



United States Department of Agriculture
National Institute of Food and Agriculture

Useful to Usable: Lessons Learned about Selling Conservation



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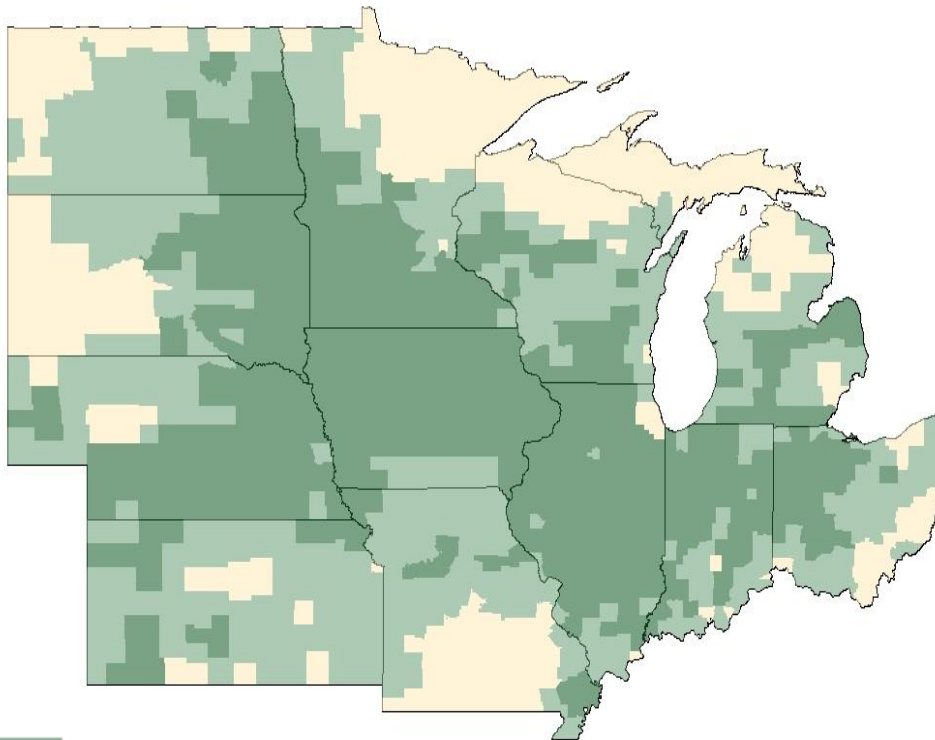
Transforming Climate Variability and
Change Information for Cereal Crop Producers


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



 Major Corn Growing Area
 Minor Corn Growing Area



Transforming Climate Variability and
Change Information for Cereal Crop Producers

U2U Team

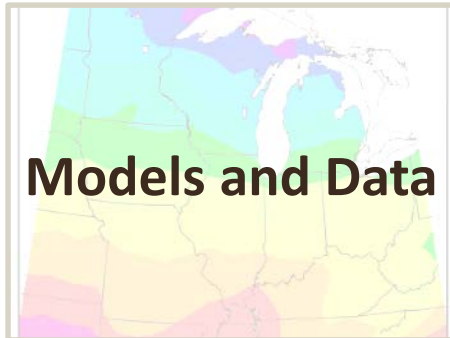
climatologists, crop modelers, agronomists,
IT specialists, economists, sociologists, Extension, and more





Transforming Climate Variability and
Change Information for Cereal Crop Producers

Project Objectives



Models and Data



Stakeholder Input




Transforming Climate Variability and
Change Information for Cereal Crop Producers

Project Objectives



Models and Data

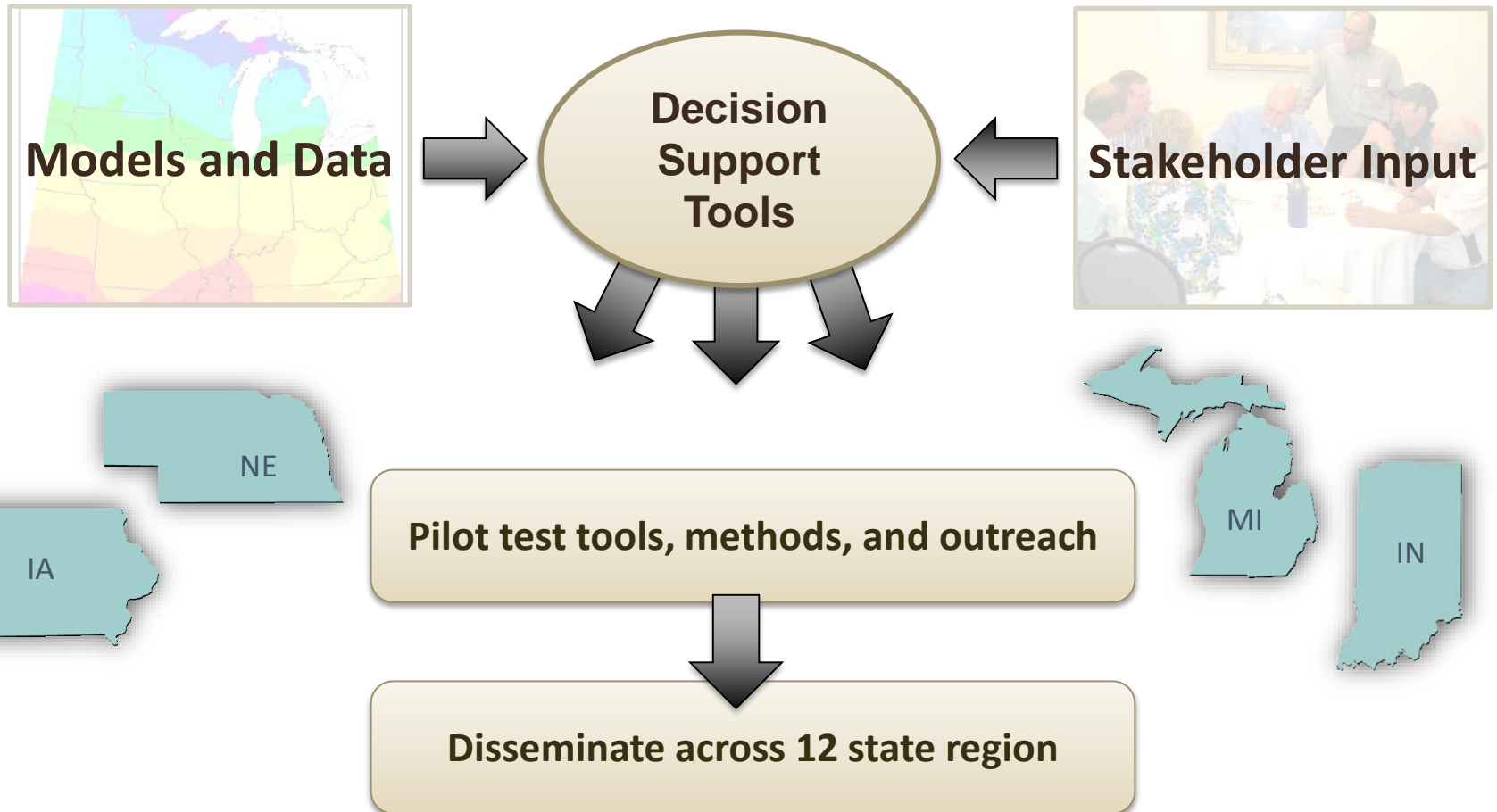


Decision
Support
Tools



Stakeholder Input

Project Objectives





- There is no shortage of data/models!
- Past research and experience shows existing products are underutilized, not meeting farmers'/advisors' needs
- Guiding principle: 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





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Surveys

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

Your Views on the LaMoine River Watershed

The local watershed project is conducting the survey to check how you feel about the watershed. The purpose of the survey is to learn the water users' views on your necessary support for some projects.

We ask that the survey be completed by the person in your household that makes most of the water decisions and is in the best position to make the water users' views known. Your answers will be kept confidential and will be shared only with those who will be making decisions about the watershed.

Please do not write in the space provided for the survey. If you have any questions, please call the project at 508-548-1234. Thank you for your participation.

LaMoine River Watershed

PLEASE READ BEFORE BEGINNING THIS SURVEY:

The survey must be completed by an individual who has lived in the watershed for at least 10 years. Please mark all answers clearly, in pencil, on the back of the survey.

Example "A" Example "B"

Overall, how would you rate the quality of water in the LaMoine River Watershed?

	Very Good	Good	Fair	Poor	Very Poor
1. Potability	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Excessing fish caught in the river	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Performance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Freshness	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Fresh fishery	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. For some beauty	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

On the following, which best fits your opinion of what a watershed is? Check the box that corresponds to your answer.

<input type="checkbox"/> A basin that retains water after a storm in a catchment.
<input type="checkbox"/> The land area that drains into a specific water body.
<input type="checkbox"/> Water under stress that has a water treatment plant.
<input type="checkbox"/> A small trapper where water is used.
<input type="checkbox"/> None of the above.
<input type="checkbox"/> I don't know.

Do you know the name of your watershed?

<input type="checkbox"/> Yes. I know the name of my watershed.
<input type="checkbox"/> The name of my watershed is _____.
<input type="checkbox"/> No. I don't know the name of my watershed.

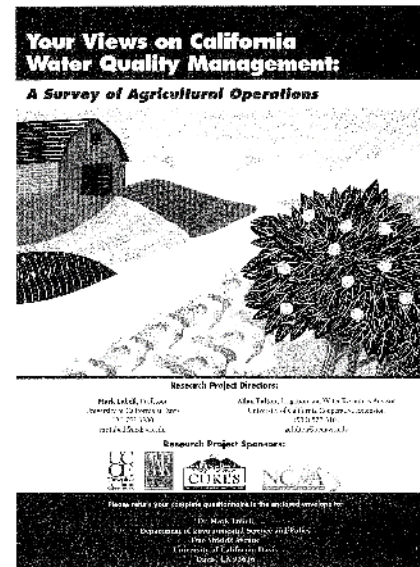
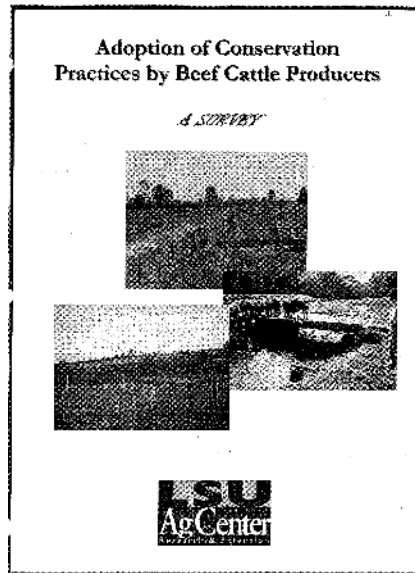


Interviews and Focus Groups

- 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



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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



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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*



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Q&A Break

PURDUE EXTENSION FHR-468-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 Tawney, Conservation Educator of the Indiana Conservation Cropping System Initiative; Nicholas Rubin, Postdoctoral Research Associate, Purdue Department of Forestry and Natural Resources

PURDUE UNIVERSITY FORESTRY and NATURAL RESOURCES
www.thcpurdue.edu

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

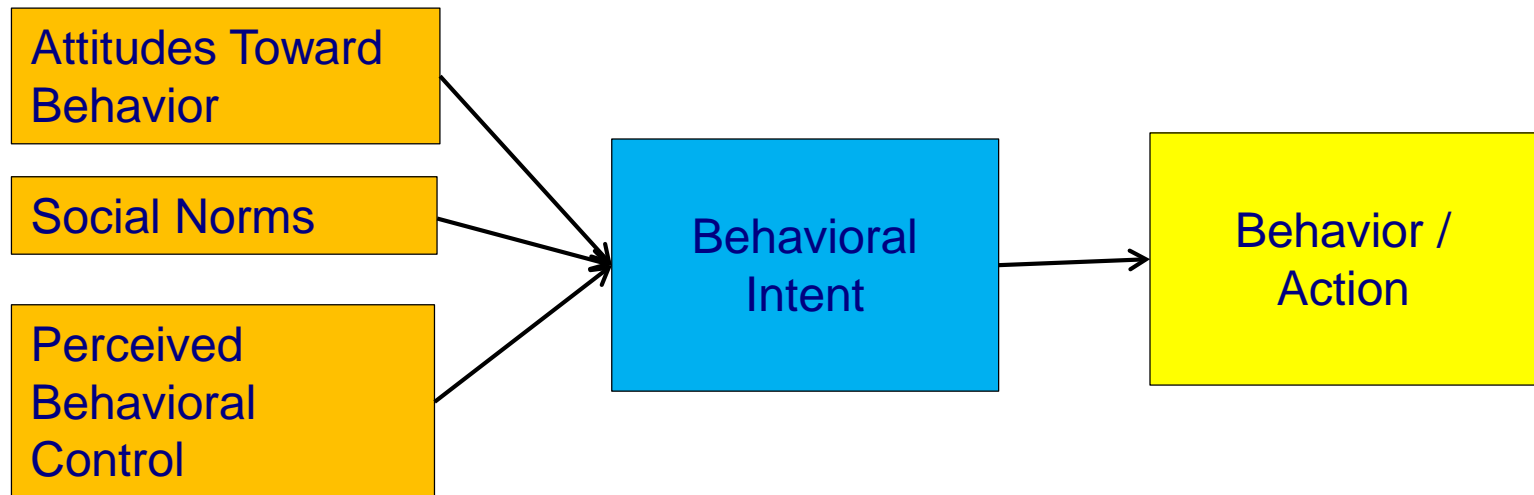


Theory



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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."

Descriptive norms: what are others doing?

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

Attitudes
towards the
behavior

Social norms

Intention to
use climate
information

Do I trust
climate
information?

Do I think
climate
information will
help me?

Attitudes
towards the
behavior

Is this
compatible
with my other
practices?

Do I perceive a
relative
(dis)advantage
over existing
practices?

Social norms

Intention to
use climate
information

Is it easy to
use?

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?

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

Is it available when I need to make decisions?

Attitudes towards the behavior

Social norms

Perceived behavioral control

Intention to use climate information

Attitudes
towards the
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Social norms

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Use climate
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Perceived
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Intention to
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information

Use climate
information

Actual
behavioral
control

Background
Factors:

- Demographics
 - Networks
- Risk aversion
- Belief system
- Characteristics of farm operation
- Awareness of practice
- Policies

Attitudes towards the behavior

Social norms

Perceived behavioral control

Intention to use climate information

Use climate information

Actual behavioral control

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

Use climate information

Actual behavioral control



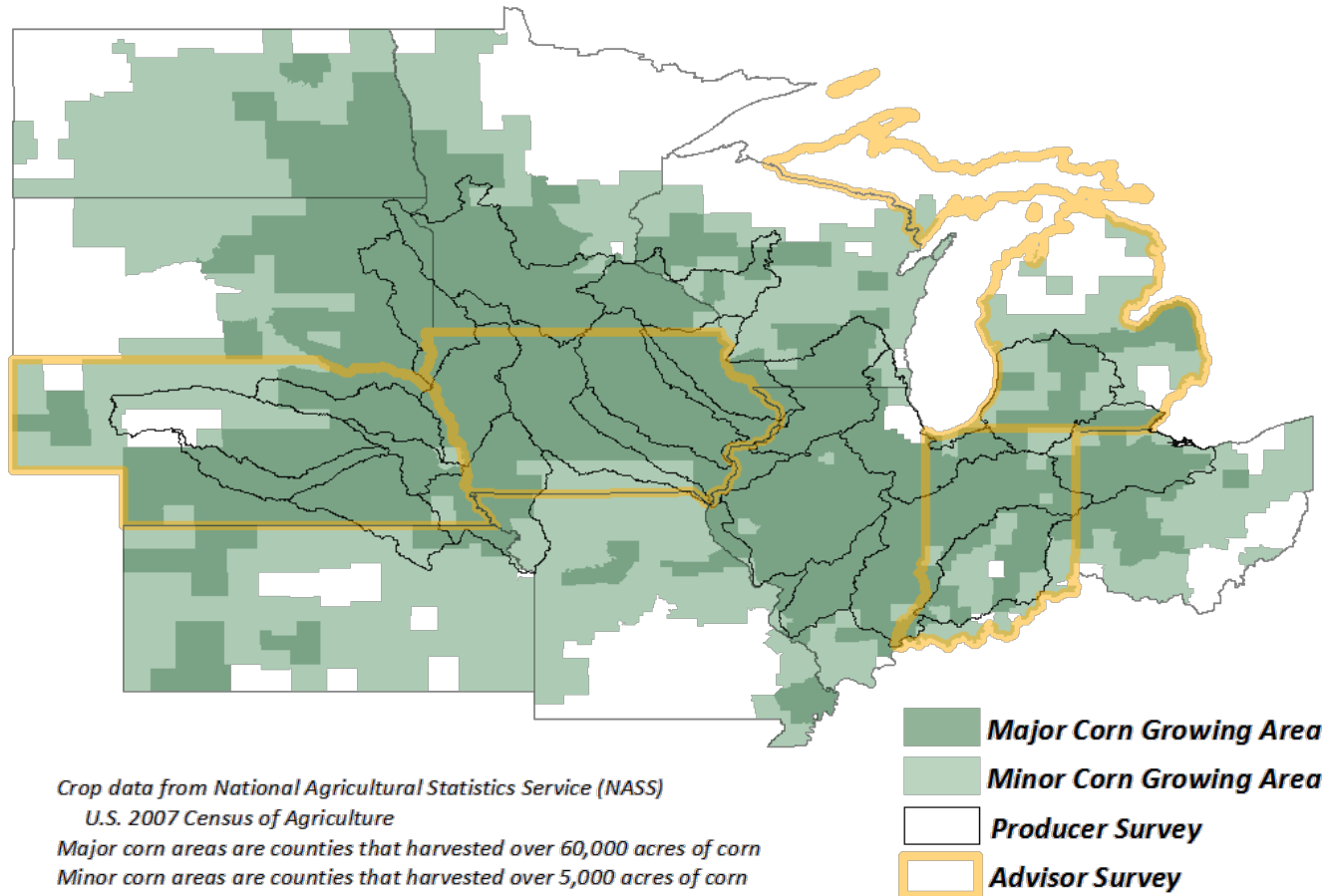
Comprehensive Literature Review

- 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



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U2U Region and Survey Coverage





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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Climate Needs Assessment Surveys

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Producer Survey

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



Climate Needs Assessment Surveys

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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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Climate Needs Assessment Surveys

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Producer Survey

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Surveys
Conducted
Feb-Mar
2012

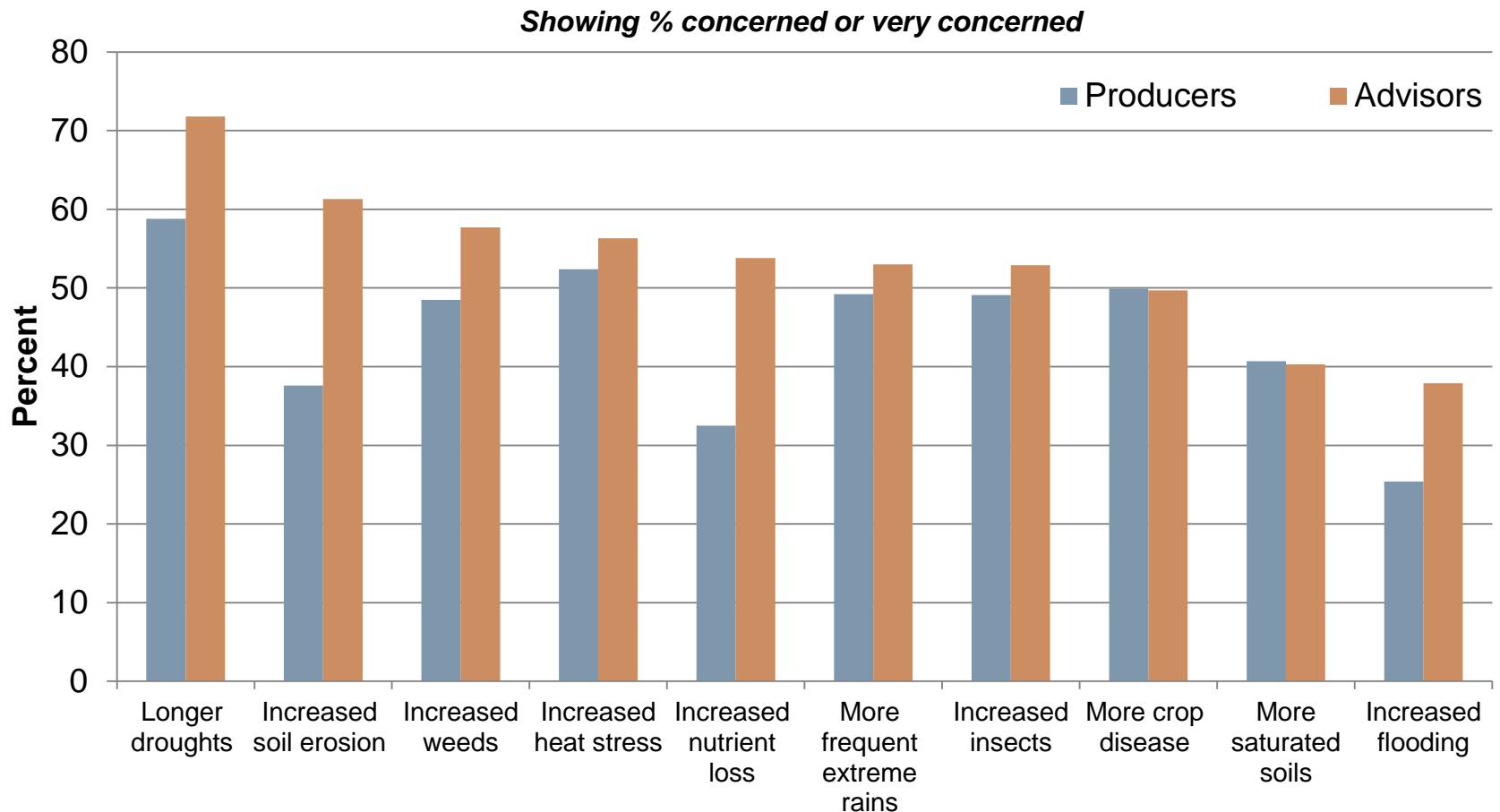


Attitudes: Do Farmers and Advisors Worry About Climate?



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Ag community is concerned about climate-related impacts

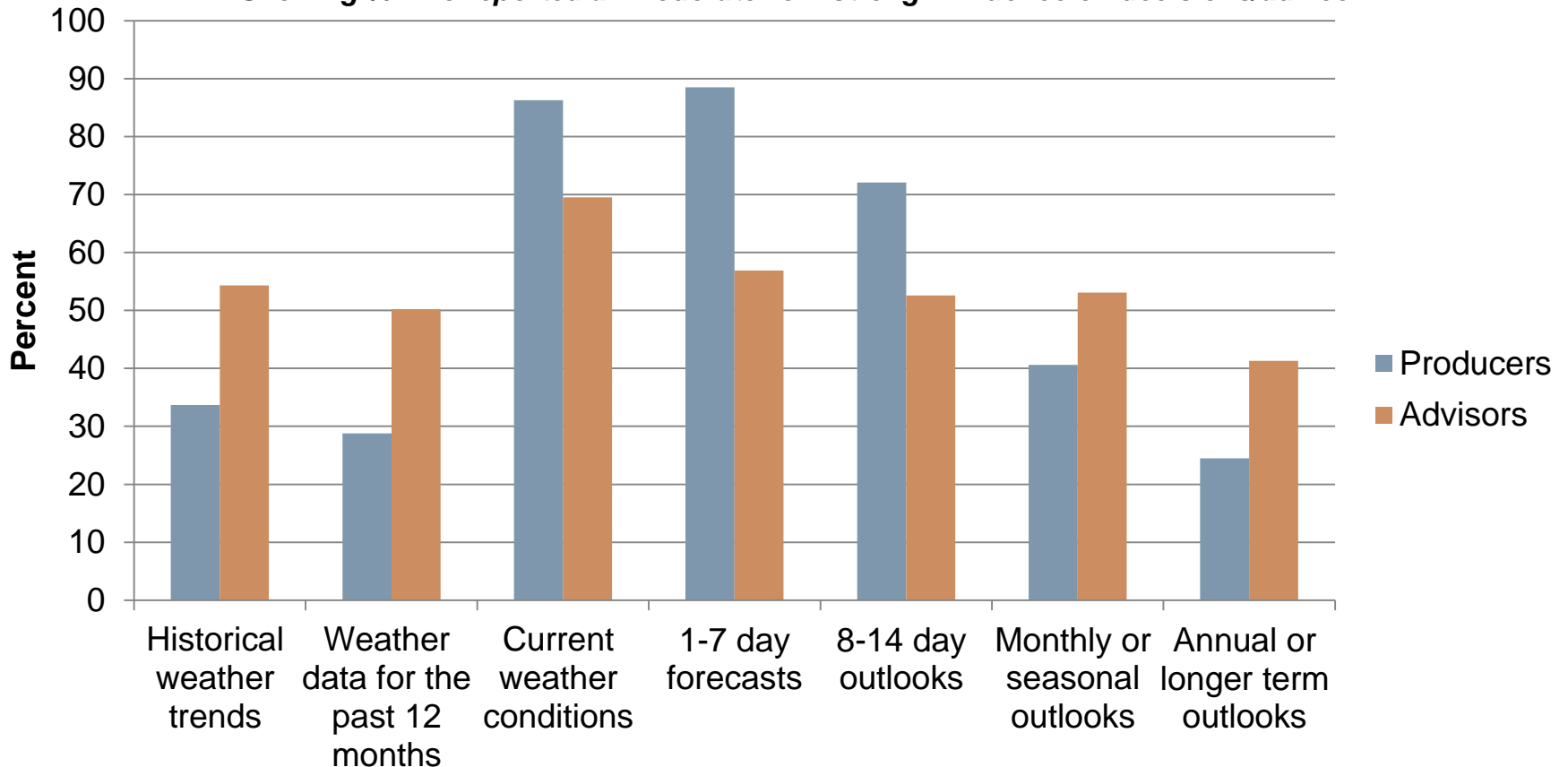




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Historical and future climate info is underutilized

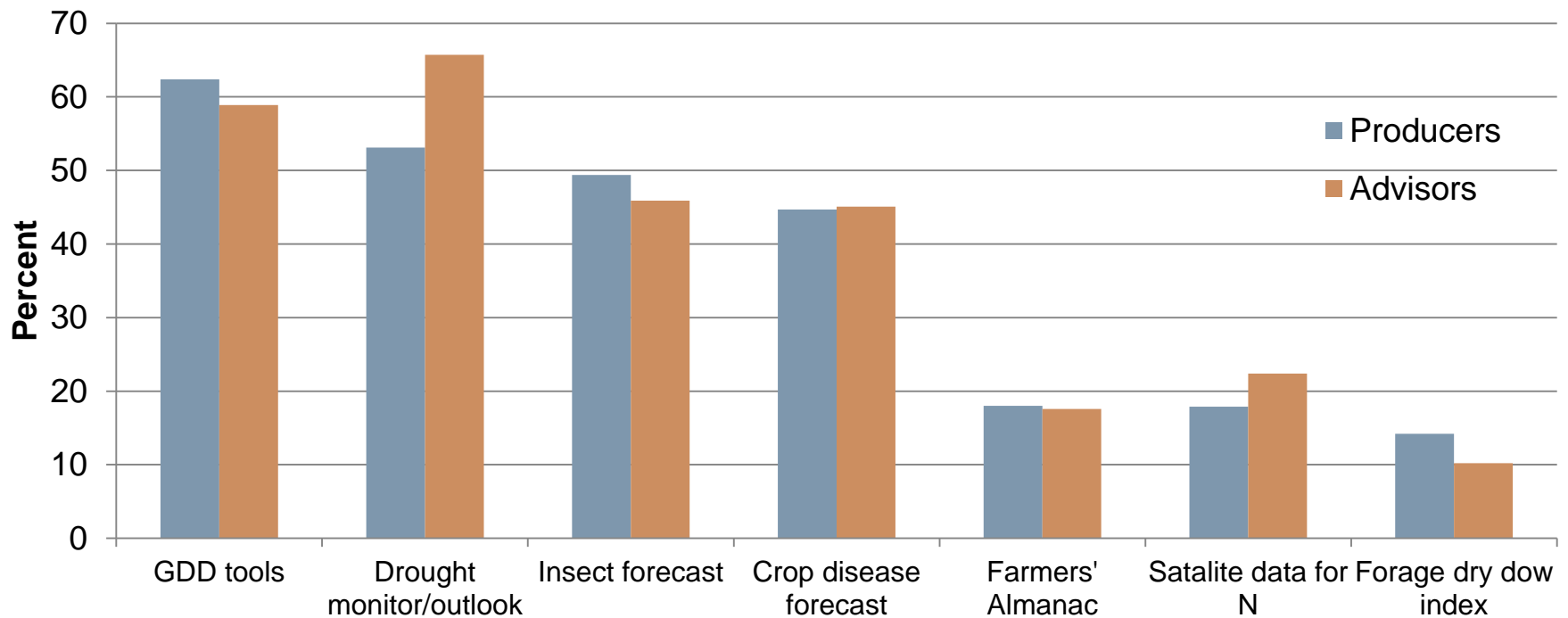
Showing % who reported a “moderate” or “strong” influence on decisions/advice





Mixed use of decision support resources

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





Advisors do see value in climate info for ag

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

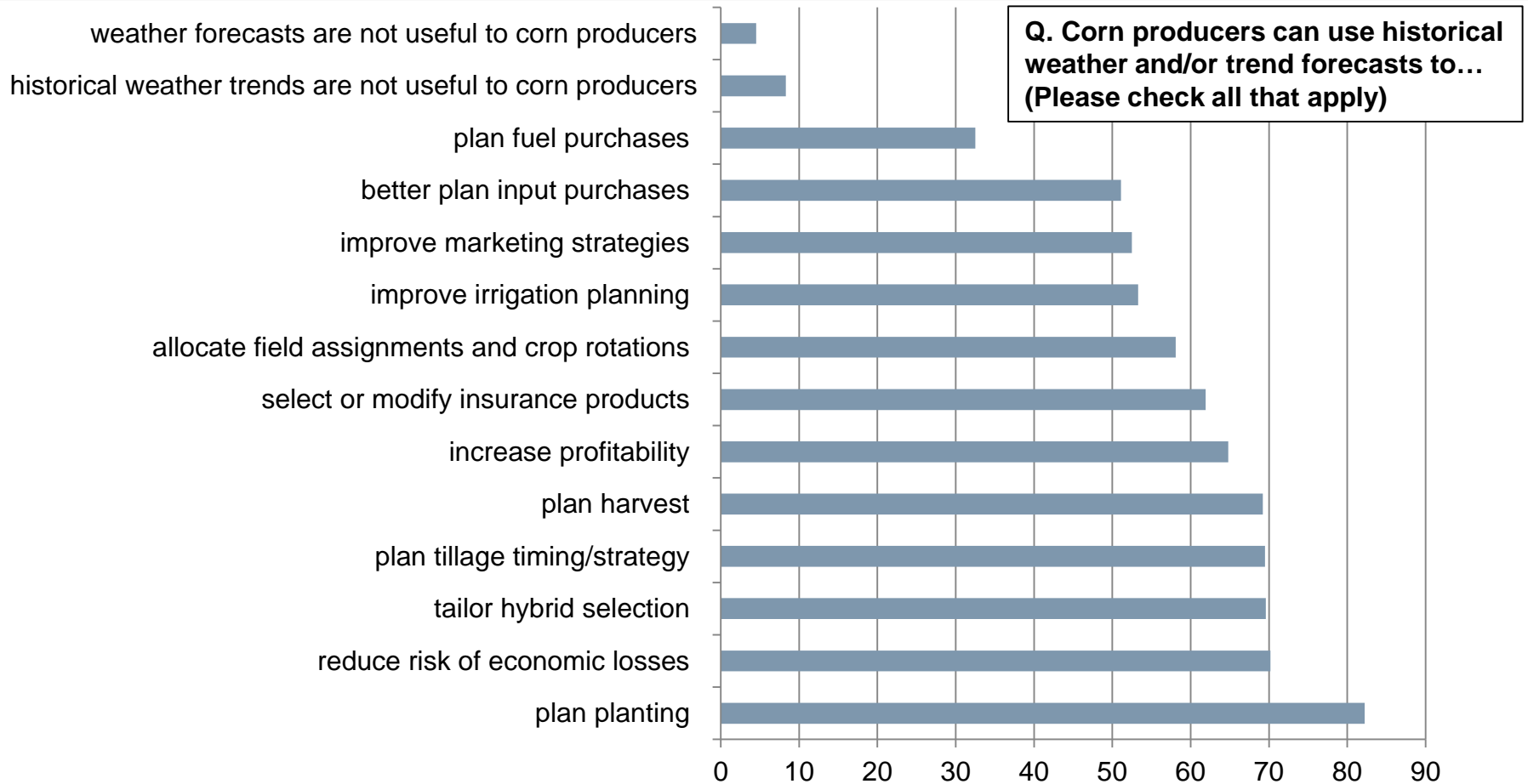
- Disagree/Strongly Disagree = 23%
- Uncertain = 45%
- Agree/Strongly Agree = 32%

“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





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

Climate change beliefs are diverse, and they matter!

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

Climate change beliefs are diverse, and they matter!

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

Climate change beliefs are diverse, and they matter!

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

Climate change beliefs are diverse, and they matter!

	Producers	Advisors	U2U
Climate change is occurring, and it is caused <u>mostly</u> by <u>human activities</u>	8%	12.6%	69%
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Climate change is <u>not occurring</u>	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.

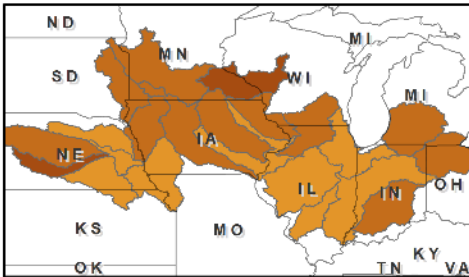


Perceived Behavioral Control

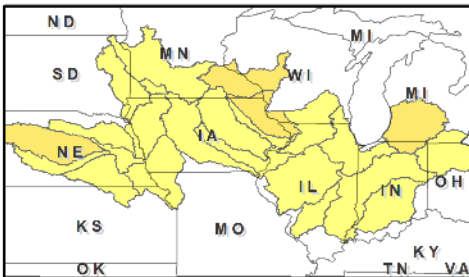
Seed Purchase



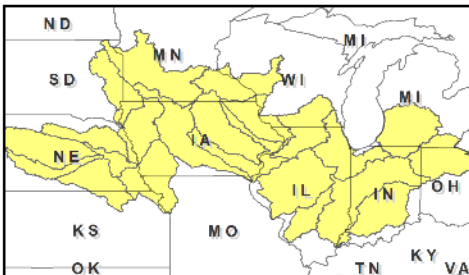
D/J/F



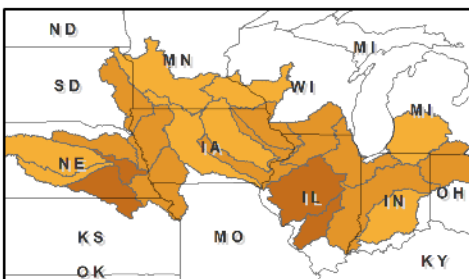
M/A/M



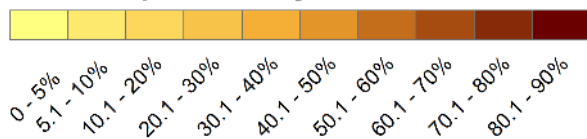
J/J/A



S/O/N



Percent of producers, by HUC6 watershed



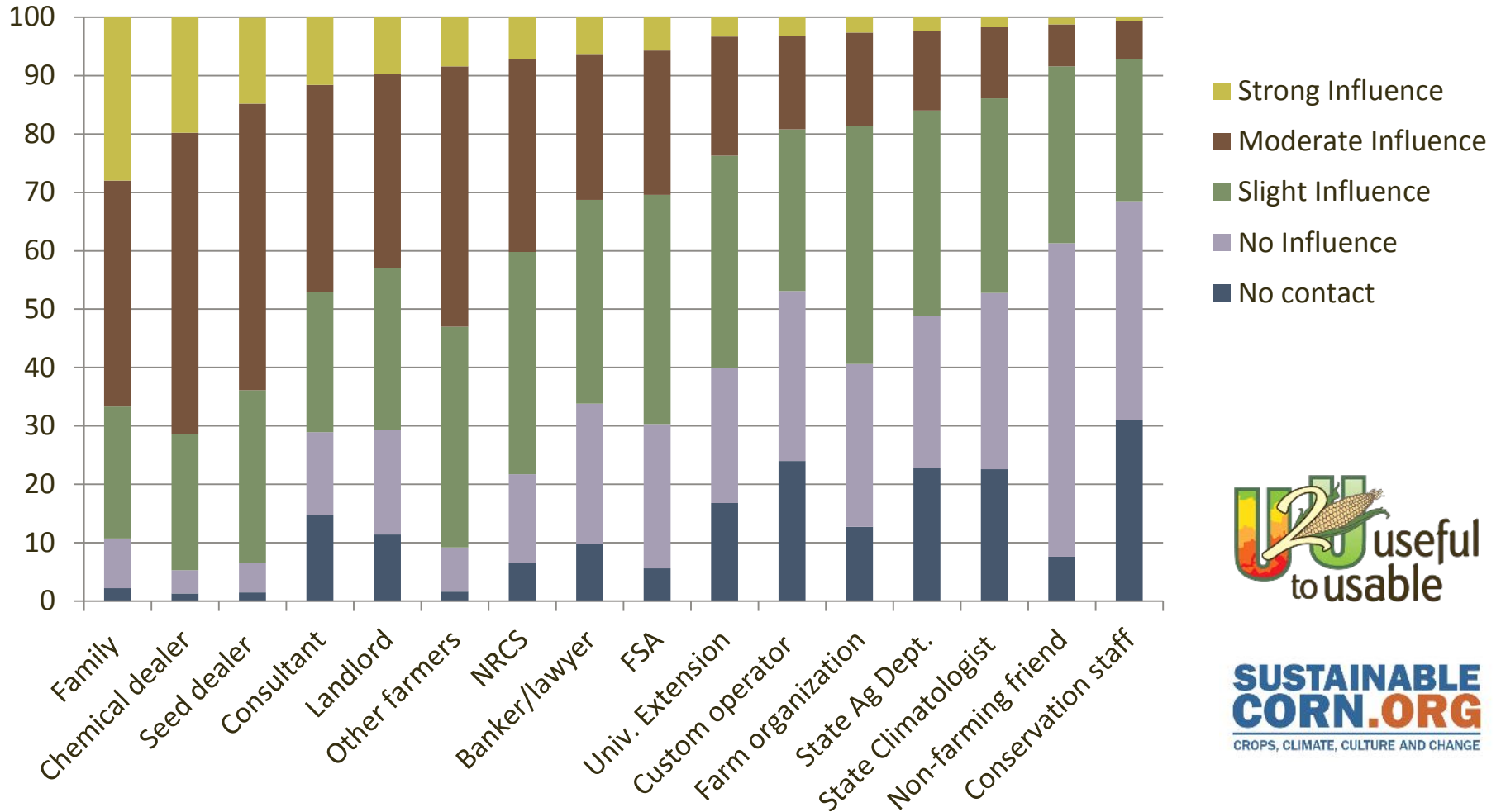
When can climate information influence a decision making process?

- 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)



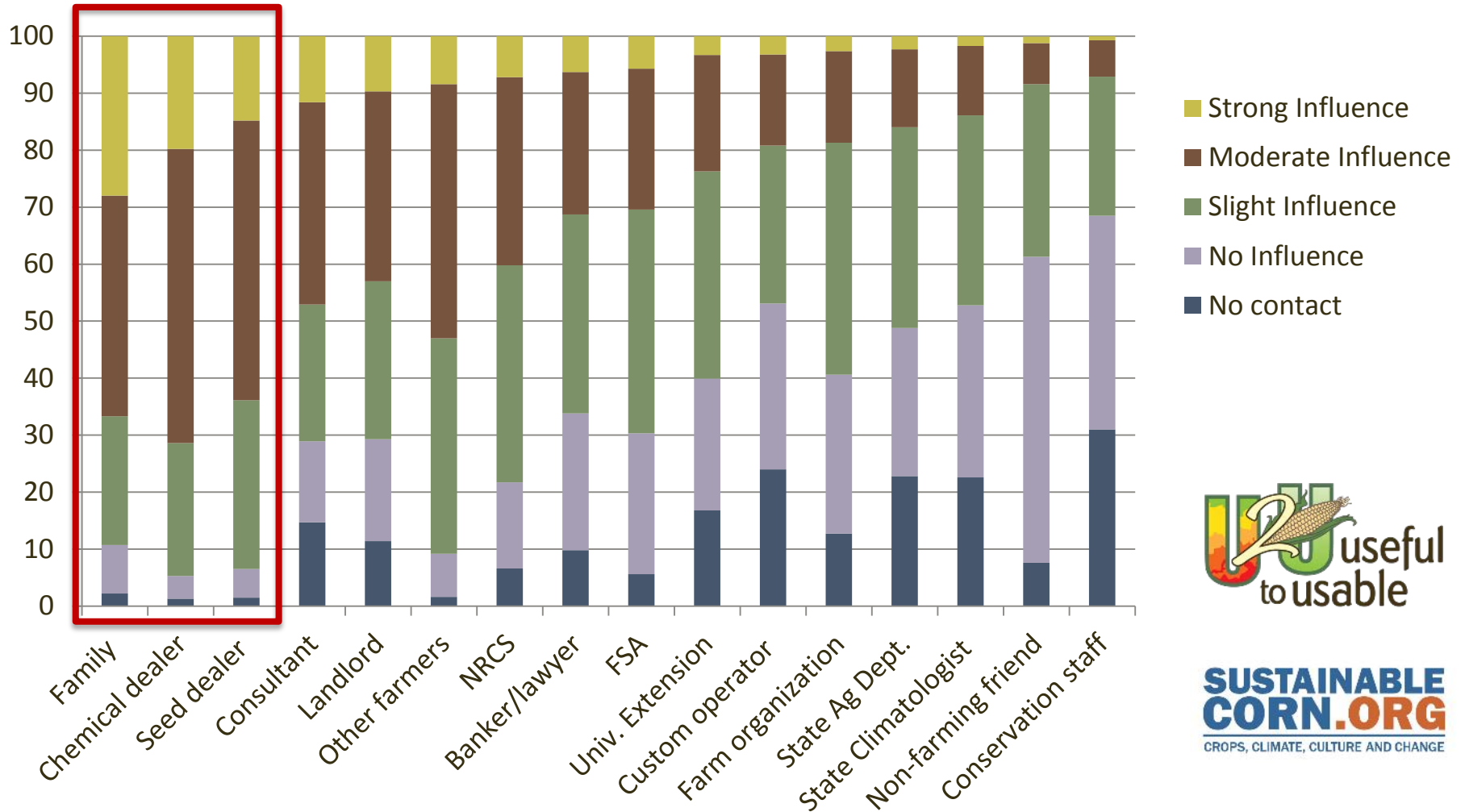
Social Norms

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



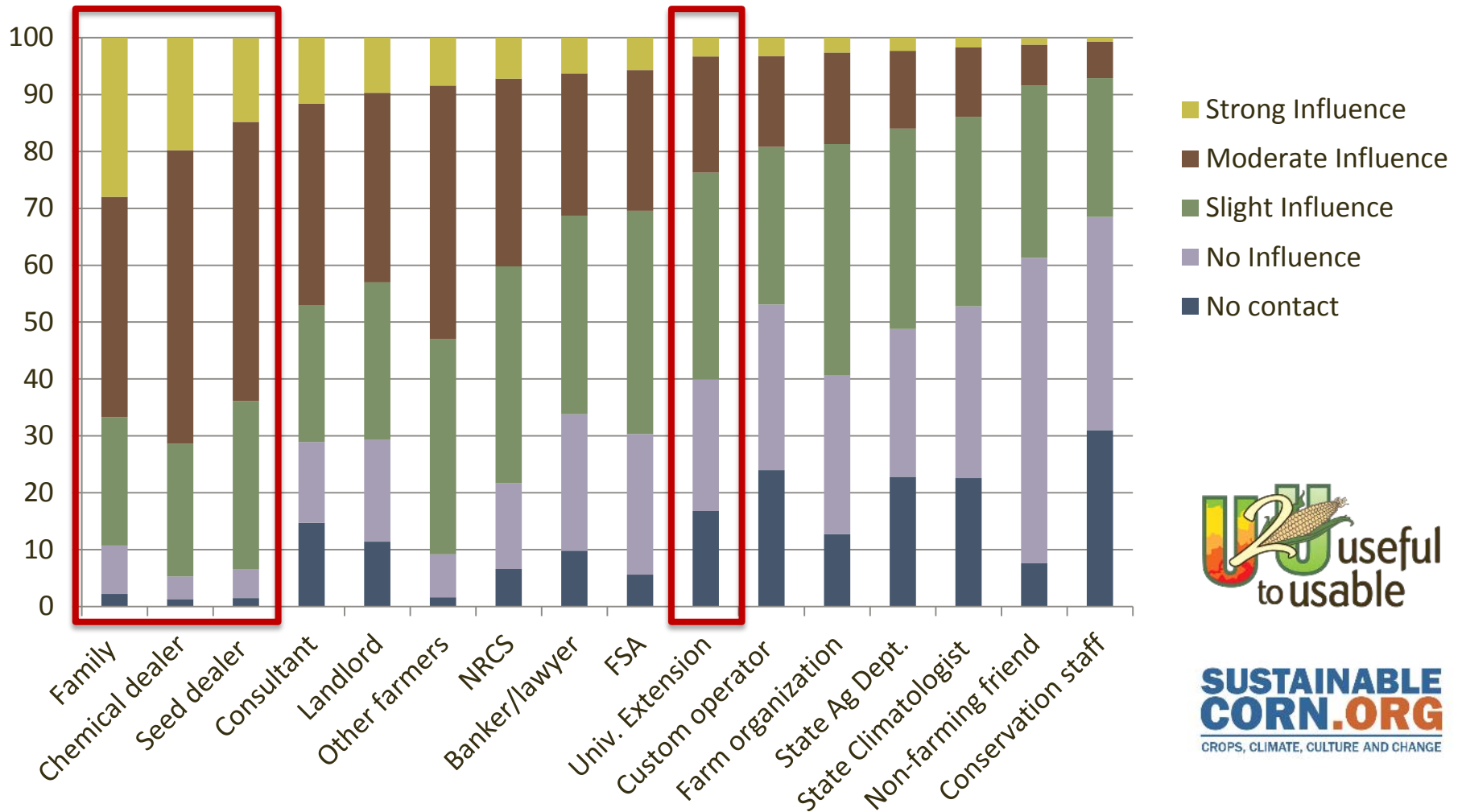
Results from a 2012 survey of Midwestern corn producers conducted by Useful to Usable (U2U) and SustainableCorn.org

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

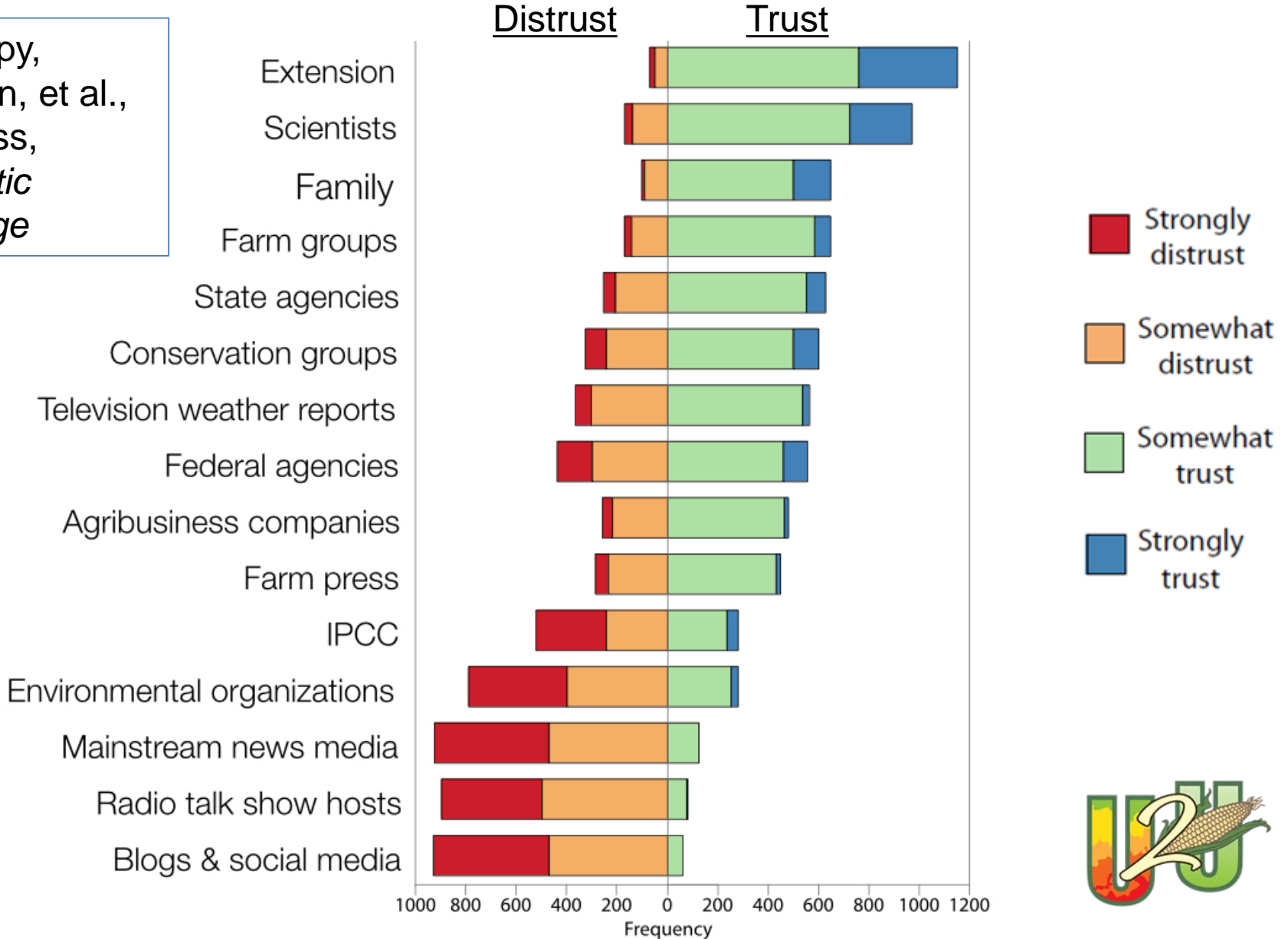
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Results from a 2012 survey of Midwestern corn producers conducted by Useful to Usable (U2U) and SustainableCorn.org

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!

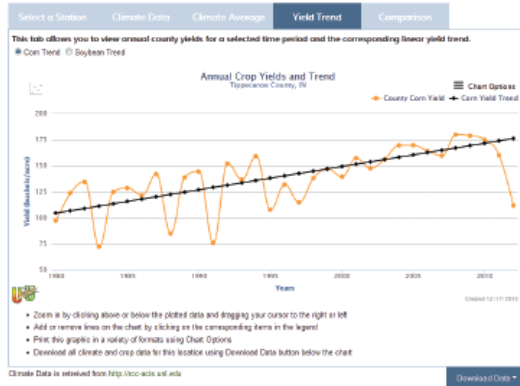
AVAILABLE NOW



AgClimate4U.org

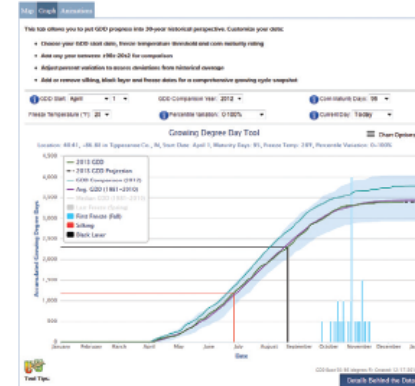
AgClimate View_{DST}

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



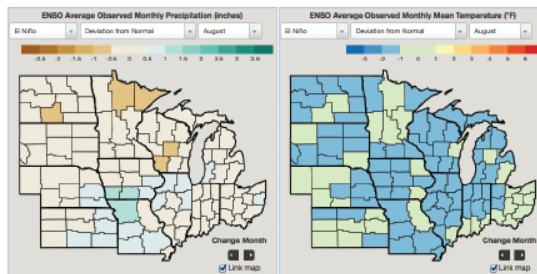
Corn GDD_{DST}

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



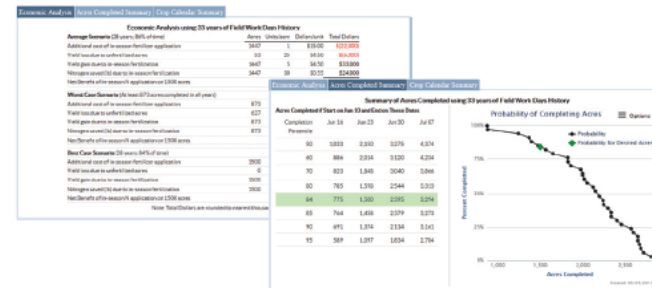
Climate Patterns Viewer_{DST}

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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AgClimate4U.org

Blog: AgriClimateConnection.org

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