United States Department of Agriculture
National Institute of Food and Agriculture

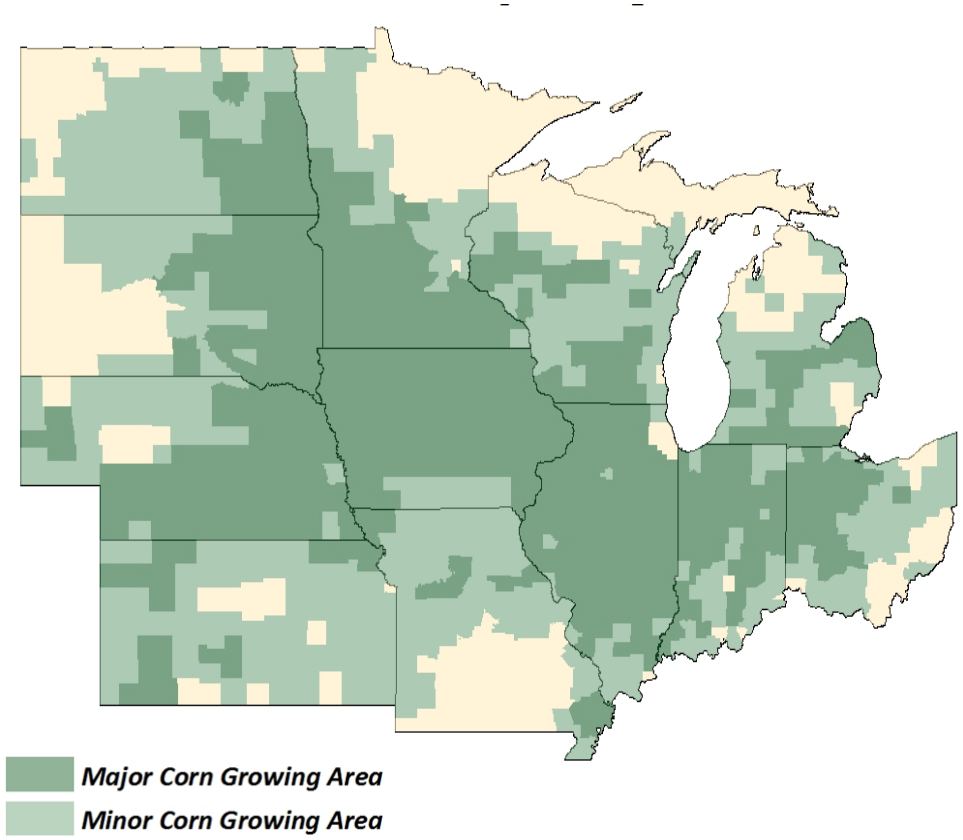
Useful to Usable: Lessons Learned about Selling Conservation

Linda Prokopy
U2U Project Director
Associate Professor, Purdue University

useful to usable

Transforming Climate Variability and Change Information for Cereal Crop Producers

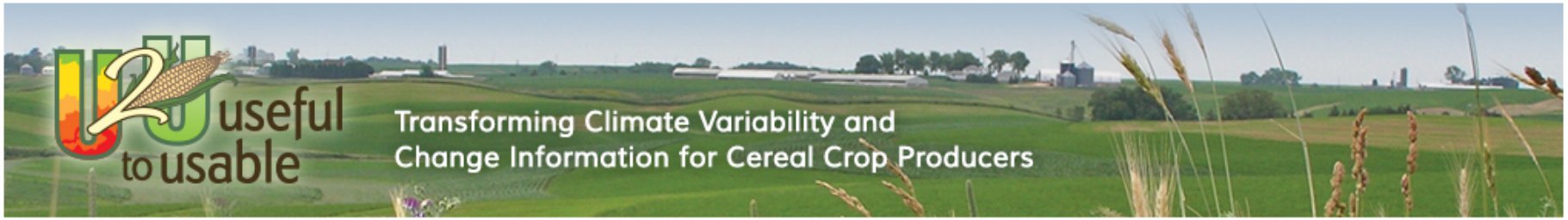
About U2U



Our Vision

- Transform existing climate information into usable knowledge for agricultural decision making
- Give farmers the resources and training to more effectively manage variable climate conditions
- Increase Extension capacity to address agro-climate issues

More **resilient** and **profitable** farms in a variable and changing climate



U2U Team

climatologists, crop modelers, agronomists,
IT specialists, economists, sociologists, Extension, and more

PURDUE UNIVERSITY

IOWA STATE UNIVERSITY OF SCIENCE AND TECHNOLOGY

MICHIGAN STATE UNIVERSITY

ILLINOIS

SDSU

MICHIGAN

MU

University of Nebraska Lincoln

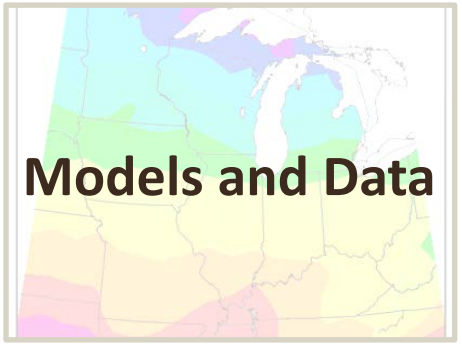
UW Extension Cooperative Extension

High Plains Regional Climate Center

MRCC Midwestern Regional Climate Center

National Drought Mitigation Center

Project Objectives



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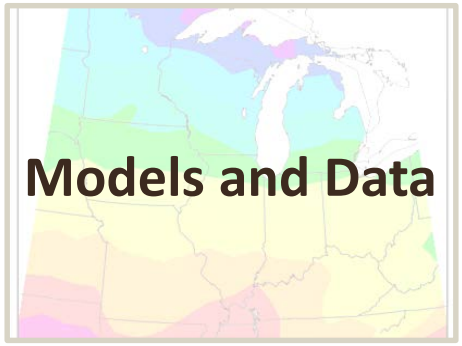
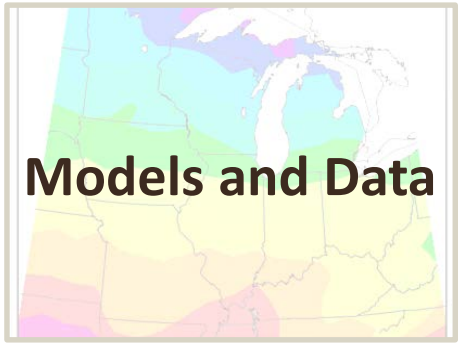


Decision Support Tools

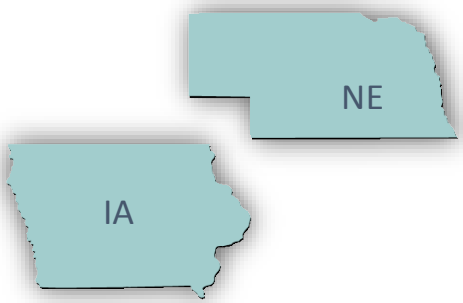
Project Objectives

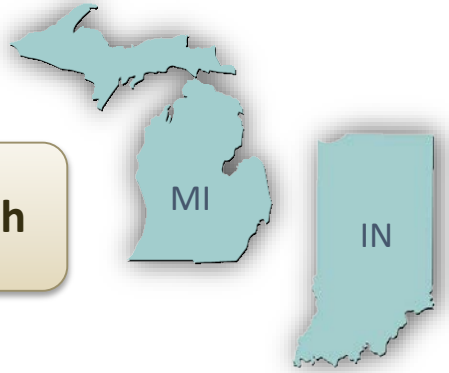


Models and Data

Decision Support Tools

Stakeholder Input





Pilot test tools, methods, and outreach

Disseminate across 12 state region

- There is no shortage of data/models!

- Past research and experience shows existing products are underutilized, not meeting farmers'/advisors' needs

- <u>Guiding principle:</u> work with stakeholders to ensure we are developing usable information that *actually gets used*!

Today's Webinar

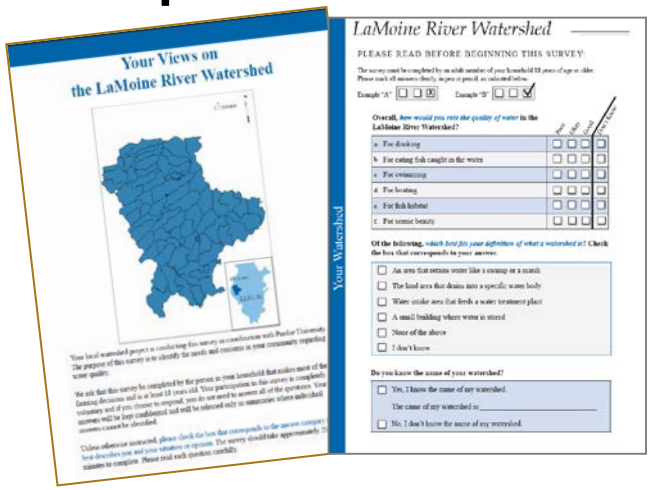
- Review research on farmer adoption of behavior
- How U2U is using social science research to improve decision support tool design, uptake and evaluation

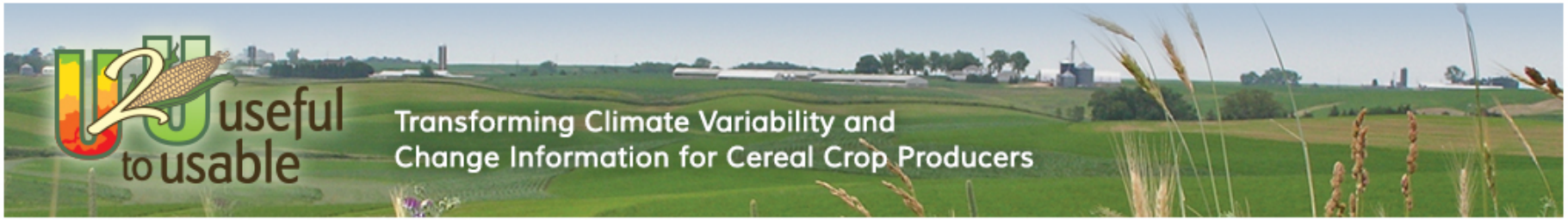
Natural Resource Social Science Lab at Purdue

- Surveys
- Interviews
- Literature reviews
- Focus groups

Surveys

- Quantitative, statistically analyzable data
- Usually random sample of population
- Careful design of questions and pre-testing
- Various modes of delivery

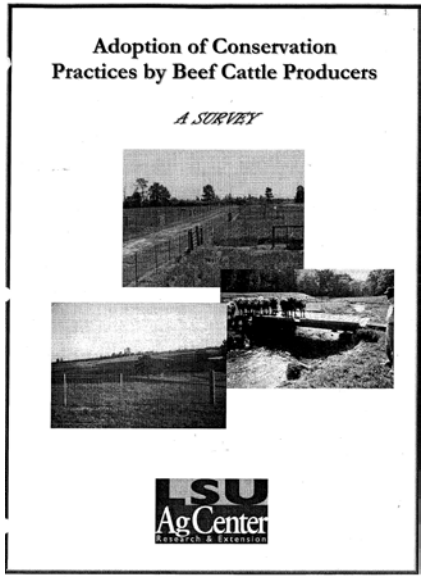


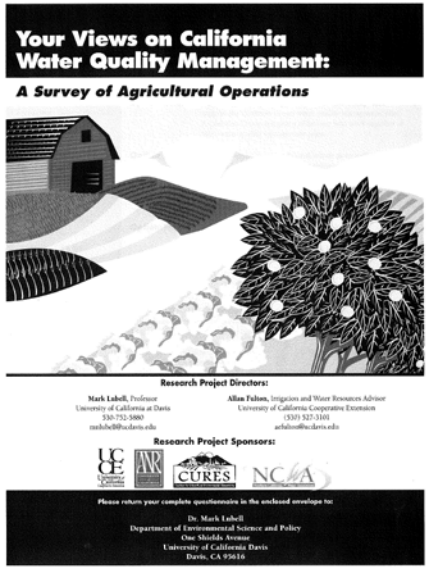


Interviews and Focus Groups

- Qualitative, help answer *why* questions
- Usually purposive sample – not generalizable
- Careful design of questions and pre-testing
- Goal = saturation
- Coding of data – usually grounded theory

1982-2007: 55 U.S. Studies looked at BMP adoption





Meta-analysis results published in Prokopy et al., 2008, *Journal of Soil and Water Conservation* and Baumgart-Getz, Prokopy, Floress, 2012, *Journal of Environmental Management*.

1982-2007: 55 U.S. Studies

- Overall Finding:
  - Very few generalizable trends

1982-2007: 55 U.S. Studies

- Overall Finding:
  - Very few generalizable trends

- However →

Age

1982-2007: 55 U.S. Studies

- Overall Finding:
  - Very few generalizable trends

- However → Farm size

1982-2007: 55 U.S. Studies

- Overall Finding:
  - Very few generalizable trends

- However → Environmental attitudes

Attitudes

Three types of farmers:

- motivated by farm as business
- motivated by stewardship concerns
- motivated by off-farm environmental benefits

Reimer, Thompson, Prokopy, 2012, *Agriculture and Human Values*

1982-2007: 55 U.S. Studies

- Overall Finding:
  - Very few generalizable trends

- However →

Practice Characteristics also Important

Focus on:

- Raising awareness of on-farm and financial benefits
- Environmental benefits
- Compatibility with current farm practices


Indiana Prairie Farmer

Reimer, Weinkauf, Prokopy, 2012, *Journal of Rural Studies*

Q&A Break

PURDUE EXTENSION

FNR-488-W

EXPERT REVIEWED

Adoption of Agricultural Conservation Practices:

Insights from Research and Practice

Authors

Linda S. Prokopy, Associate Professor, Purdue Department of Forestry and Natural Resources; Dan Towery, Conservation Educator of the Indiana Conservation Cropping System Initiative; Nicholas Ribbe, Postdoctoral Research Assistant, Purdue Department of Forestry and Natural Resources

PURDUE UNIVERSITY

FORESTRY AND NATURAL RESOURCES

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Because agriculture dominates the midwestern landscape, it has a huge impact on environmental quality. Agricultural producers are often advised to adopt practices that help to reduce the impact of agriculture on the environment. However, like all humans, they are often reluctant to change, which makes the work of conservation professionals extremely challenging. In this publication, we explore the myths and realities around what motivates farmers to adopt conservation practices. We draw on the authors' combined research and applied practitioner experience with farmer adoption of conservation practices. Most evidence is based on studies and observations of traditional row-crop farmers in the midwestern United States.

We present much of this discussion as a dialogue between two authors, Linda, a Purdue researcher, and Dan, a conservation practitioner, and conclude with important considerations and recommendations for conservation professionals in the field who are trying to encourage conservation practice adoption.

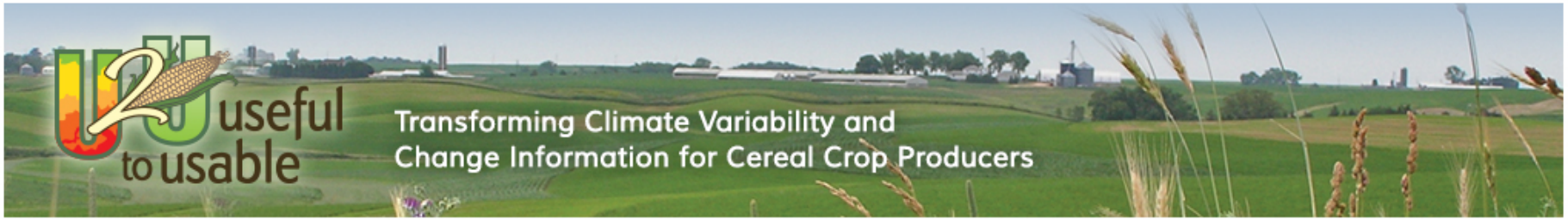
Analysis of Past Research

(Linda, a researcher's view)

When the Natural Resource Social Science (NRSS) lab at Purdue first looked at farmer adoption of conservation practices, we investigated the literature to see what was known. Specifically, we did a quantitative, statistical analysis of 55 studies done in the United States that focused on conservation practice adoption by farmers. These studies covered livestock operations, large cropping systems, and small cropping systems. They looked at operations from Louisiana to California and from the Midwest to the Northeast. Our goal was to find what motivates farmers to adopt conservation practices.

For more information, download this publication at:

tinyurl.com/prokopy


useful
to usable
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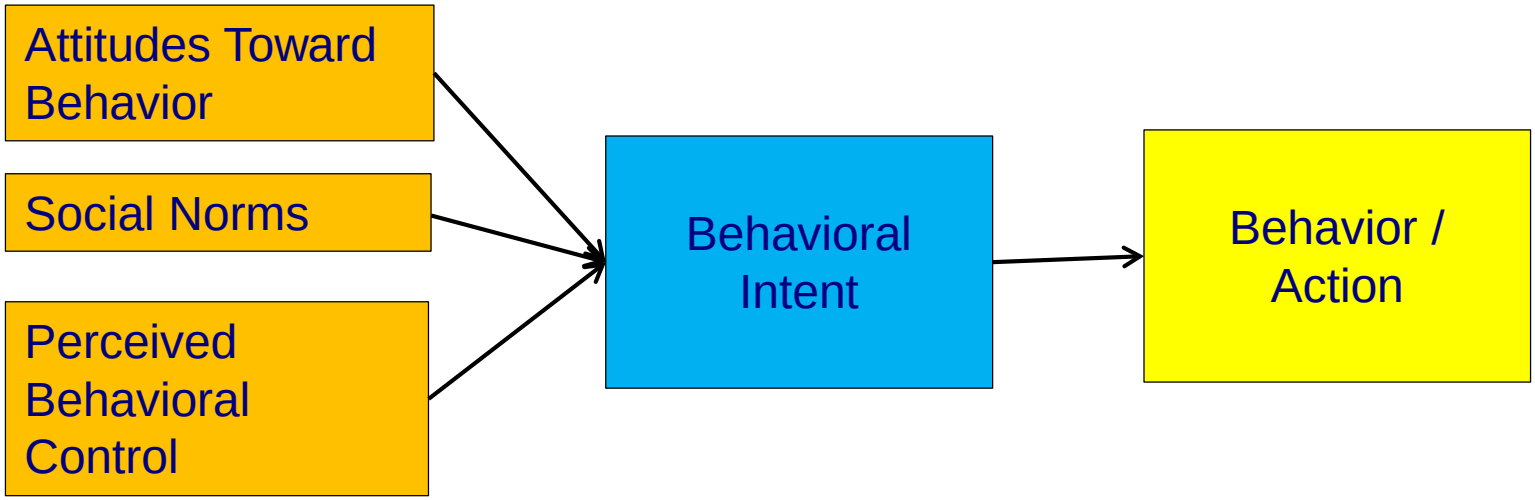
Theory

Theory of Planned Behavior / Reasoned Action Approach



Fishbein and Ajzen, 2010

Social norms

Intention to use climate information

Who's in the farmer's network? Who does the farmer trust?

Subjective norms: what do others think I should do?

Social norms

Intention to use climate information

"I base a lot of what I do on relatives because they are big operators and they like to talk."

Who's in the farmer's network? Who does the farmer trust?

Descriptive norms: what are others doing?

Subjective norms: what do others think I should do?

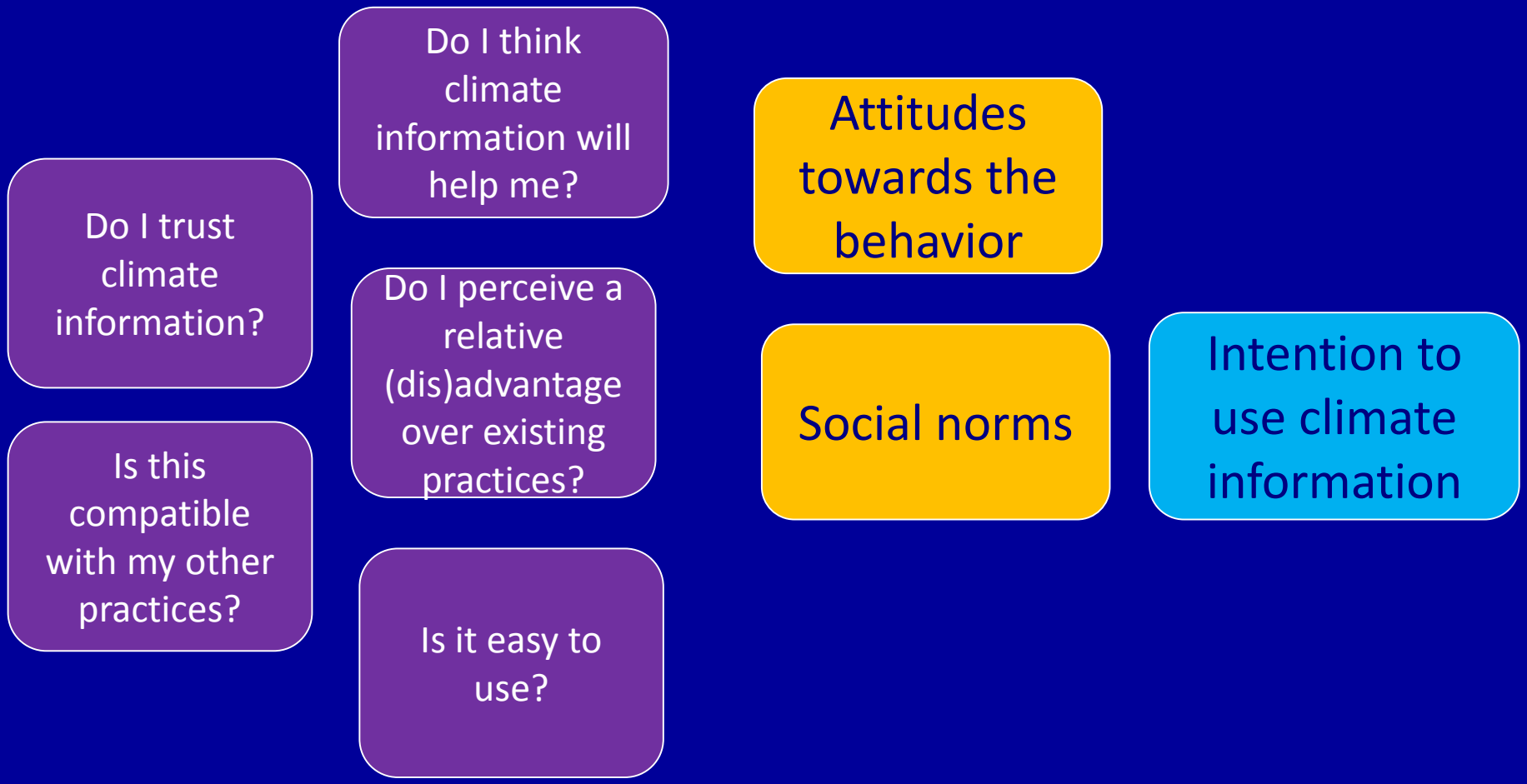
Social norms

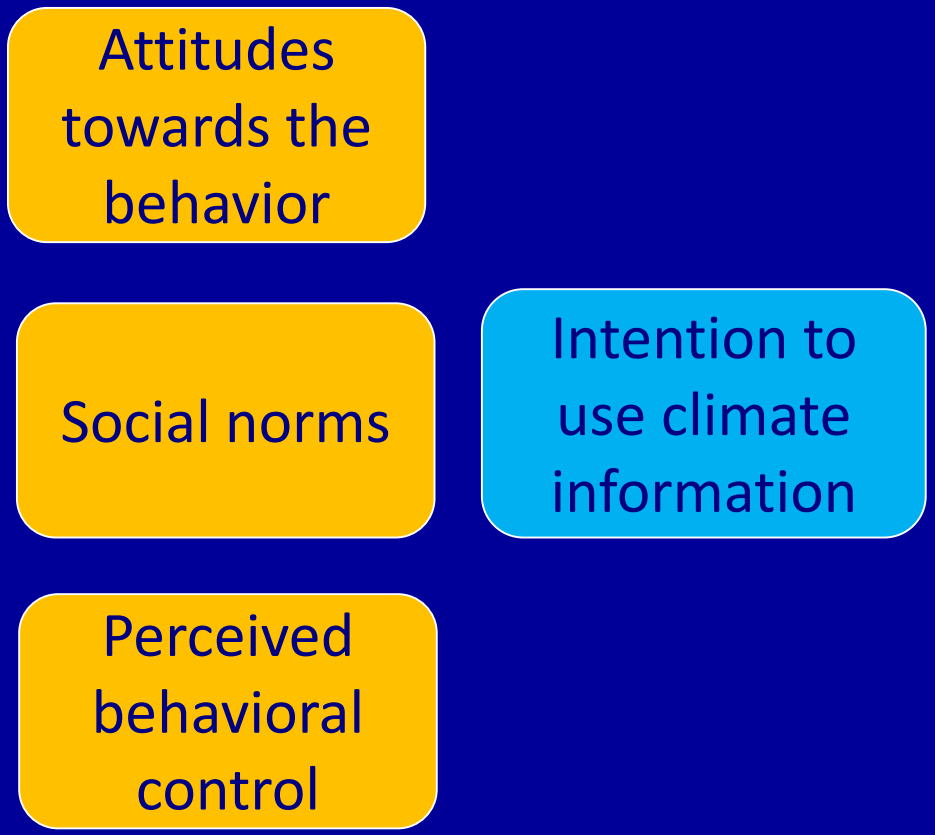
Intention to use climate information

Attitudes towards the behavior

Social norms

Intention to use climate information


Do I think climate information will help me?
Do I trust climate information?
Do I perceive a relative (dis)advantage over existing practices?
Is this compatible with my other practices?
Is it easy to use?
Attitudes towards the behavior
Social norms
Intention to use climate information


Attitudes towards the behavior
Social norms
Perceived behavioral control
Intention to use climate information

Attitudes towards the behavior

Social norms

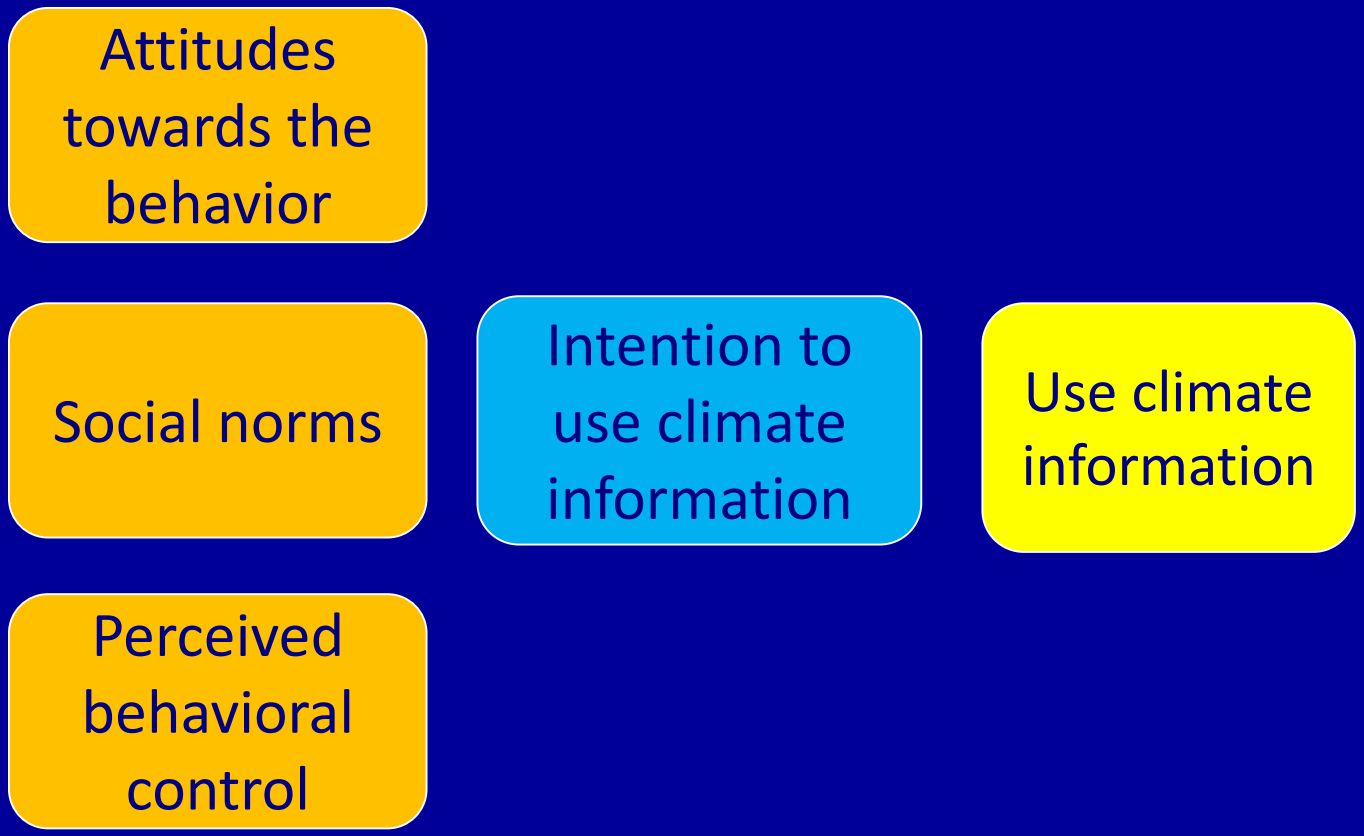
Perceived behavioral control

Intention to use climate information

Do I need to work with a landlord or renter to get this done?

Is it available when I need to make decisions?

Will I have ongoing support to keep the using this information?


Attitudes towards the behavior
Social norms
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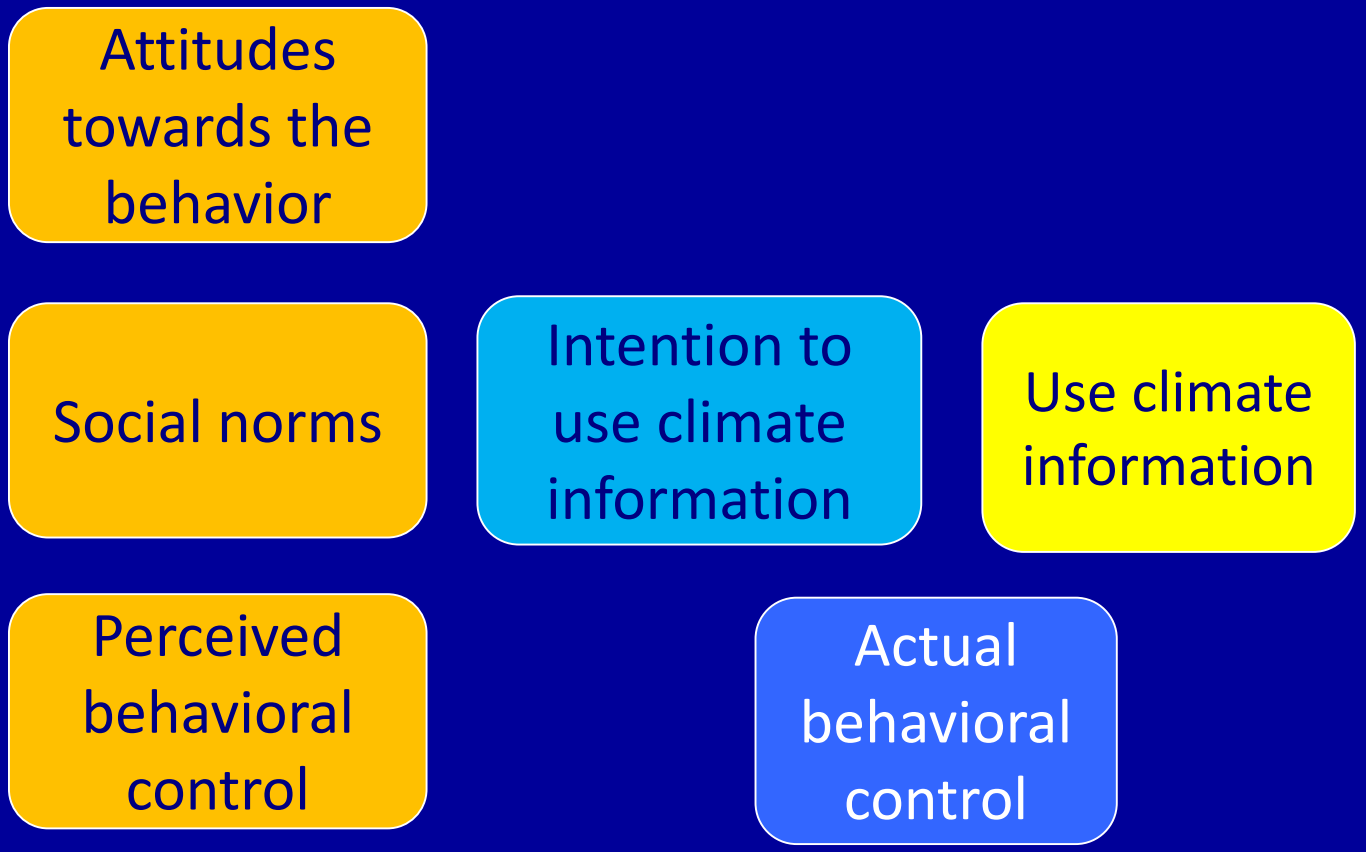
Intention to use climate information
Use climate information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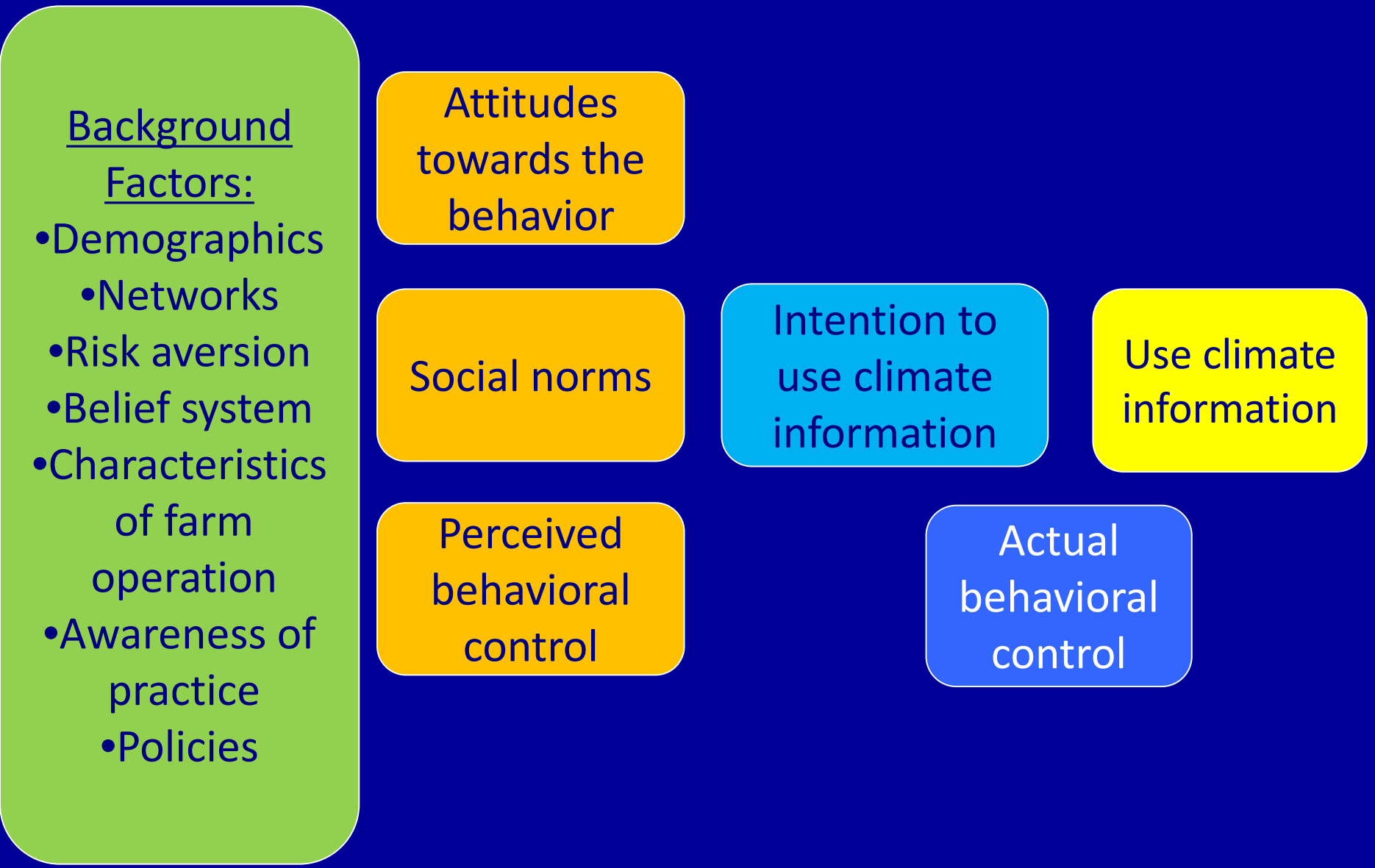
Intention to use climate information
Actual behavioral control
Use climate information


Background Factors:
•Demographics
•Networks
•Risk aversion
•Belief system
•Characteristics of farm operation
•Awareness of practice
•Policies
Attitudes towards the behavior
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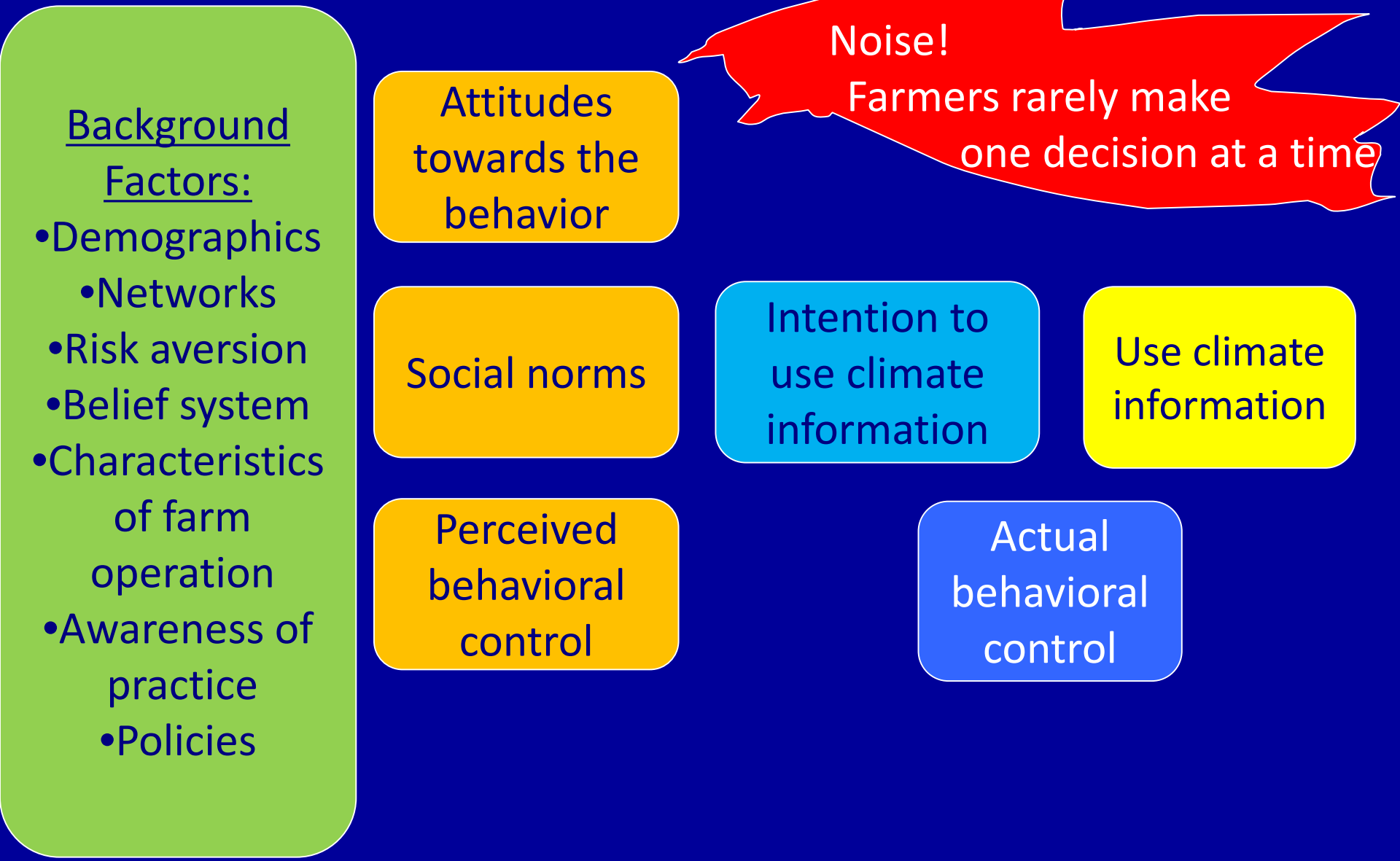
Background Factors:
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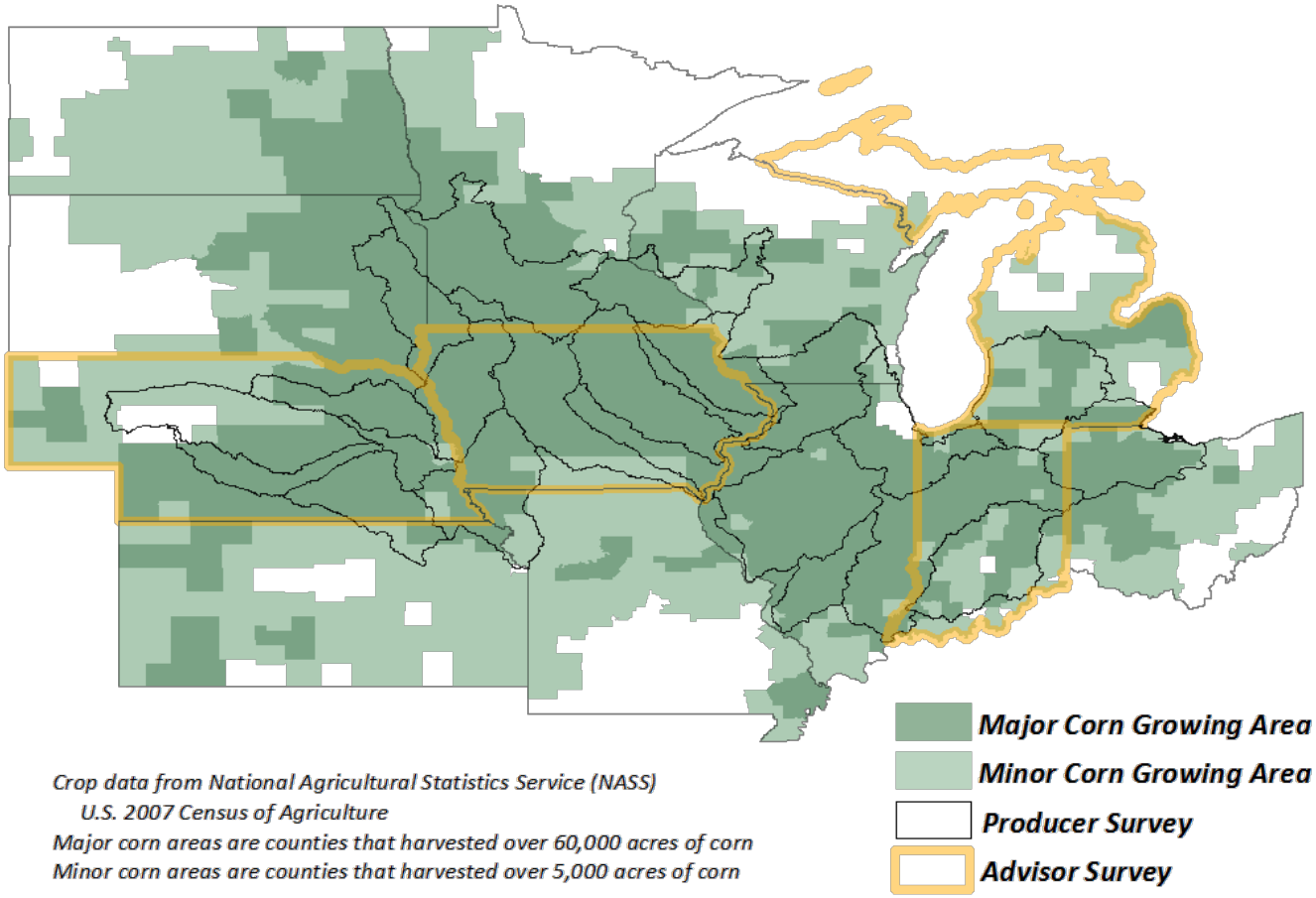
Attitudes towards the behavior
Social norms
Perceived behavioral control
Noise!
Farmers rarely make one decision at a time
Intention to use climate information
Actual behavioral control
Use climate information

Comprehensive Literature Review

- Weather and climate products must be
  - Useful, relevant, context-specific, action-oriented
- Usability and packaging matters
- Collaborative development with end-users is critical
  - Encourages buy-in, trust, sustained product use
- Further explore the role of ag advisors

Mase and Prokopy (2014). Unrealized Potential: A Review of Perceptions and Use of Weather and Climate Information in Agricultural Decision Making. *Weather, Climate, and Society*, **6**(1): 47-61.

U2U Region and Survey Coverage



Crop data from National Agricultural Statistics Service (NASS)
U.S. 2007 Census of Agriculture
Major corn areas are counties that harvested over 60,000 acres of corn
Minor corn areas are counties that harvested over 5,000 acres of corn

Climate Needs Assessment Surveys

Advisor Survey

- 2,530 advisors in 4 states (Extension in all 12 states)
- CCAs, Extension, bankers, agro-business, state/federal, etc.

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Producer Survey

- CS-CAP partnership
- 4,778 farmers in 22 watersheds
- 60% of US corn production

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Questions:

- Use of weather/climate information
- Risk management strategies
- Climate change concerns and beliefs
- Influential information sources

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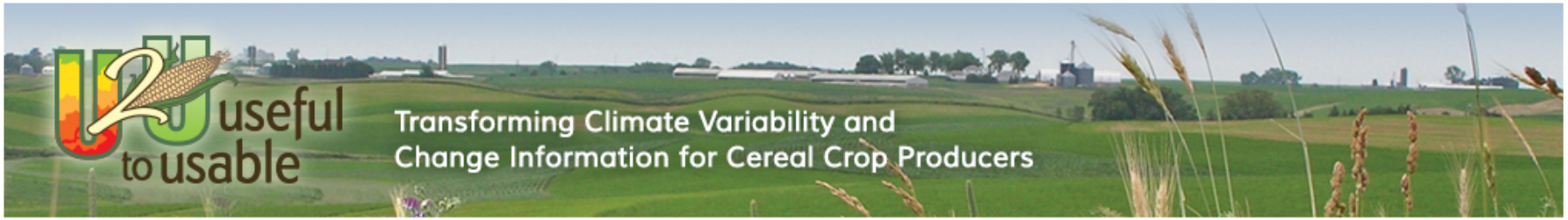
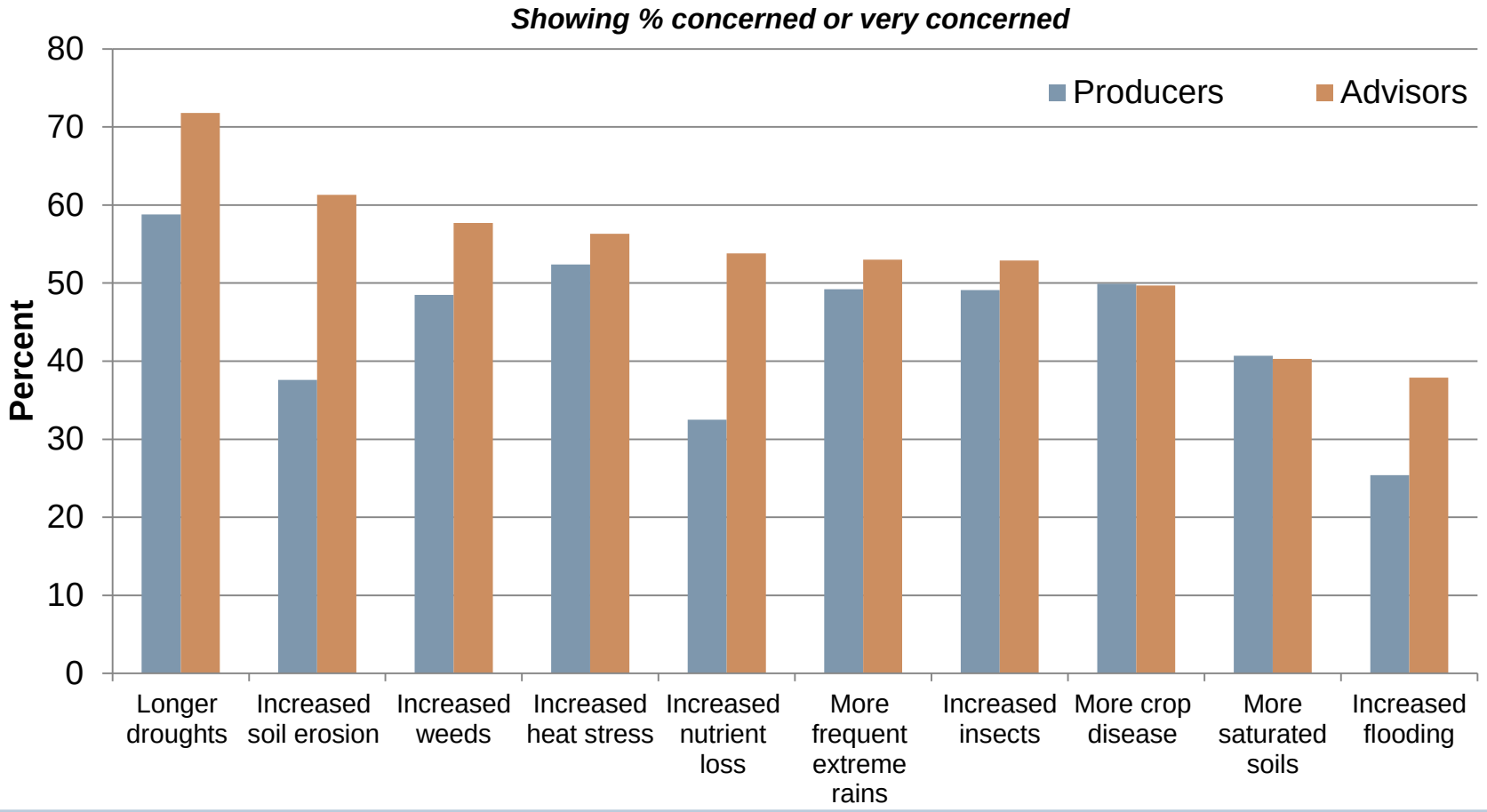
Surveys Conducted Feb-Mar 2012

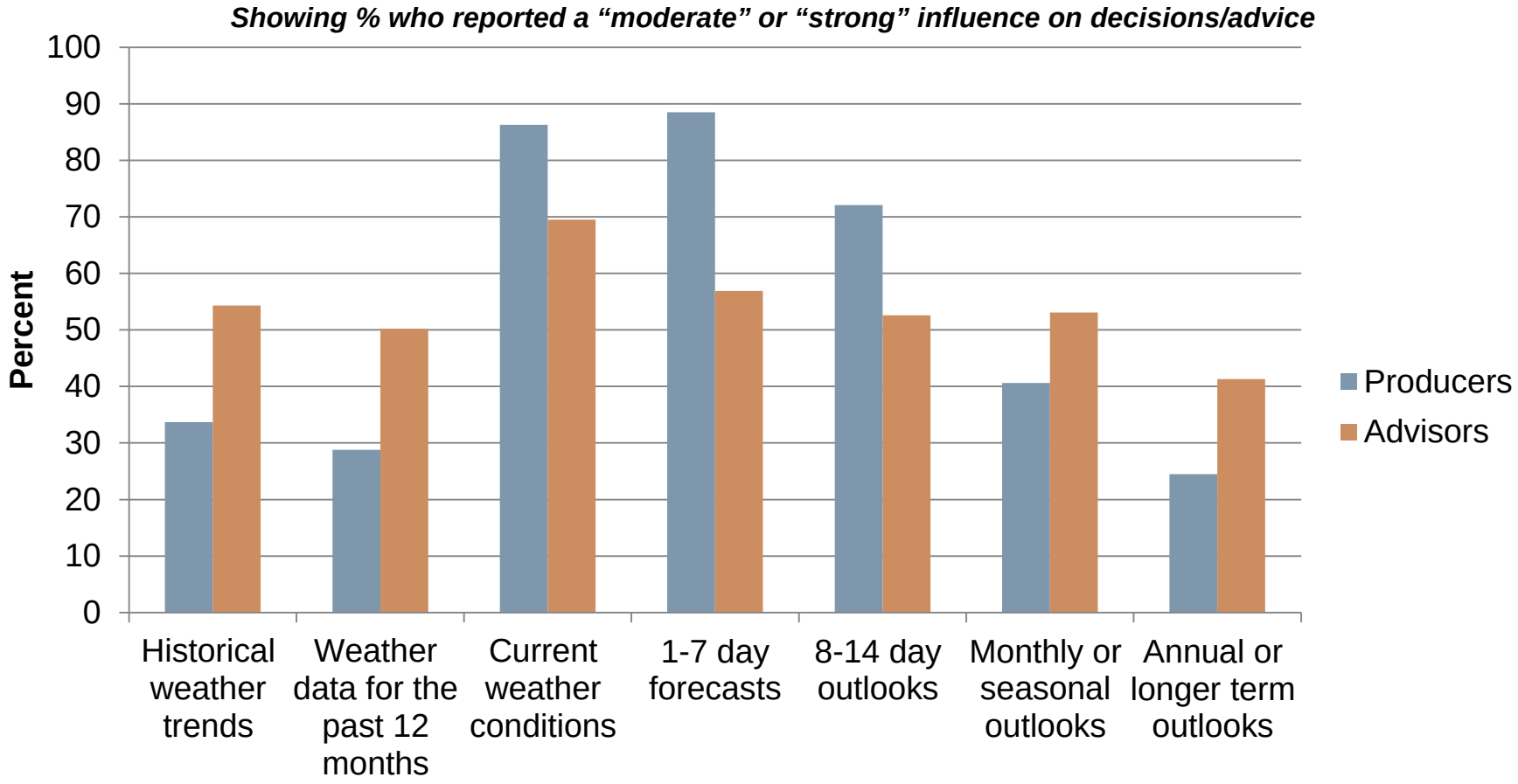


Attitudes: Do Farmers and Advisors Worry About Climate?

Ag community is concerned about climate-related impacts



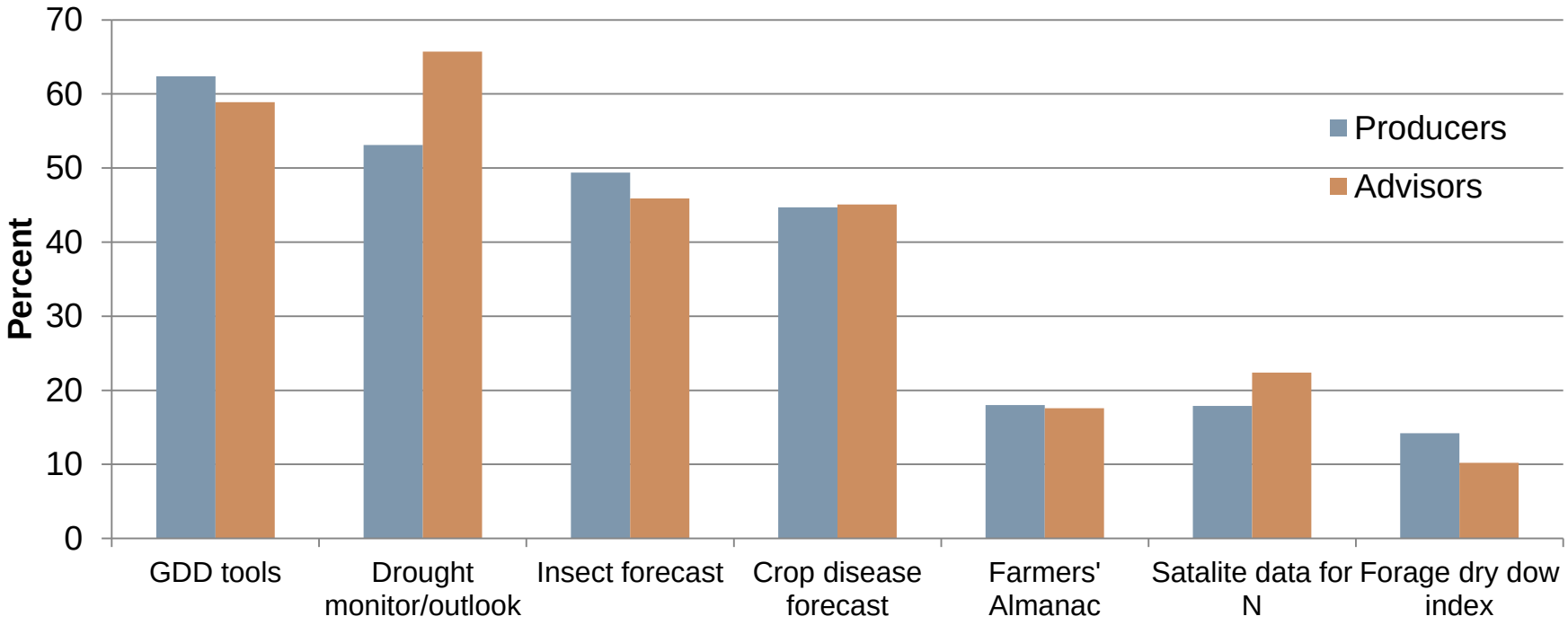
Historical and future climate info is underutilized



Prokopy et al. 2013. "Agricultural Advisors: A Receptive Audience for Weather and Climate Information?" *Weather, Climate, and Society*, 5:162-167

Mixed use of decision support resources

Showing % who reported using any of the following weather-related decision support resources



Prokopy et al. 2013. "Agricultural Advisors: A Receptive Audience for Weather and Climate Information?" *Weather, Climate, and Society*, 5:162-167

Advisors do see value in climate info for ag

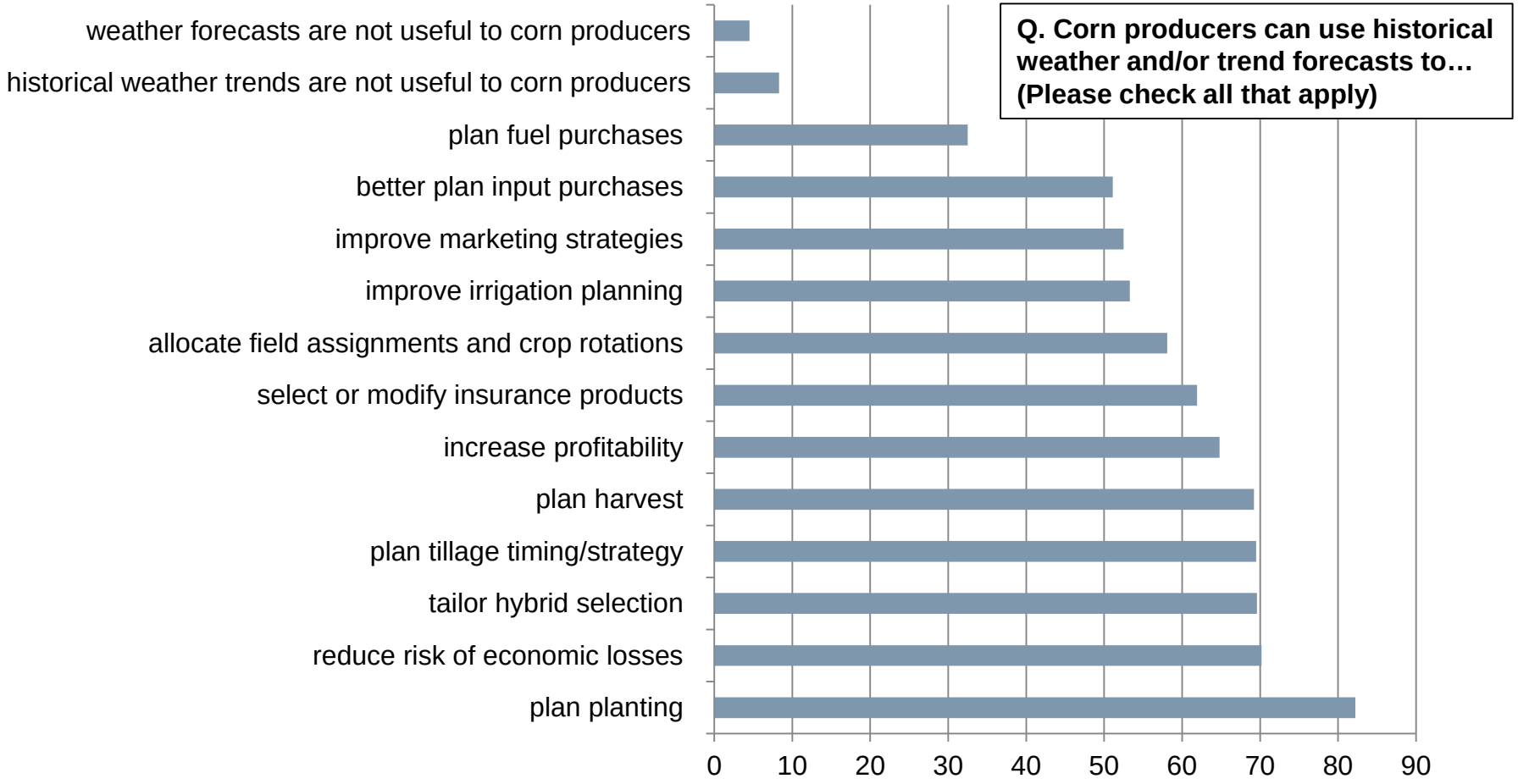
"I would like to provide advice based on climate forecasts" (n=1696)

- Disagree/Strongly Disagree = 23%
- Uncertain = 45%
- Agree/Strongly Agree = 32%

"Ag producers are interested in using weather and climate information" (n=1743)

- Disagree/Strongly Disagree = 2%
- Uncertain = 19%
- Agree/Strongly Agree = 79%

Advisors do see value in climate info for ag



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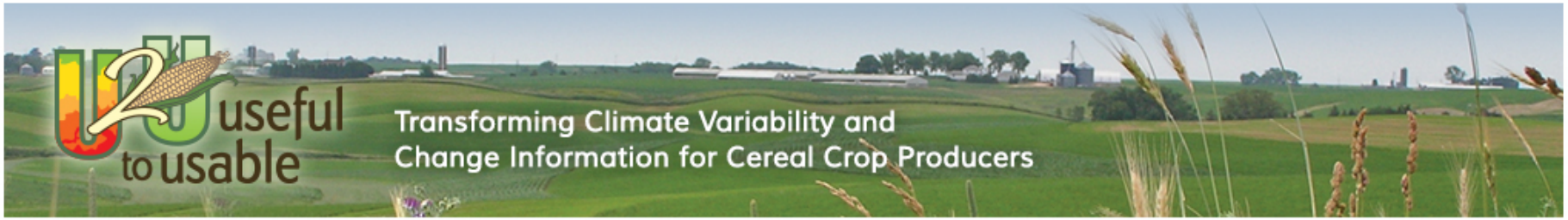

Farmers are still uncertain about the value of climate info

"I am willing to use seasonal climate forecasts to help me make decisions about agricultural practices" (n=4,559)

- Disagree/Strongly Disagree = 20%
- Uncertain = 44%
- Agree/Strongly Agree = 36%

Climate change beliefs are diverse, and they matter!

Climate change is occurring, and it is caused mostly by human activities
Climate change is occurring, and it is caused equally by natural changes in the environment and human activities
Climate change is occurring, and it is caused mostly by natural changes in the environment
There is not sufficient evidence to know with certainty whether climate change is occurring or not
Climate change is not occurring

Arbuckle, Prokopy et al. 2012, Climatic Change; Prokopy et al., In press, Bulletin of the American Meteorological Society

Climate change beliefs are diverse, and they matter!

	Producers
Climate change is occurring, and it is caused mostly by human activities	8%
Climate change is occurring, and it is caused 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%

Arbuckle, Prokopy et al. 2012, Climatic Change; Prokopy et al., In press, Bulletin of the American Meteorological Society

Climate change beliefs are diverse, and they matter!

	Producers	Advisors
Climate change is occurring, and it is caused mostly by human activities	8%	12.6%
Climate change is occurring, and it is caused equally by natural changes in the environment and human activities	33%	37%
Climate change is occurring, and it is caused mostly by natural changes in the environment	25%	24.9%
There is not sufficient evidence to know with certainty whether climate change is occurring or not	31%	23.3%
Climate change is not occurring	4%	2.3%

Arbuckle, Prokopy et al. 2012, Climatic Change; Prokopy et al., In press, Bulletin of the American Meteorological Society

Climate change beliefs are diverse, and they matter!

	Producers	Advisors	U2U
Climate change is occurring, and it is caused mostly by human activities	8%	12.6%	69%
Climate change is occurring, and it is caused equally by natural changes in the environment and human activities	33%	37%	28%
Climate change is occurring, and it is caused mostly by natural changes in the environment	25%	24.9%	3%
There is not sufficient evidence to know with certainty whether climate change is occurring or not	31%	23.3%	0%
Climate change is not occurring	4%	2.3%	0%

Arbuckle, Prokopy et al. 2012, Climatic Change; Prokopy et al., In press, Bulletin of the American Meteorological Society

Climate change beliefs are diverse, and they matter!

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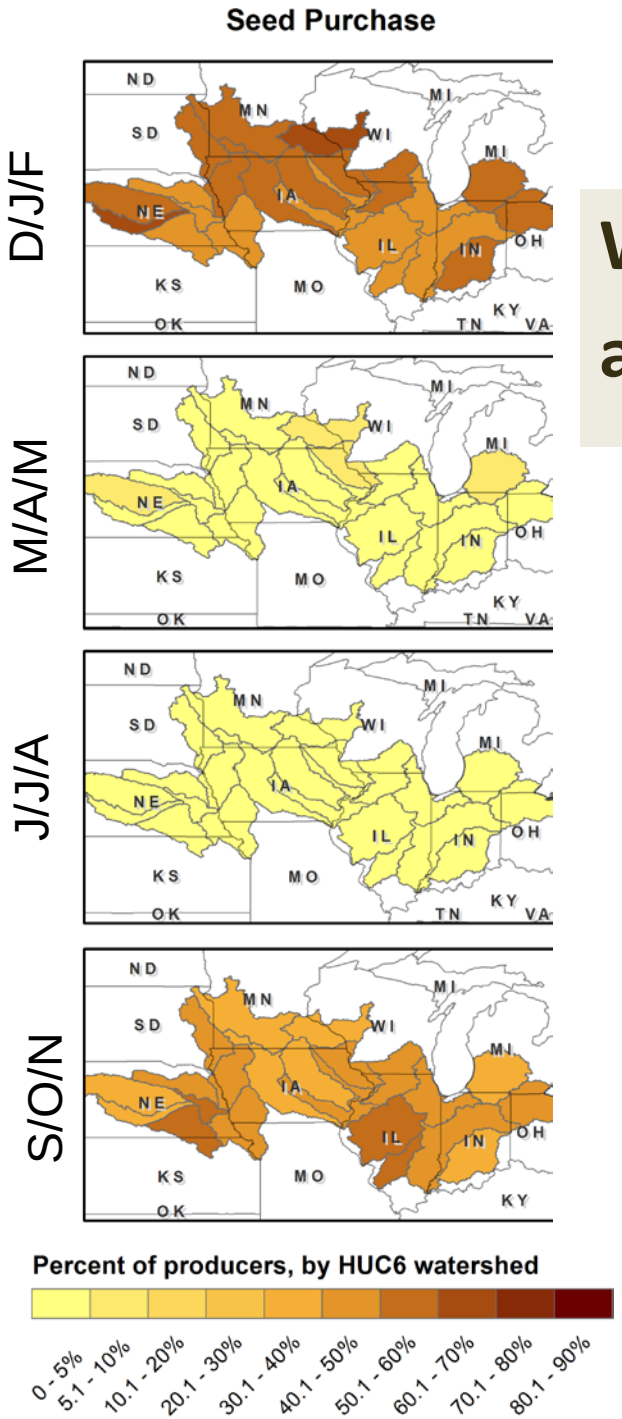
Climate change is not occurring	4%	2.3%	0%

Climate change beliefs significantly influence perceived climate risks, willingness to use climate info, risk management, adaptation beliefs and trusted info sources.

Arbuckle, Prokopy et al. 2012, Climatic Change; Prokopy et al., In press, Bulletin of the American Meteorological Society

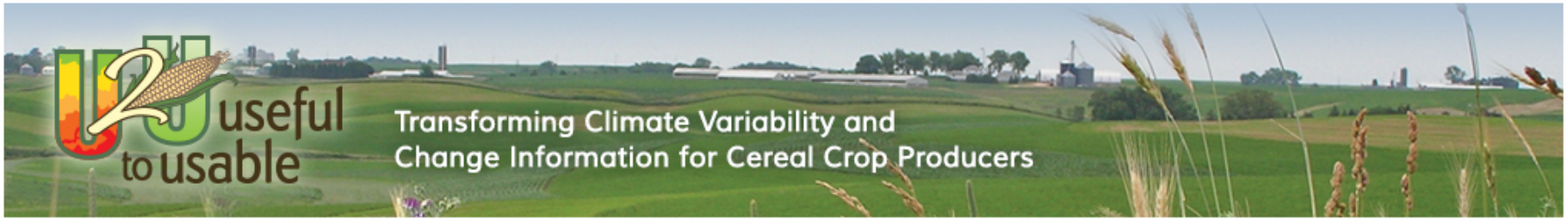
Perceived Behavioral Control



When can climate information influence a decision making process?

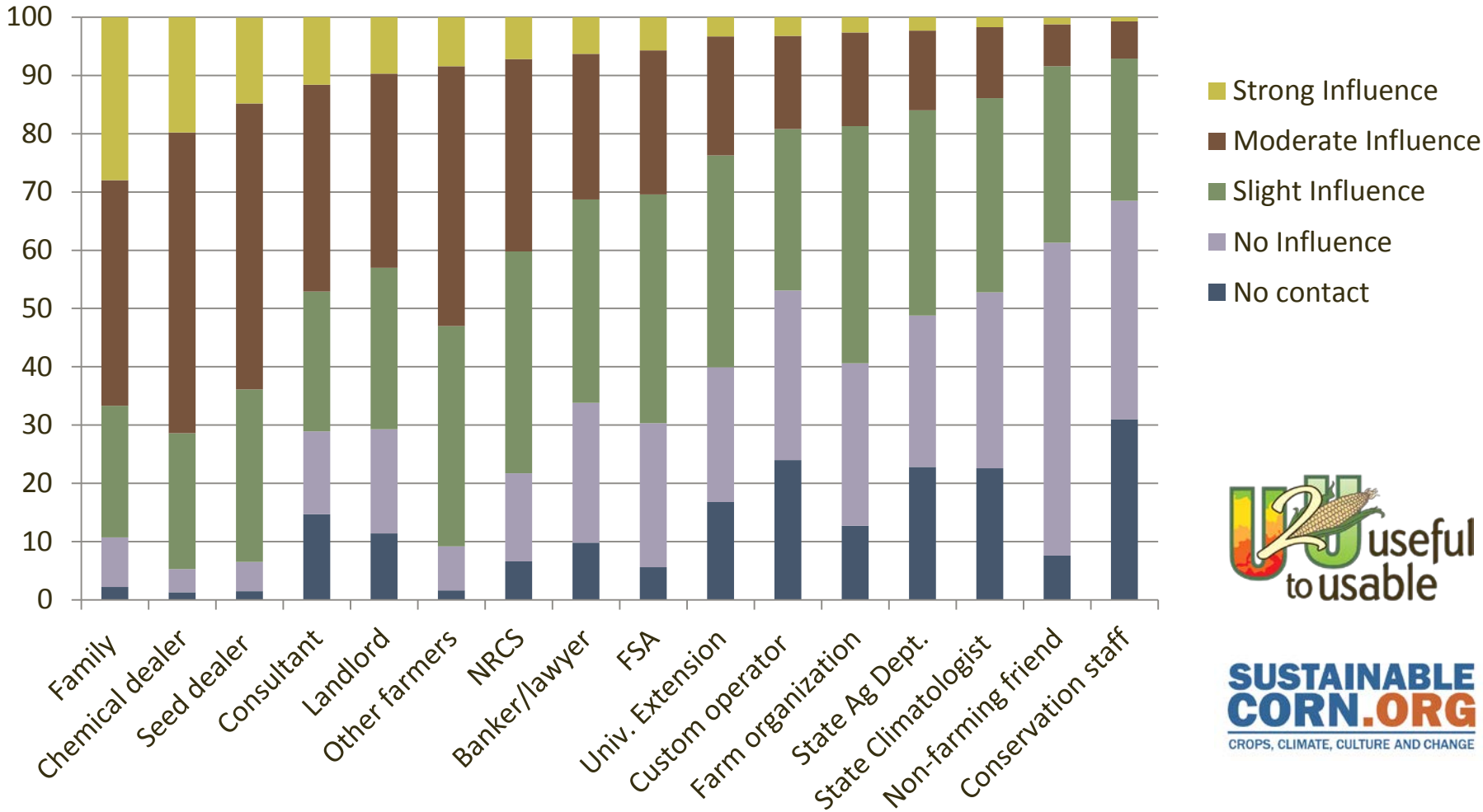
- Survey data revealed when different decisions made across the region.
- These can be “entry points” for climate information.
- Some decisions made in advance (e.g. seed purchase); some more tactical (e.g. cover crops)

Haigh et al. In Press. “Mapping the Decision Points and Climate Information use of Agricultural Producers across the U.S. Corn Belt.” *Climate Risk Management*



Social Norms

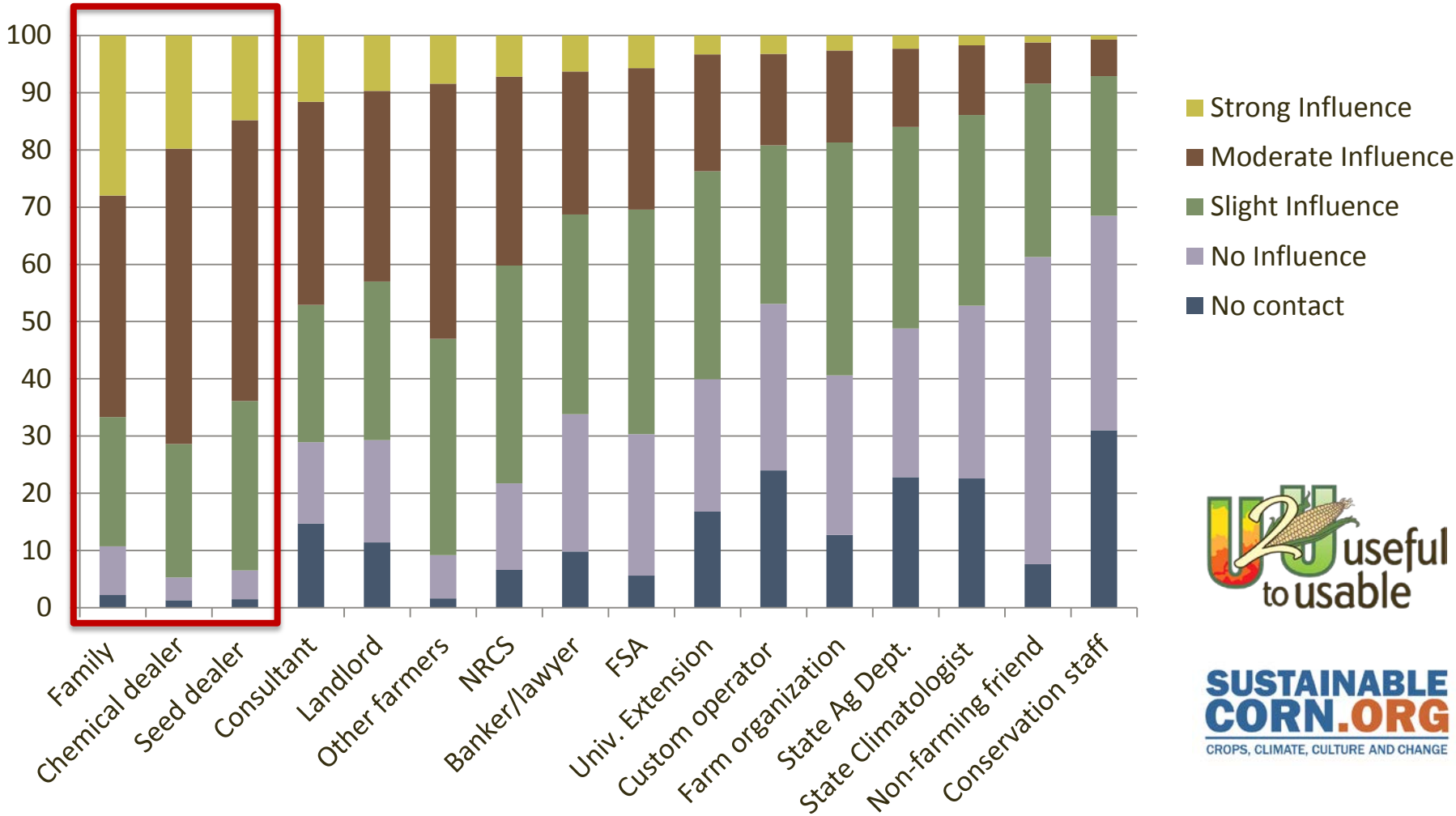
Q: Please indicate how influential the following groups and individuals are when you make decisions about agricultural practices and strategies



Results from a 2012 survey of Midwestern corn producers conducted by Useful to Usable (U2U) and SustainableCorn.org

Prokopy et al. 2014. "Adoption of Agricultural Conservation Practices: Insights from Research and Practice" Purdue Extension Publication FNR-488-W.

Q: Please indicate how influential the following groups and individuals are when you make decisions about agricultural practices and strategies



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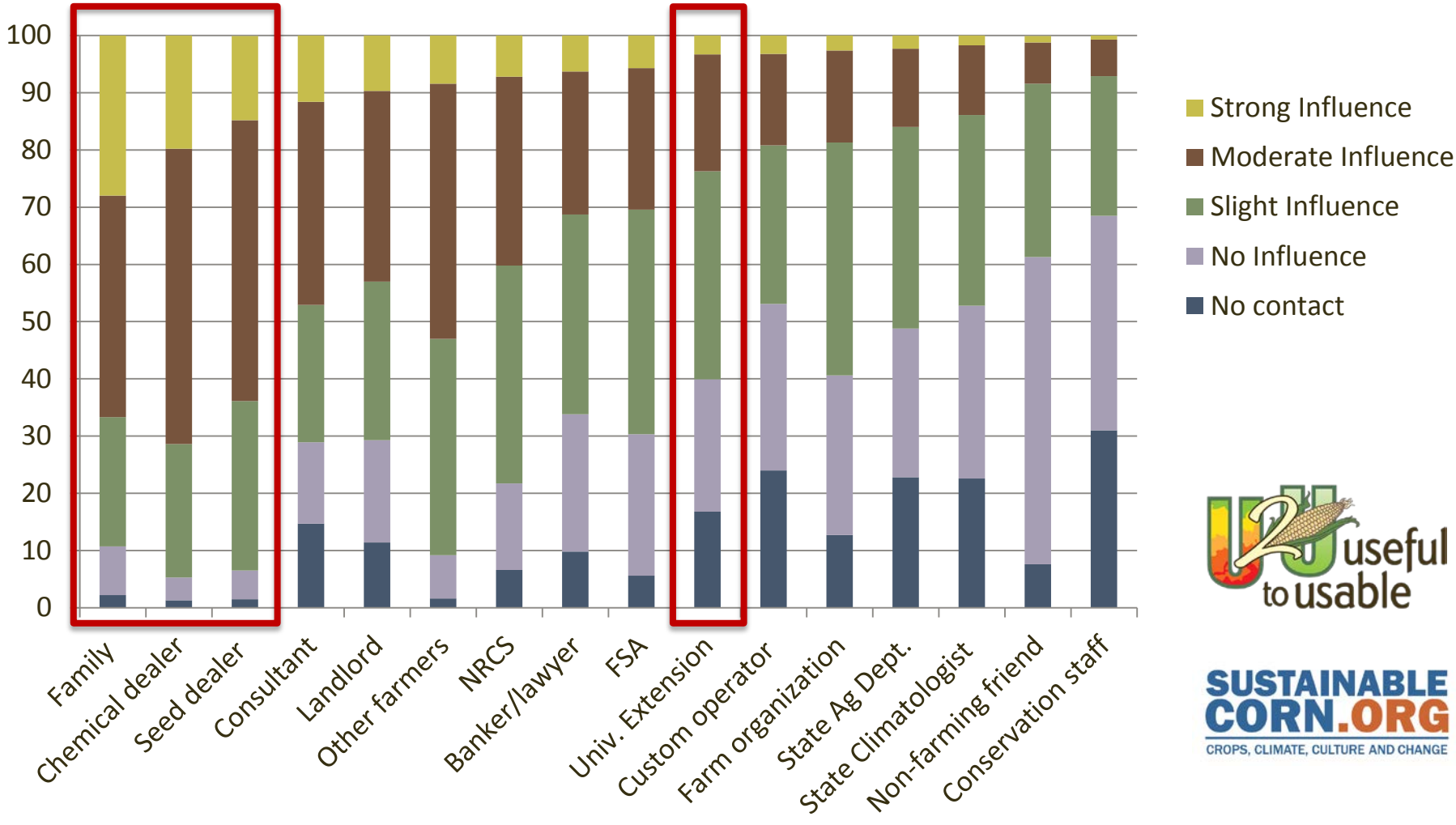
Q: Please indicate how influential the following groups and individuals are when you make decisions about agricultural practices and strategies

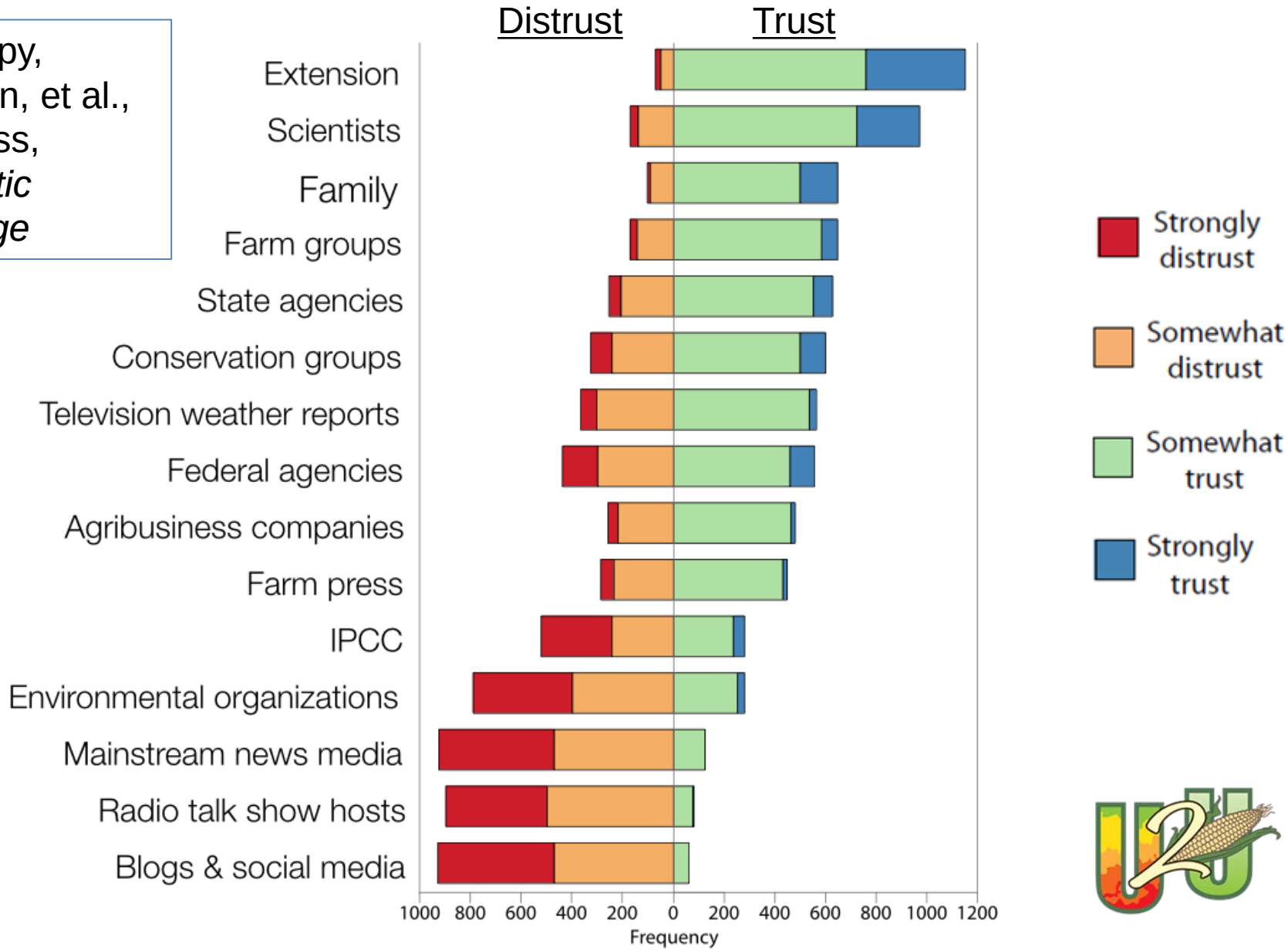


Results from a 2012 survey of Midwestern corn producers conducted by Useful to Usable (U2U) and SustainableCorn.org

Prokopy et al. 2014. "Adoption of Agricultural Conservation Practices: Insights from Research and Practice" Purdue Extension Publication FNR-488-W.

Who do non-Extension ag advisors trust for climate information?

Prokopy, Carlton, et al., in press, *Climatic Change*



Focus groups and interviews

- Surveys alone are not enough!
  - Context and meaning to quantitative results
  - Listen to their concerns and needs
  - Build trust with on-going “learning communities”
- Conducted 12 focus groups with farmers and advisors
  - Indiana, Nebraska
  - Results/feedback communicated directly to DST developers
- Interviews
  - 60+ advisors
  - 22 regional and state climatologists

Keep connecting with stakeholders!

- Need ongoing interaction during all phases
  - Resource intensive but worthwhile
- In-person training at known farmer and advisor events
  - Multi-year contact to build trust
  - 32 outreach events in the last year!
- Building a web and social media presence
- Systematic program evaluation
  - DST usability
  - Influence of products on knowledge and decisions

Summary

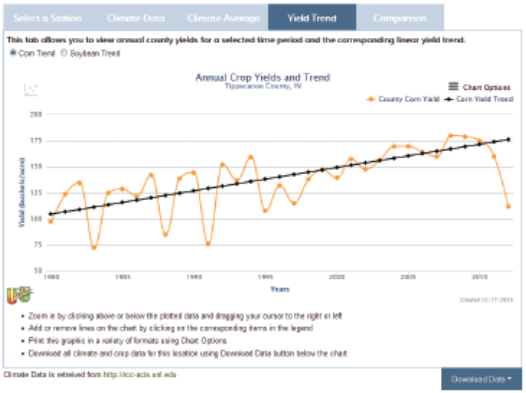
- High concern for climate impacts, but climate information is underutilized in ag
- Climate info has value for ag production
  - Useful, relevant, context-specific
  - Usability and packaging matters
  - Collaborative development with end-users is critical (trust!)
- Farmers are greatly influenced by advisors, and advisors trust scientists and Extension for climate information
  - Leverage this trust!

AVAILABLE NOW

AgClimate4U.org

AgClimate View DST

This tool provides easy-to-use historical climate and crop yield data for the Corn Belt.

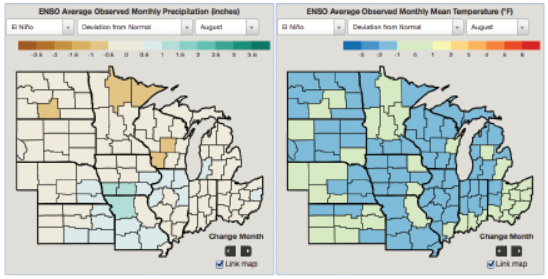


Corn GDD DST

Track real-time GDD accumulations and learn about climate risks for corn development.

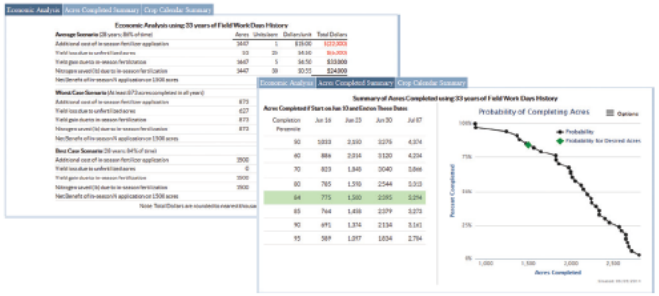
Climate Patterns Viewer DST

Connect global climate conditions to local climate impacts.



Corn Split N DST

Determine the feasibility and profitability of using in-season nitrogen application for corn production.



Thank you!

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