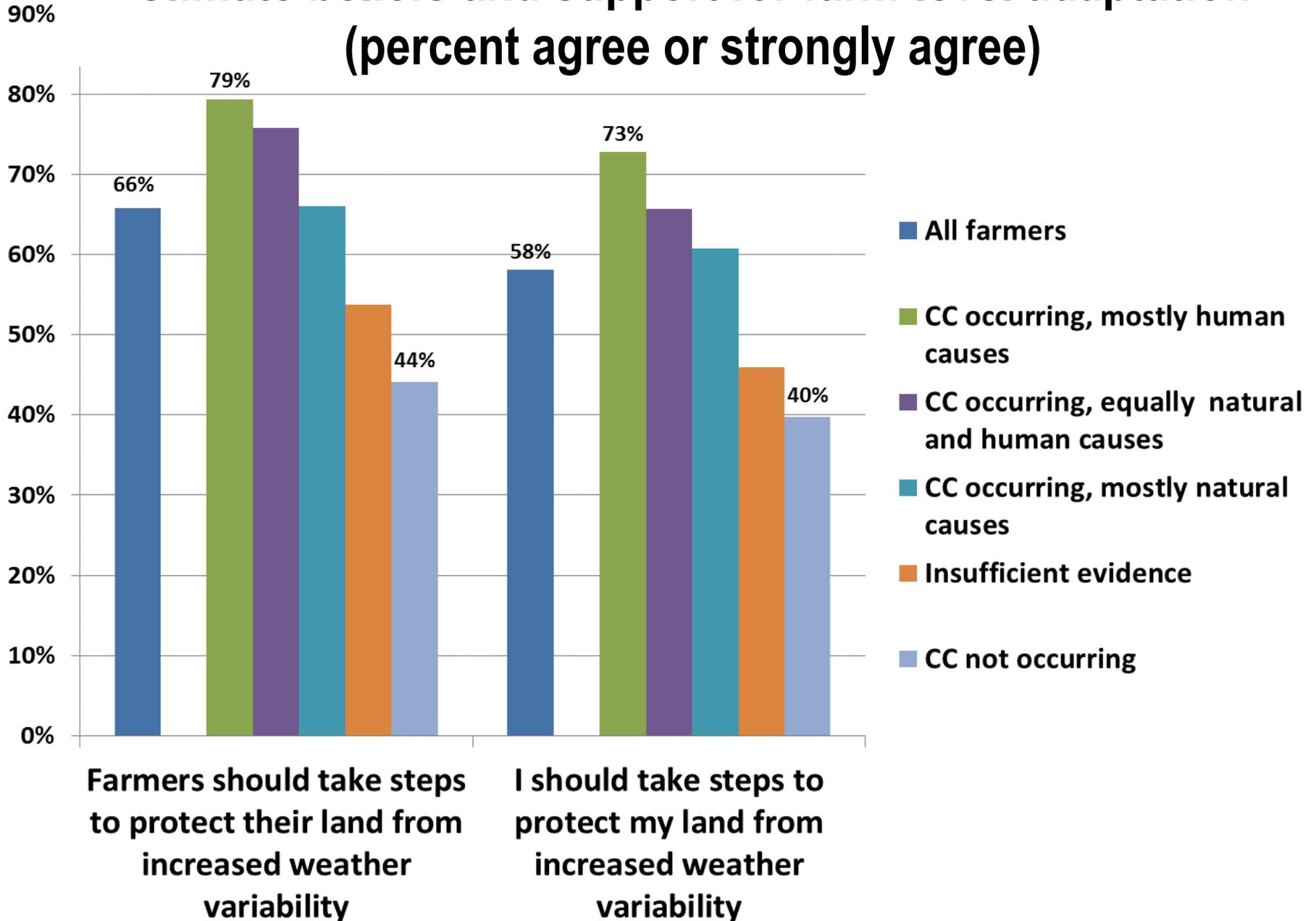
Climate concerns vary across region: More frequent extreme rain events (percent concerned or very concerned)



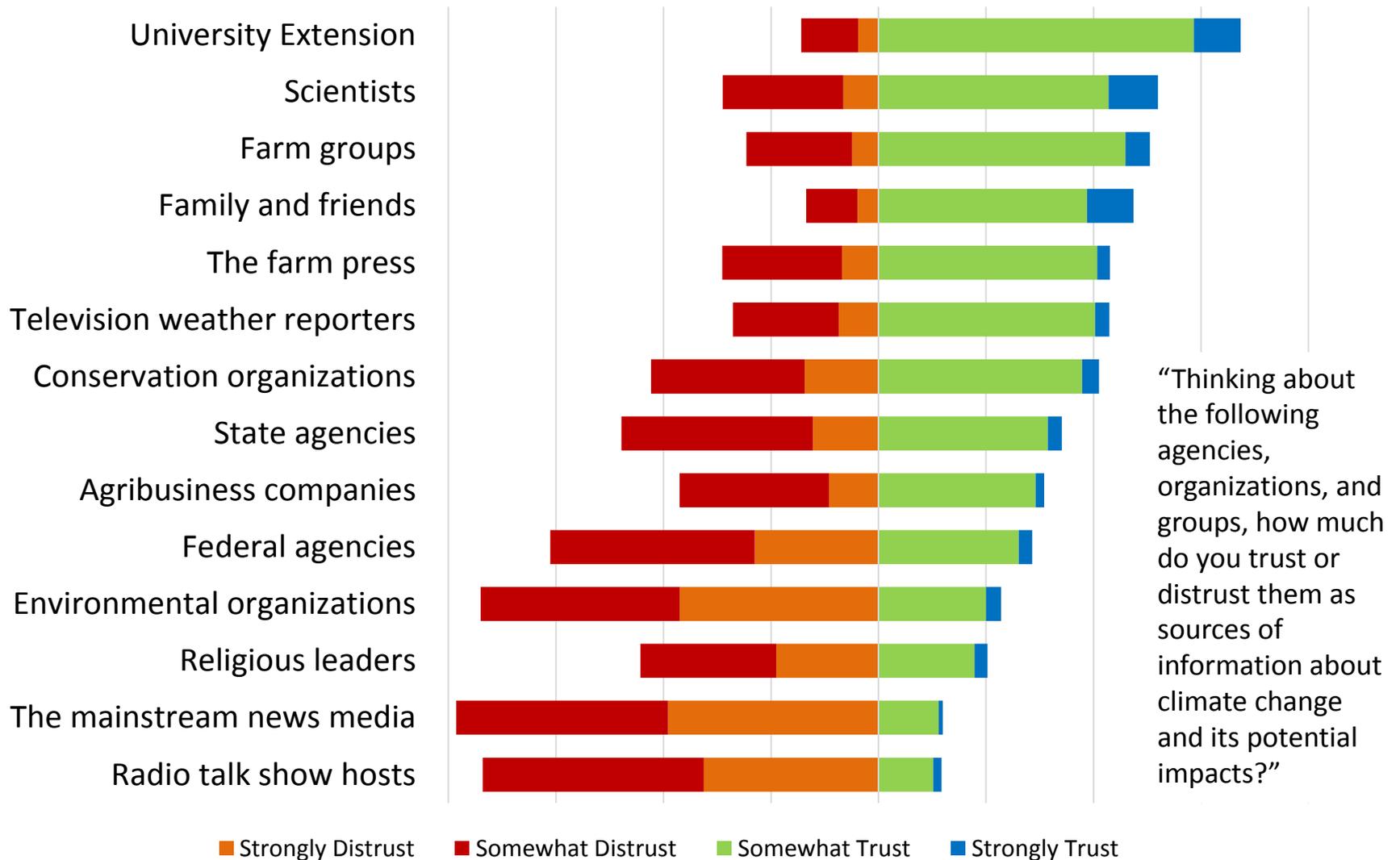
Farmers support action to prepare for “increased weather variability”



Climate beliefs and support for farm-level adaptation (percent agree or strongly agree)



Farmers trust Extension for climate change information



What have we learned from farmers?

- **Farmers are diverse in their perspectives on climate change and what should be done**
- **Most farmers (66%) believed that climate change is happening**
- **Majority of farmers (60%) did not believe that human activity is contributing substantially to climate change**
 - **Recommendation:** Because climate change is a politicized issue, direct, in-person outreach to farmers about adaptation (e.g., in meetings and workshops) may be more effective if terms such as “increased weather variability” and “extreme weather” are used instead of “climate change.” A direct focus on anthropogenic climate change could alienate some farmer audiences.
 - **Many adaptation practices and strategies (e.g., no-till, cover crops) can reduce GHG emissions, so focus on the adaptation side**

What else have we learned from farmers?

- **Many farmers are concerned about predicted climate change-related threats to Corn Belt agriculture, support adaptive action, but lots of spatial variation**
 - **Recommendation:** Because farmers' beliefs, concerns, confidence, attitudes, and practices vary across the Corn Belt, engagement strategies should align with local conditions and contexts and account for differences in farmer perspectives
 - **Recommendation:** Private and public sector stakeholders should step up efforts to raise awareness and adoption of appropriate adaptive (and mitigative) practices: Focus on risk management, solutions

What else have we learned from farmers?

- **Farmers and advisers trust Extension and universities for information on climate change and adapting to increasingly variable weather**
 - **Recommendation:** Extension should embrace its role as the most trusted provider of information about climate change and dealing with extreme weather, and ramp up programming for both farmers and advisers. Extension is uniquely positioned to help improve resilience of agricultural systems
- **However, Extension field staff (and private sector advisers) tend to have belief structures that are similar to farmers**
 - It is difficult for Extension educators to engage in discussion of climate change
 - **Recommendation:** Develop strategies to help extension and private sector agricultural advisers to incorporate the science on climate change, especially adaptation, into programming
 - We found that Extension educators who conducted interviews became much more comfortable with climate change discussion
 - Administrative leadership can provide cover (e.g., Sec. Vilsack USDA policy)

Closing thoughts

- Important for administrators and leaders (university, agency) to prioritize integration of climate science and the science of adaptation and resilience into extension and outreach
- Very important to understand groups that we want to engage: Where do they stand on issues?
 - Social science research can guide actions
 - Suggest pathways for engagement that do not polarize

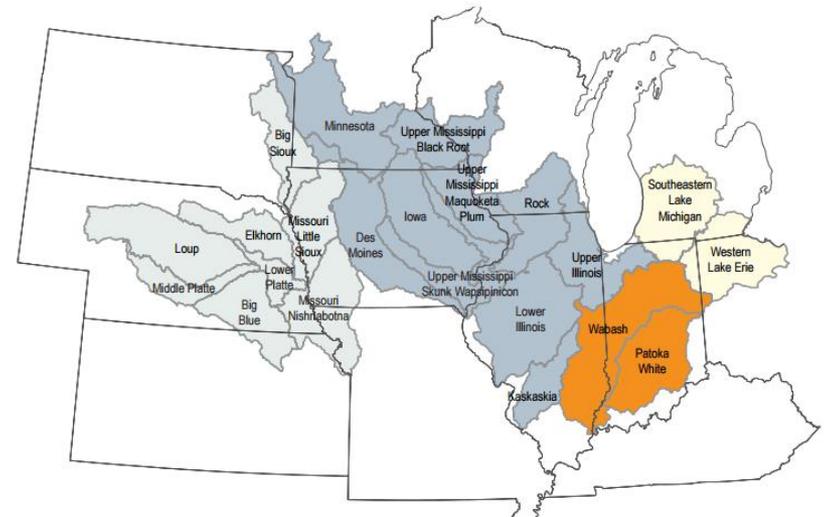
More information and survey results

<http://www.sustainablecorn.org>

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Farmer Perspectives on Agriculture and Weather Variability in the Corn Belt: A Statistical Atlas, Volume 1



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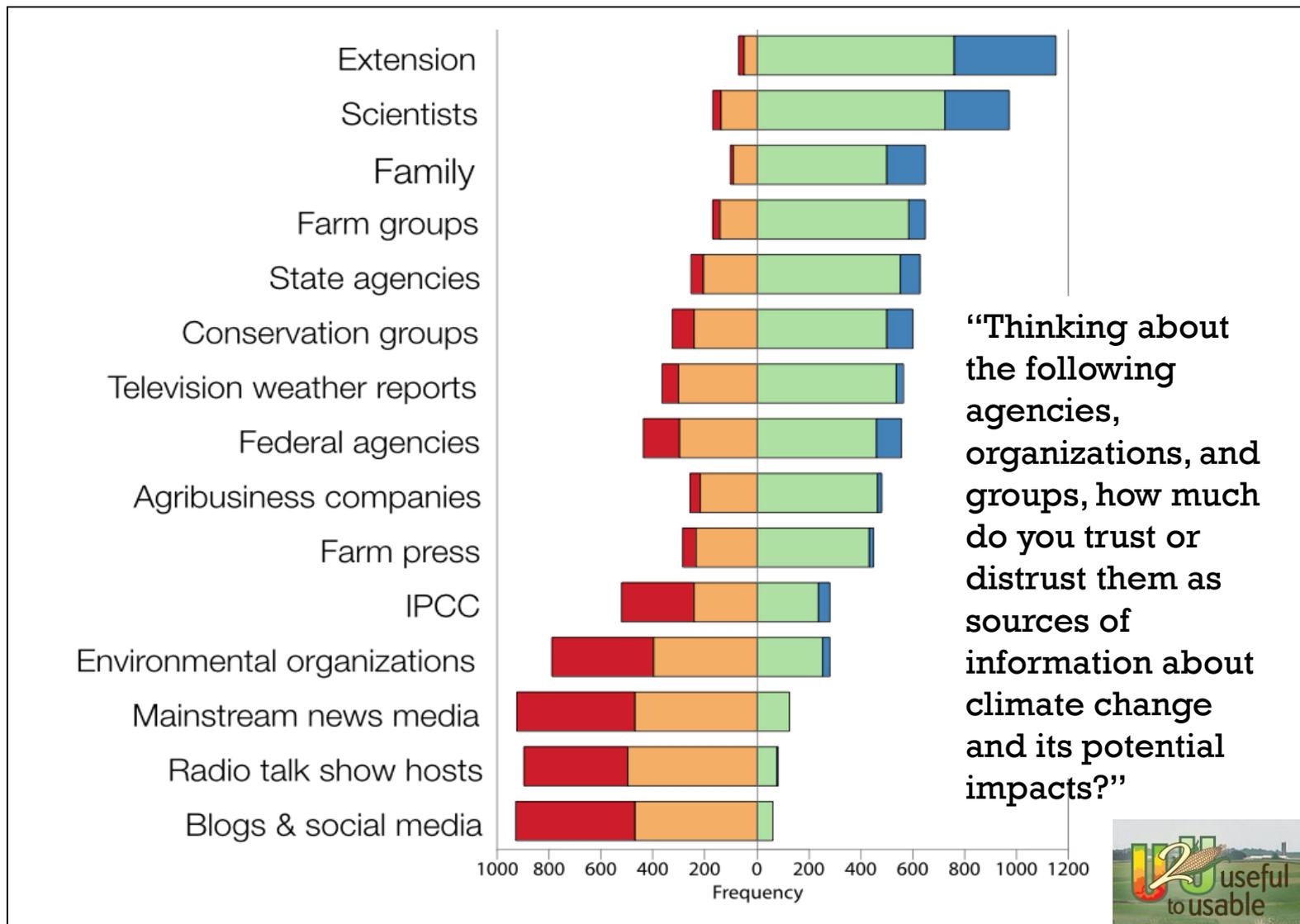
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Thank you!

Photo by A. MacDonald. Info on prairie buffer strips available at:
<http://www.nrem.iastate.edu/research/STRIPs/index.php>

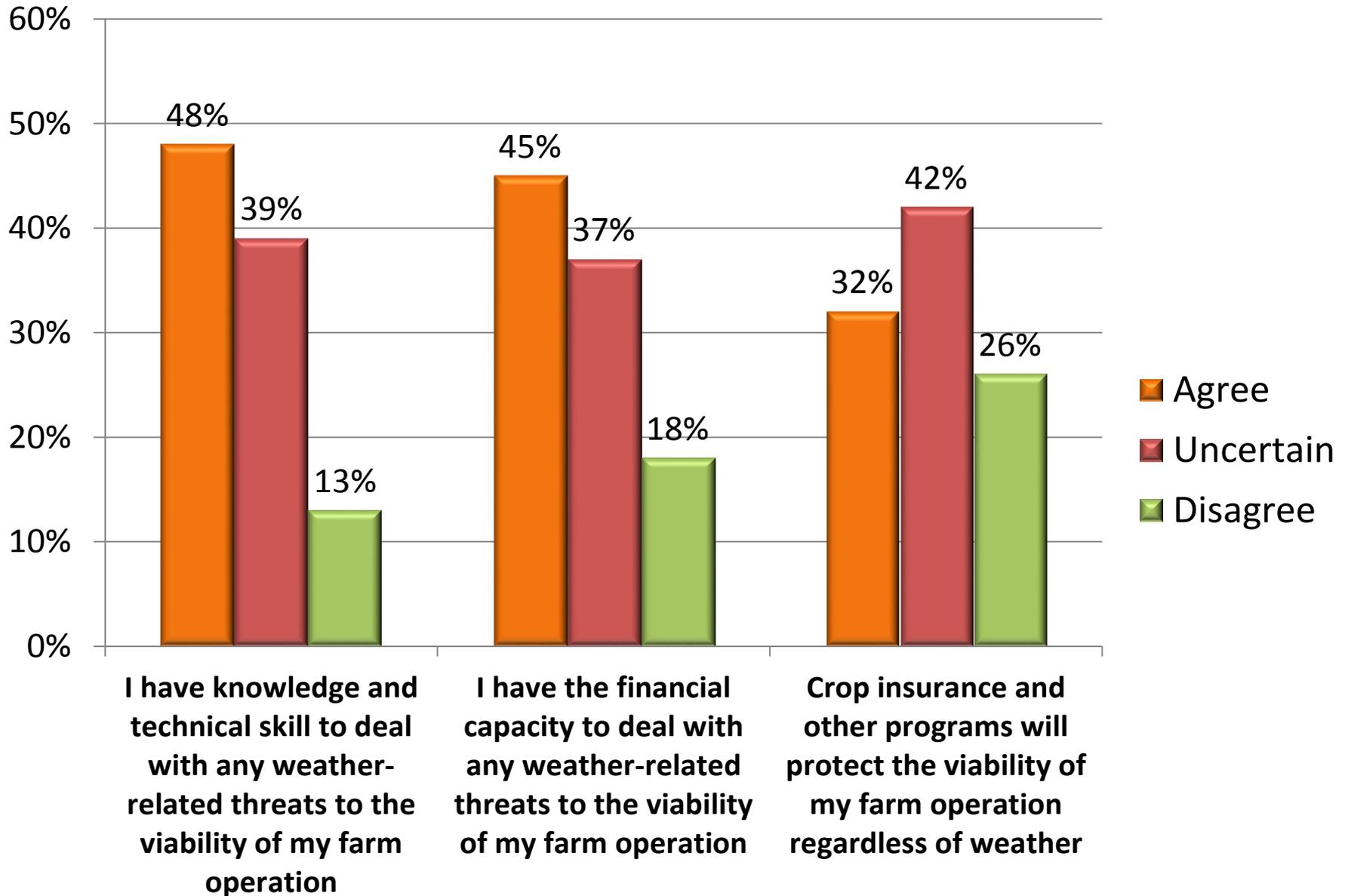
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Cropping Systems Coordinated Agricultural Project: Climate Change, Mitigation, and Adaptation in Corn-based Cropping Systems
Project Web site: sustainablecorn.org

Corn Belt Ag Advisers: Trust in Sources of Climate Change Information



From Prokopy, L.S., J.S. Carlton; J.G. Arbuckle; T. Haigh; M.C. Lemos; A.S. Mase; N. Babin; M. Dunn; J. Andresen; J. Angel; C. Hart; R. Power. Extension's Role in Disseminating Information about Climate Change to Agricultural Stakeholders in the United States. Forthcoming. *Climatic Change*.

Self-efficacy: Confidence in capacity to adapt (percent agree or strongly agree)



Confidence varied by climate beliefs (percent agree or strongly agree)

