The effects of the 2012 drought on climate change belief, risk perception, and adaptation among agricultural advisors in the US Corn Belt

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Department of Forestry & Natural Resources
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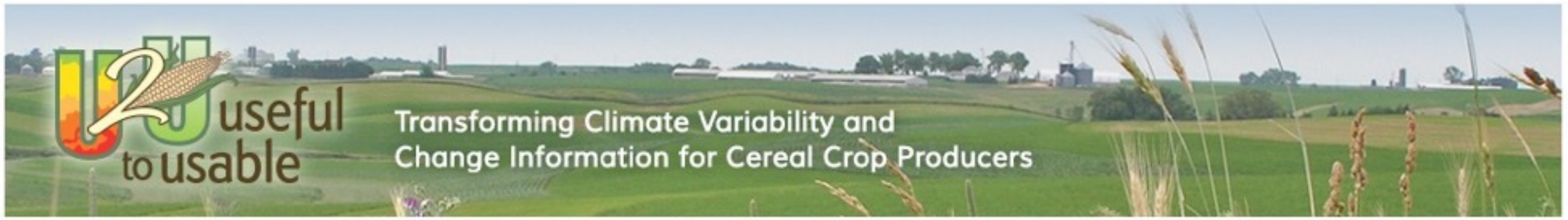
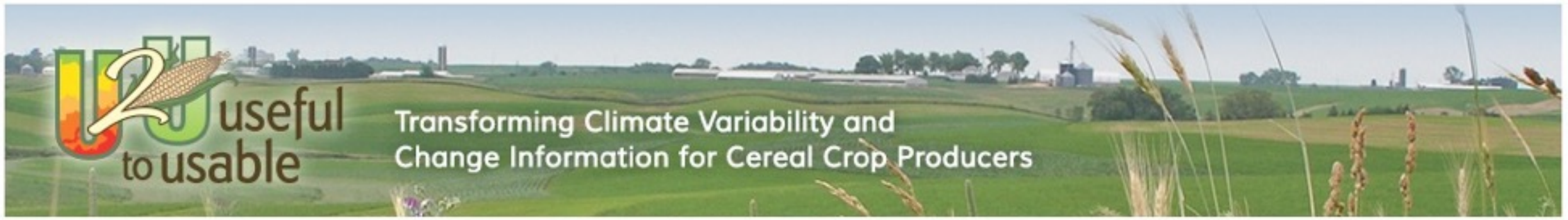


The problem of climate change adaptation

People are hard-wired not to worry about climate change.

Photo: Marsel Van Oosten



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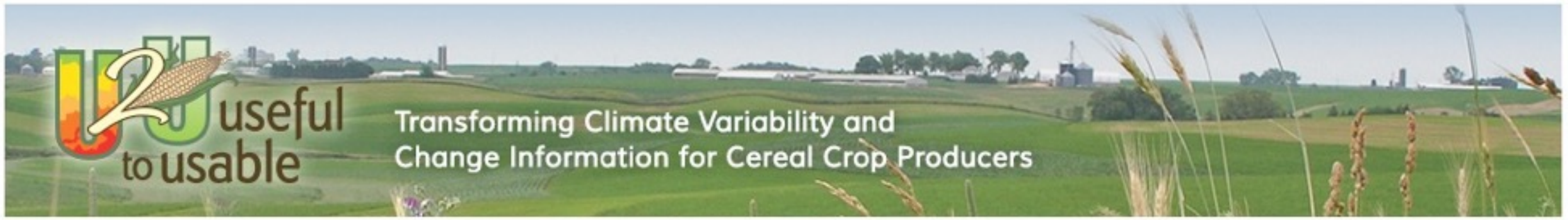
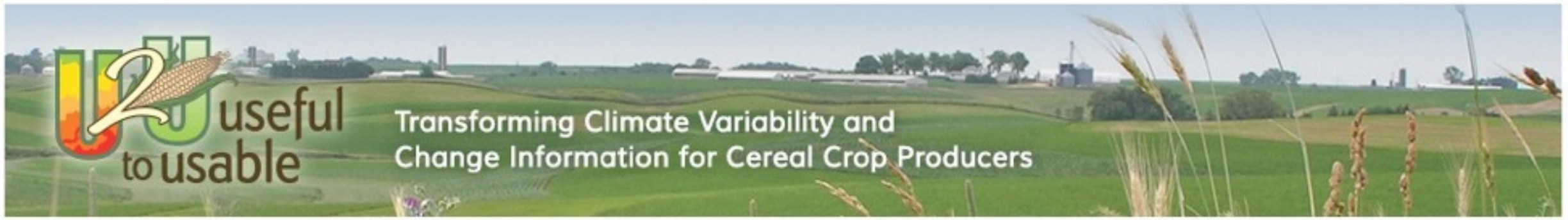


The problem of climate change adaptation

What if climate change were personal?



U2U Team

State climatologists, Crop modelers, Agronomists,
Economists, Social scientists, RCC staff

PURDUE UNIVERSITY

IOWA STATE UNIVERSITY
OF SCIENCE AND TECHNOLOGY

MICHIGAN STATE UNIVERSITY

ILLINOIS

SDSU

MICHIGAN

MU

University of Nebraska Lincoln

UW Extension
Cooperative Extension

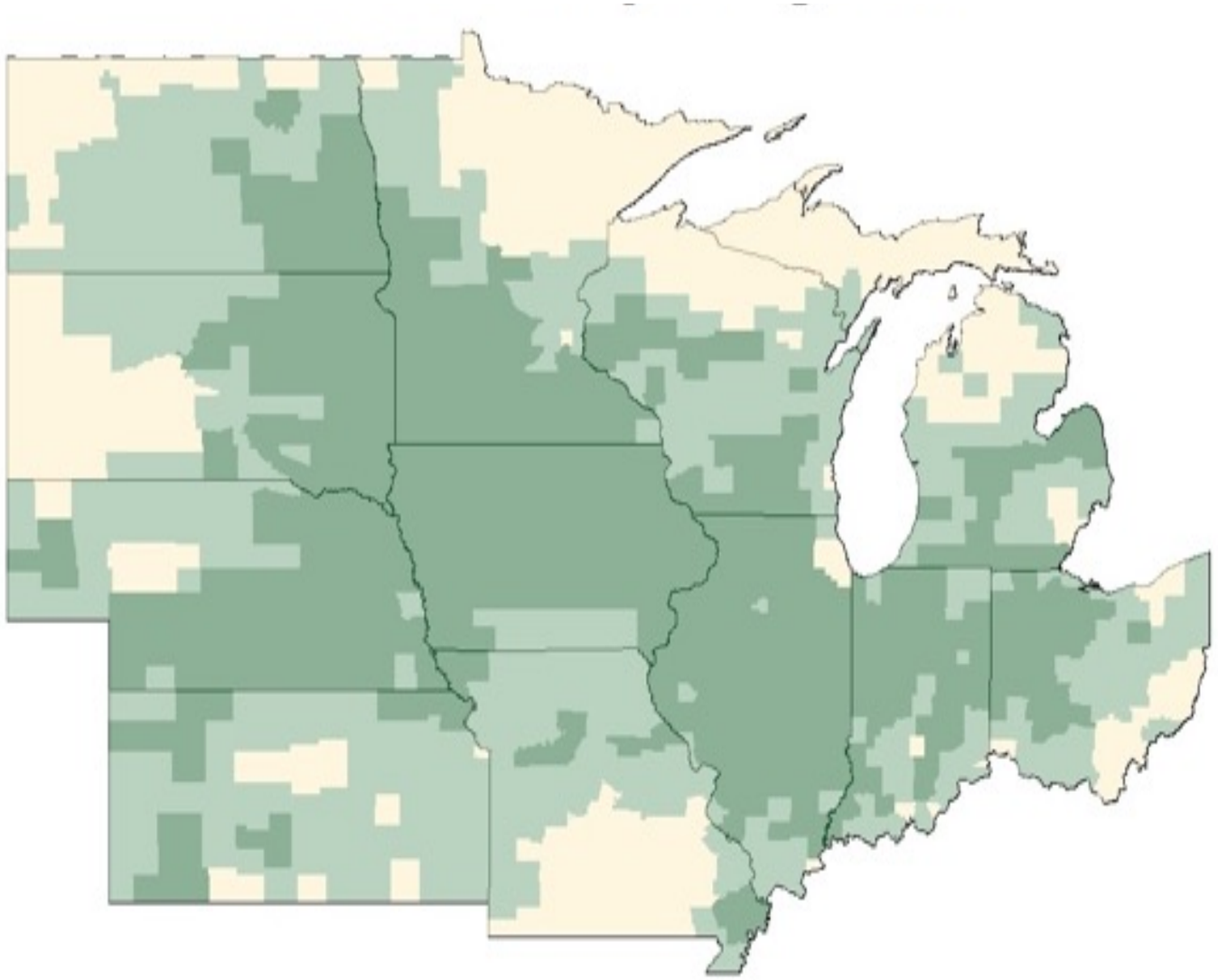
High Plains Regional Climate Center

MRCC
Midwestern Regional Climate Center

National Drought Mitigation Center

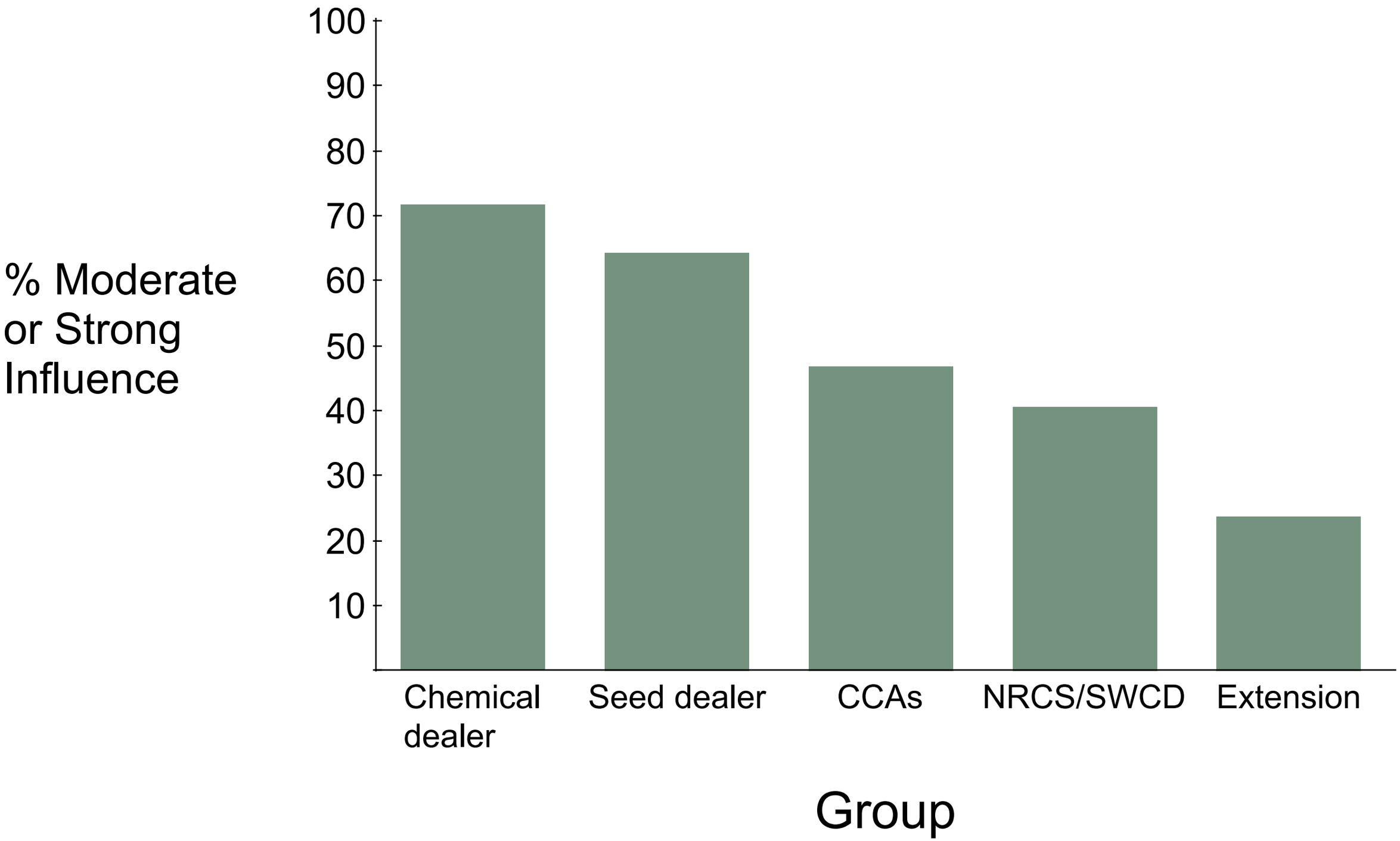
Transforming Climate Variability and Change Information for Cereal Crop Producers

U.S. Corn Belt



- Nearly one-third of global supply
- Over $50B to US economy

Agricultural Advisors: key players in the corn industry



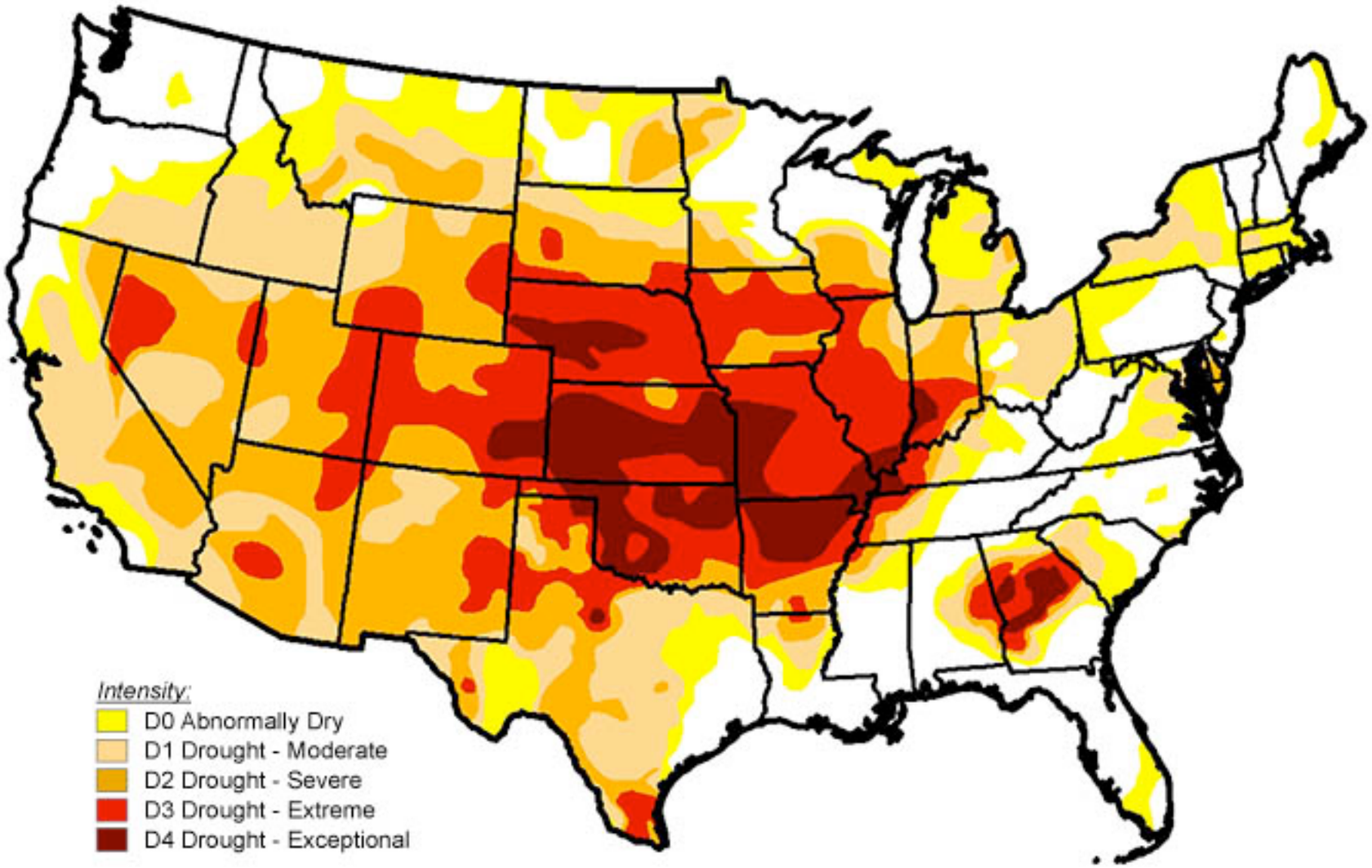
Source: Prokopy et al. in preparation

Agricultural Advisors: 2012 Survey

2012 Advisor Survey:

- Climate Change Beliefs
- Risk Perceptions
- Willingness to use climate information

The 2012 drought: a research opportunity



Credit: NDMC August 2012

The worst drought in 50+ years

Credit: Purdue University

Credit: UCAR

Credit: NDJMom

U2U useful to usable

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The 2012 drought: a research opportunity

Did this extreme event influence climate beliefs?

Background

Whitmarsh: Flooding in England


PA

Agricultural Advisors: 2012 Survey

Unprecedented baseline data

Agricultural Advisors: 2012 Survey

2012 Advisor Survey:

- Climate Change Beliefs
- Risk Perceptions
- Willingness to use climate information

Agricultural Advisors: 2013 Survey

2013 Advisor Survey:

- Climate Change Beliefs
- Risk Perceptions
- Willingness to use climate information

Agricultural Advisors: 2013 Survey

3 hypotheses based on SARF and RAA:

H1: Belief in climate change will have increased

H2: Risk perceptions will have increased

H3: Willingness to use climate information will have increased

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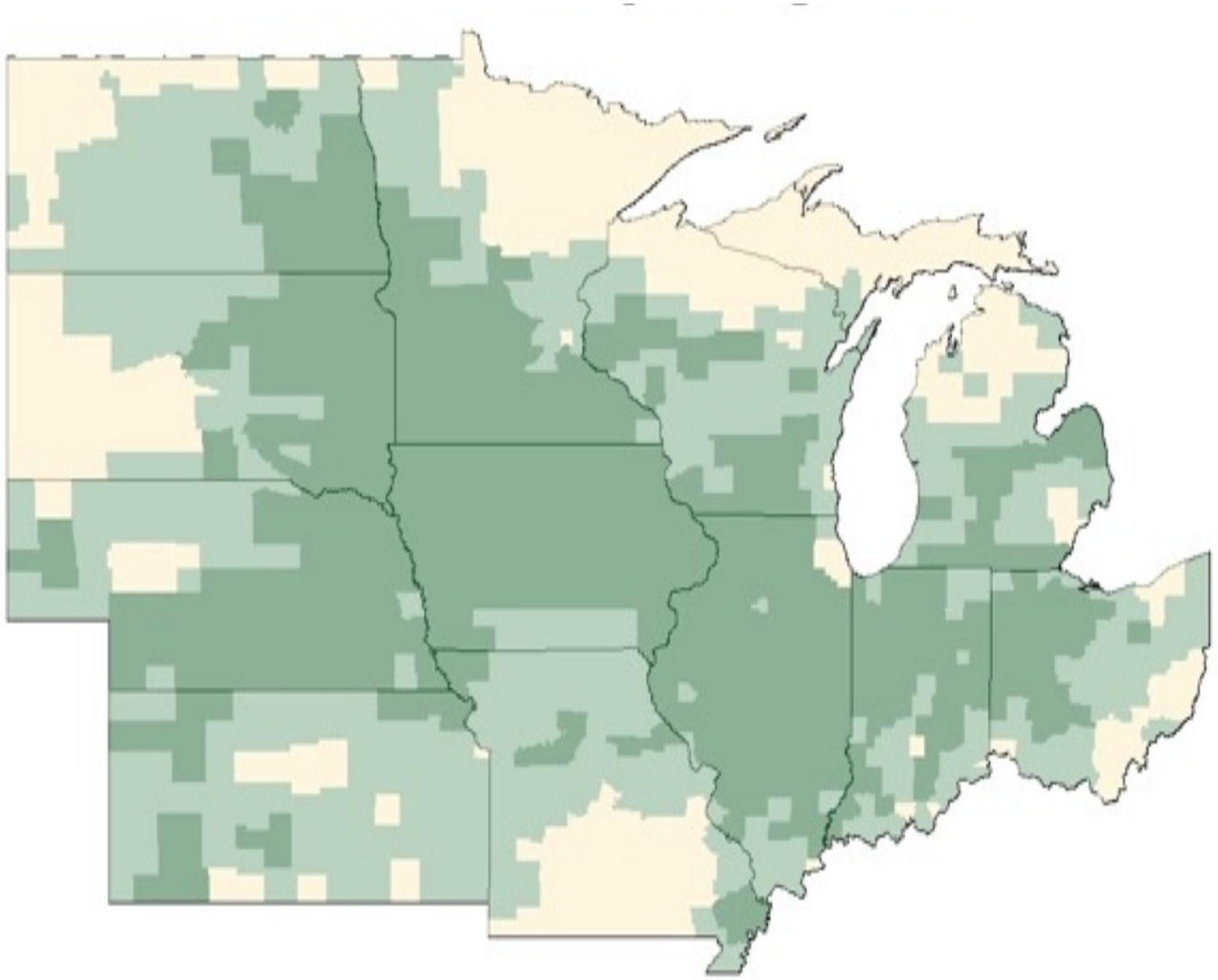
2013 Survey Methods

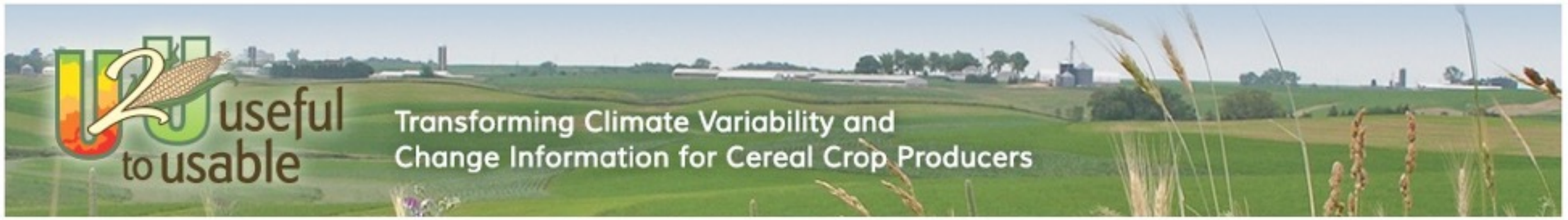
2013 Advisor Survey:

- Administered electronically to ~7500 advisors
- ~25% response rate
- 864 repeat respondents

U.S. Corn Belt



Survey administered in Indiana, Nebraska, Michigan, Iowa

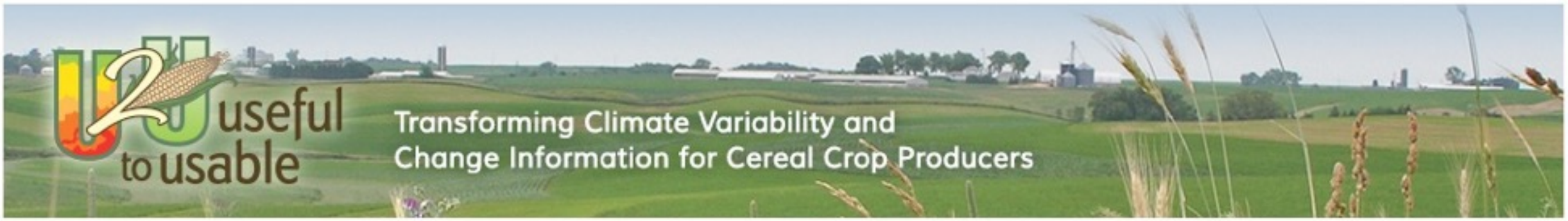


Agricultural Advisors: 2013 Survey

H1: Belief in climate change will have increased

H1: Belief in climate change will have increased

- Climate change is occurring, and it is **caused mostly by natural changes** in the environment
- 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 **not occurring**
- **There is not sufficient evidence** to know with certainty if climate change is occurring or not



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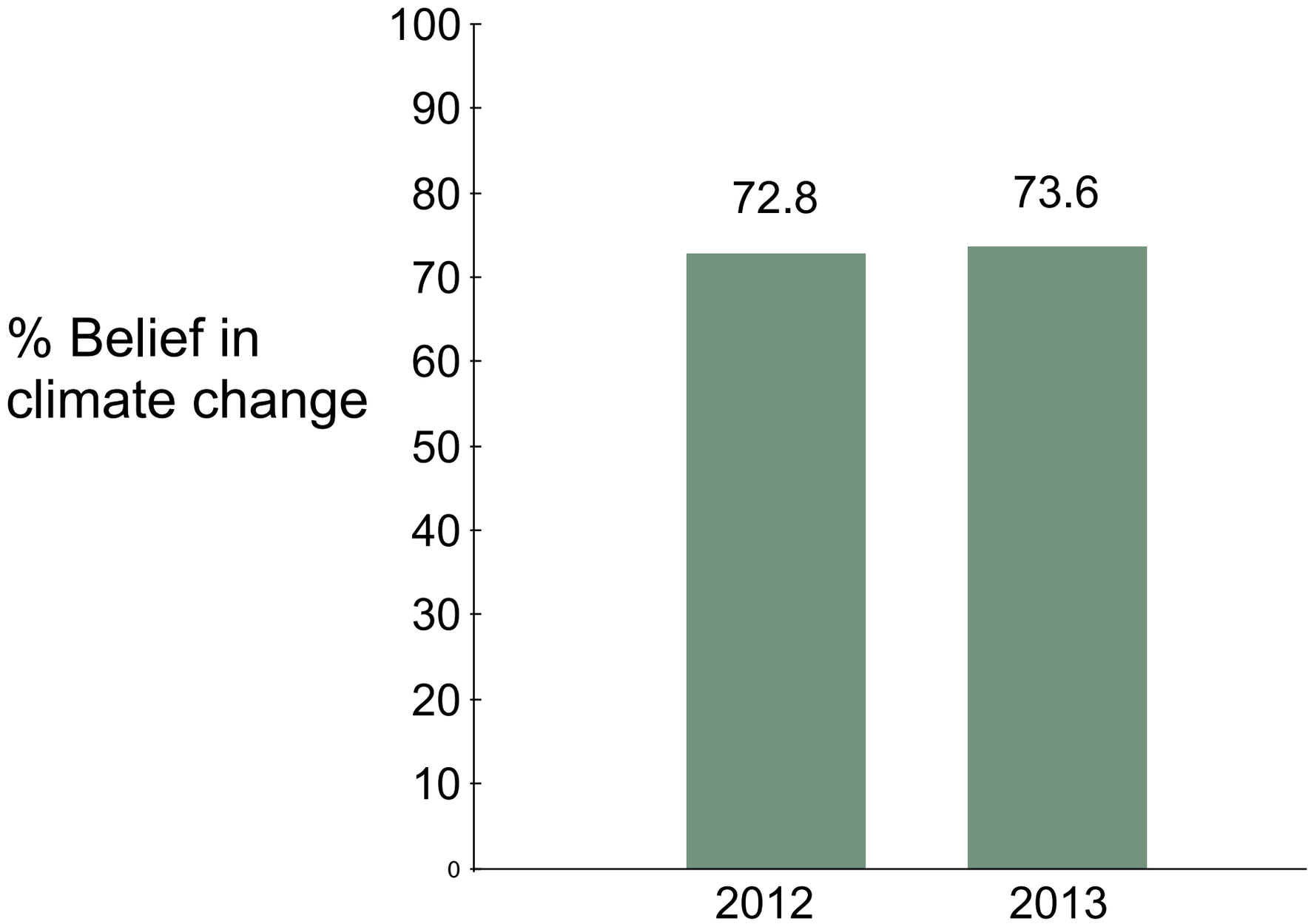


Belief in climate change didn’t change

Agricultural Advisors: 2013 Survey

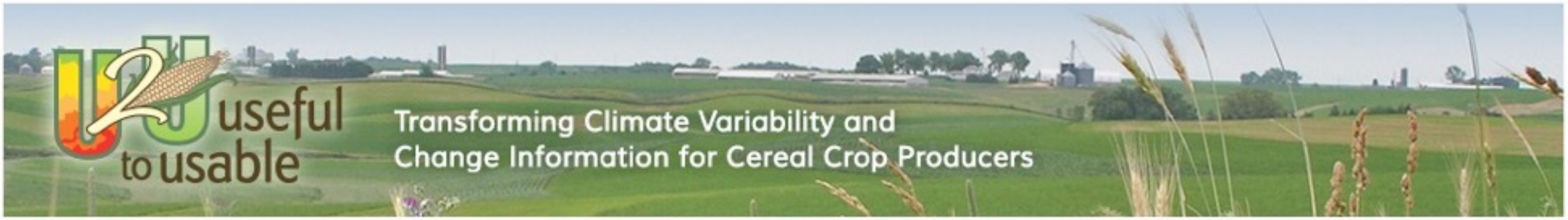
H1: Belief in climate change will have increased

Agricultural Advisors: 2013 Survey

H1: Belief in climate change **didn’t** change.

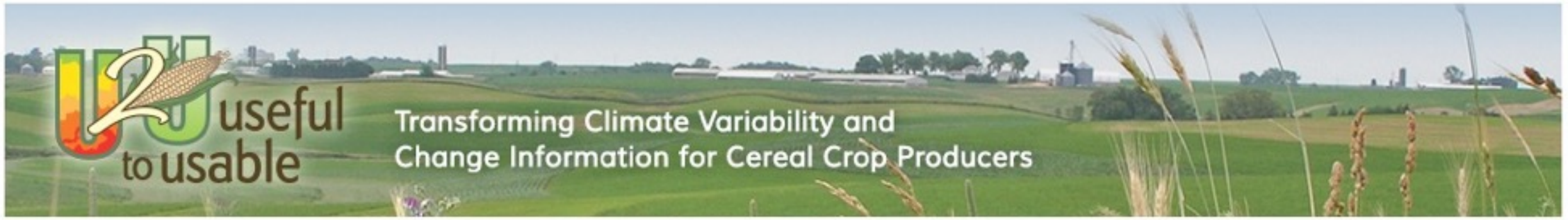
Agricultural Advisors: 2013 Survey

H2: Risk perceptions associated with climate change will have increased.



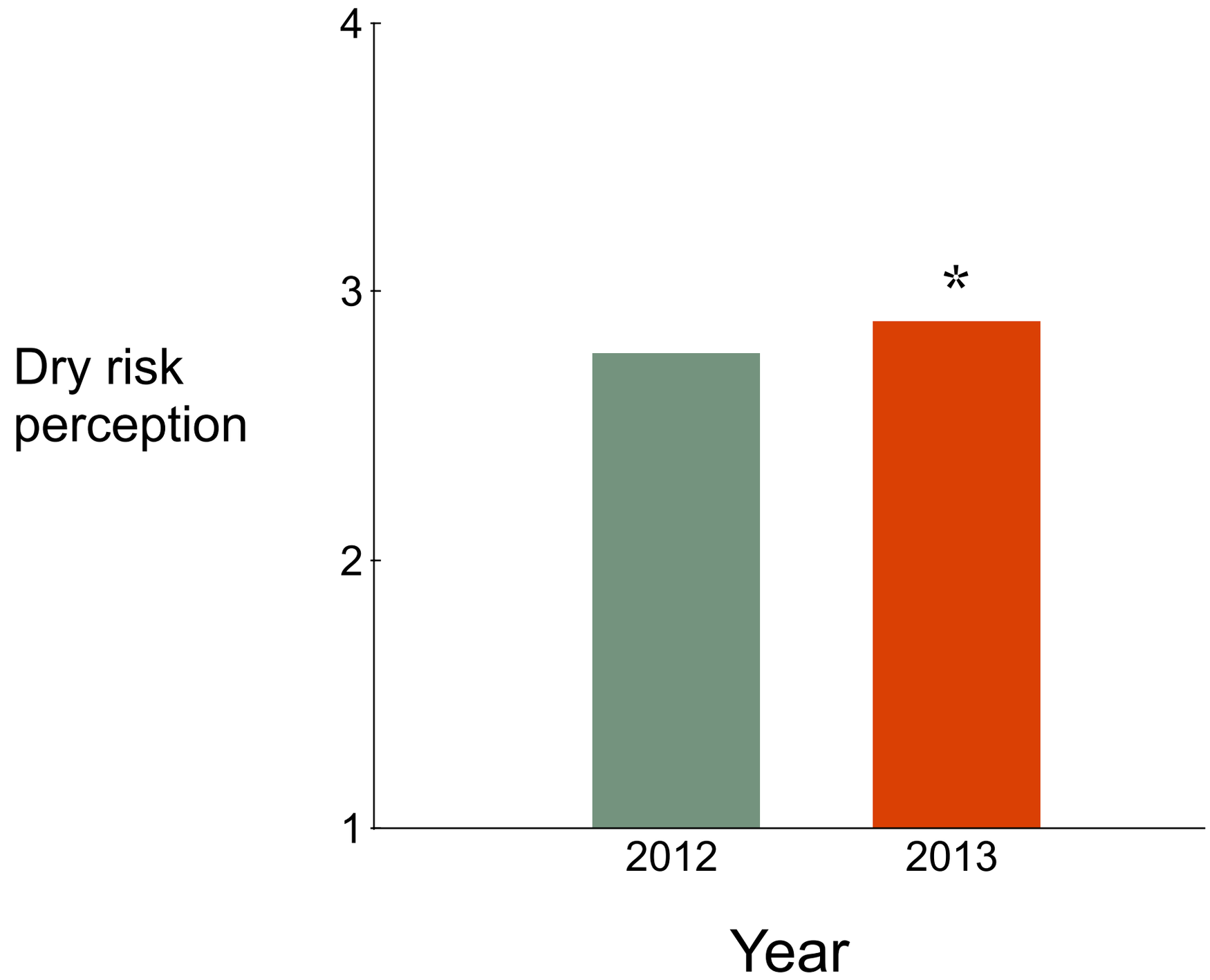
H2: Risk perceptions will have increased.

floods	drought	weeds
rain	heat	insects
ponding		disease
nutrient runoff		

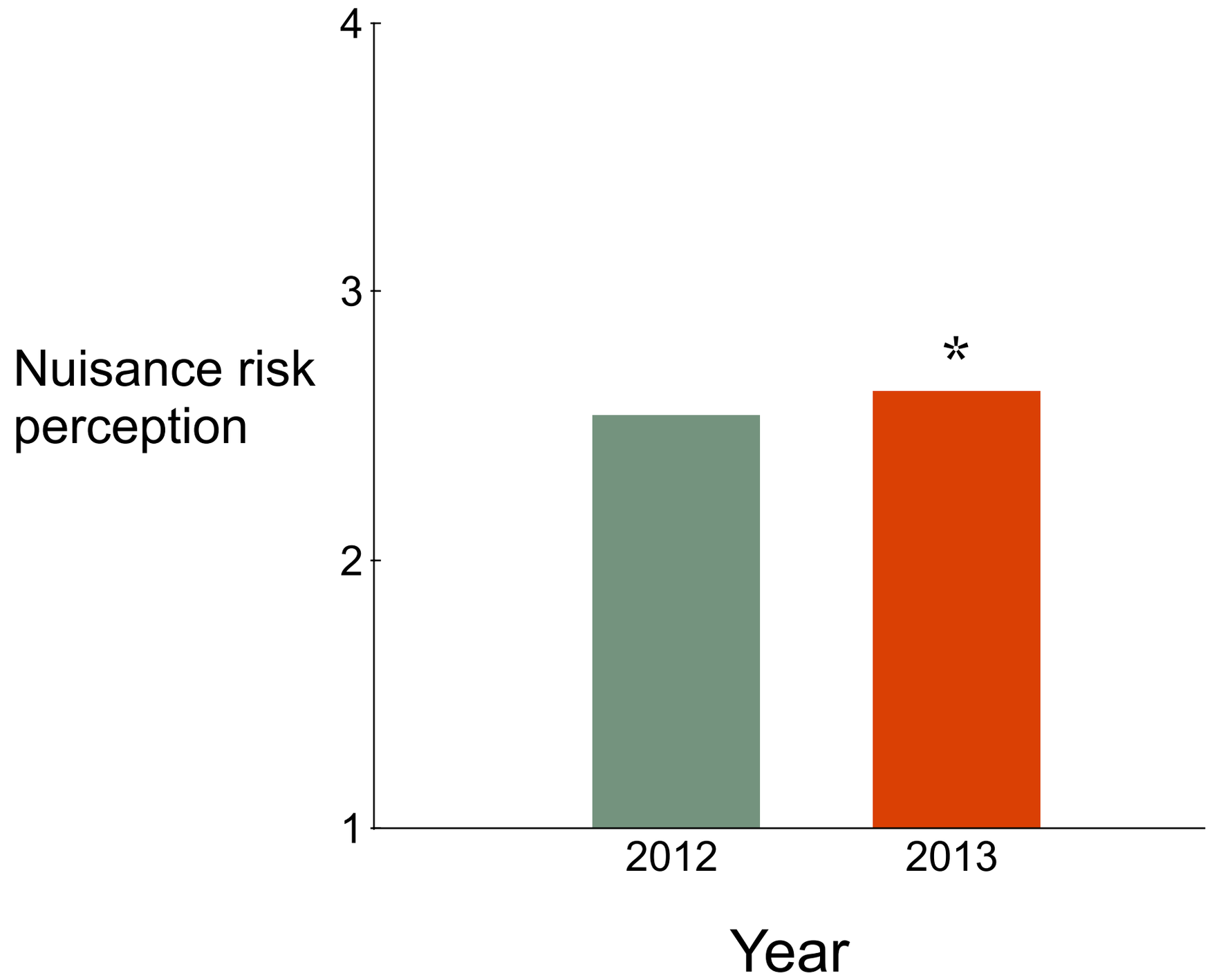


H2: Risk perceptions will have increased.

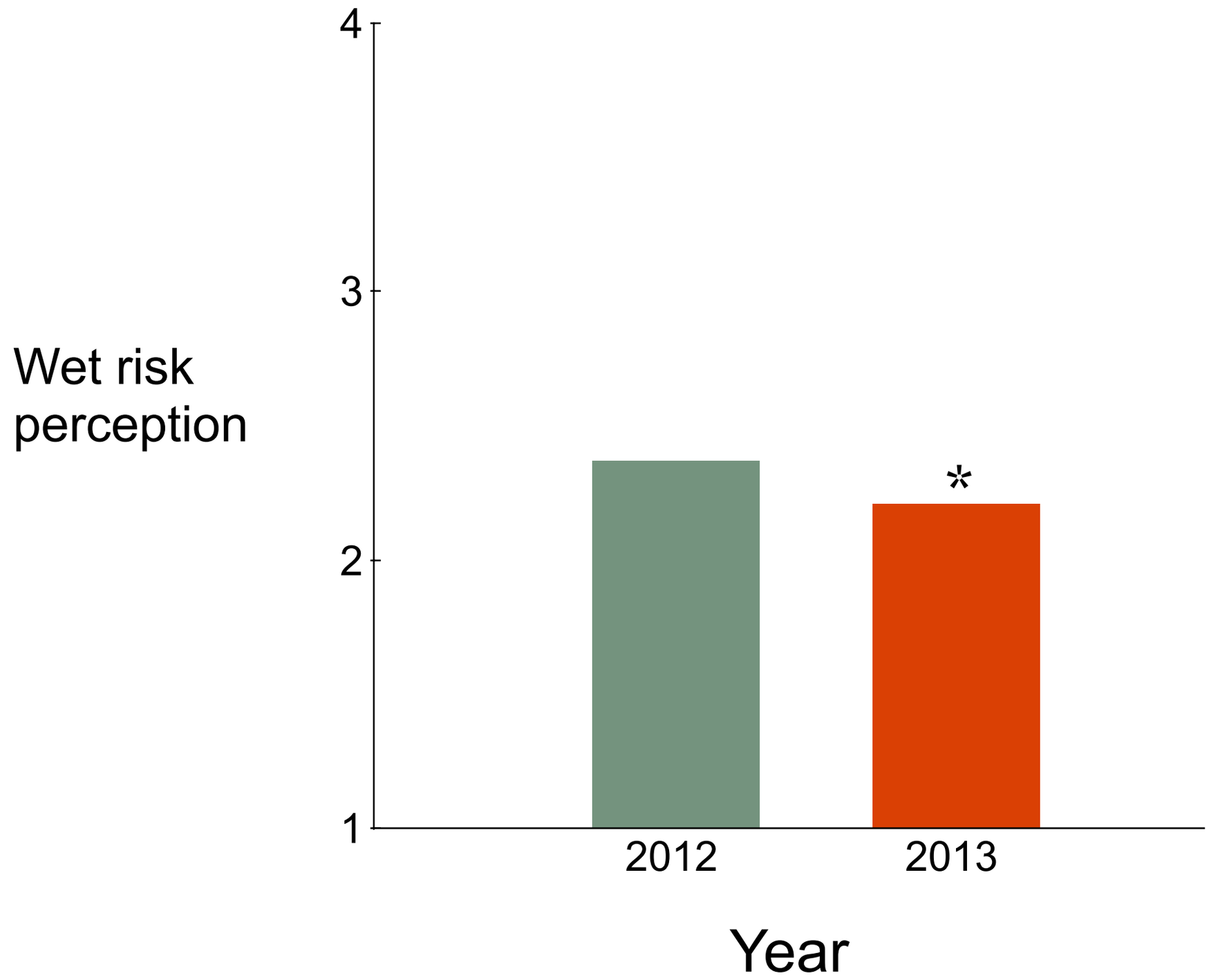
Wet Risks	Dry Risks	Nuisance Risks
floods	drought	weeds
rain	heat	insects
ponding		disease
nutrient runoff		



Dry risk perception *increased* after the drought.



Nuisance risk perception *increased* after the drought.



Wet risk perception *decreased* after the drought.

Agricultural Advisors: 2013 Survey

H2: Risk perceptions associated with climate change will have increased.

Agricultural Advisors: 2013 Survey

H2: Risk perceptions associated with climate change ~~will have increased~~ **changed**.

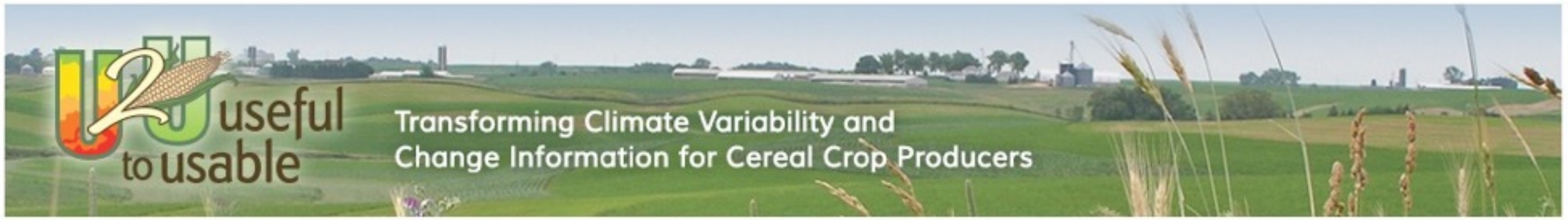
Agricultural Advisors: 2013 Survey

H1: Belief in climate change did not change

H2: Risk perceptions associated with climate change changed.

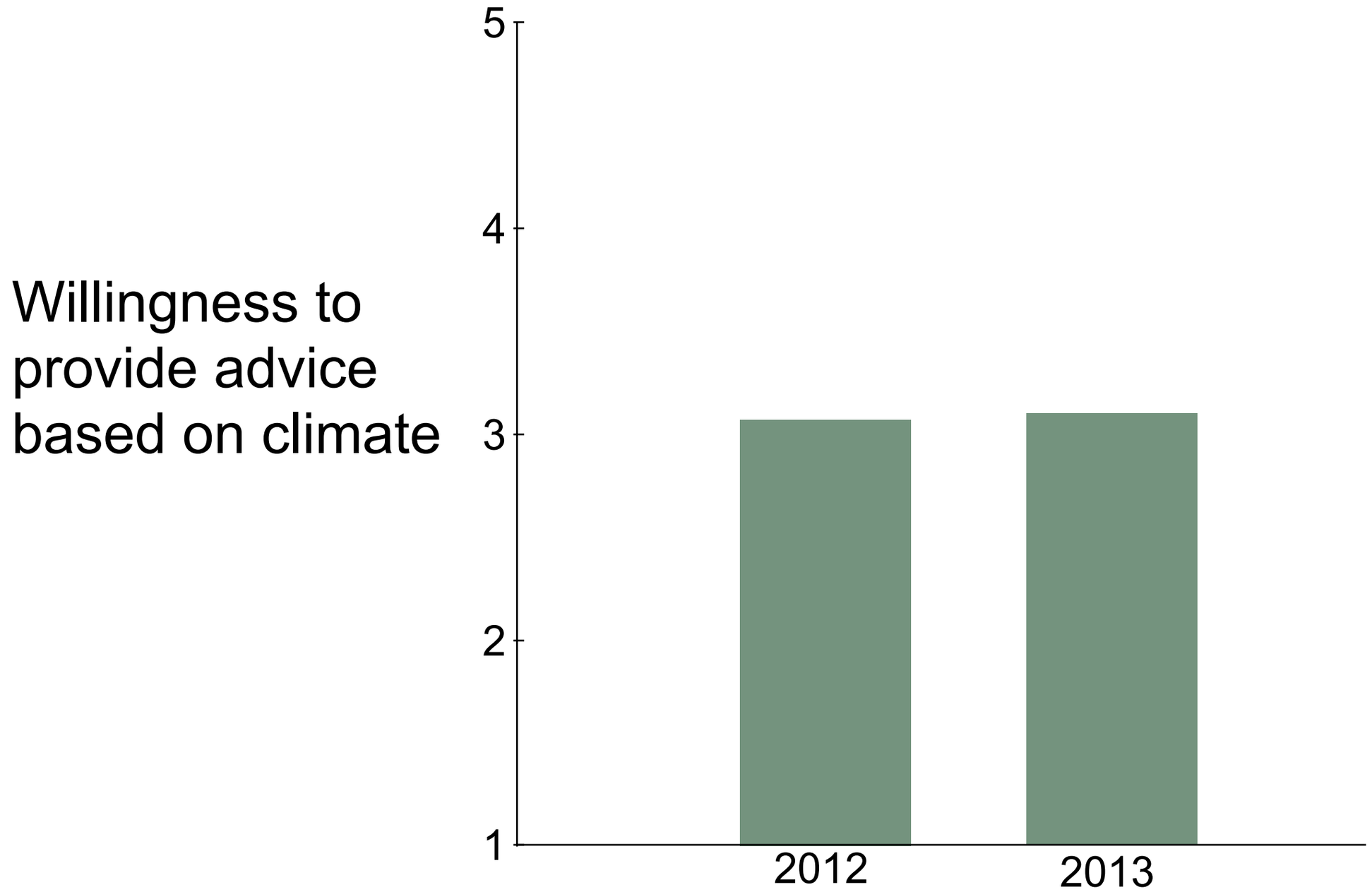
Agricultural Advisors: 2013 Survey

H3: Willingness to use climate information will have increased.



Agricultural Advisors: 2013 Survey

“I would like to provide advice based on climate information”



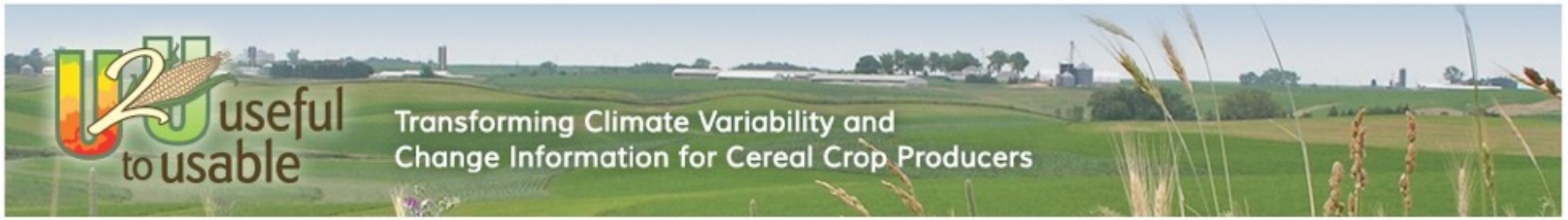
Willingness to provide advice based on climate forecasts didn’t change.

Agricultural Advisors: 2013 Survey

H3: Willingness to use climate information will have increased.

Agricultural Advisors: 2013 Survey

H3: Willingness to use climate information ~~will have increased~~. **did not increase**.



Agricultural Advisors: 2013 Survey

H3a: Willingness to use climate information will be influenced by perceived behavioral control, attitudes, and perceived norms as indicated by the Reasoned Action Approach

H3a measures

Perceived behavioral control: perceived ability to use climate information (2-question construct)

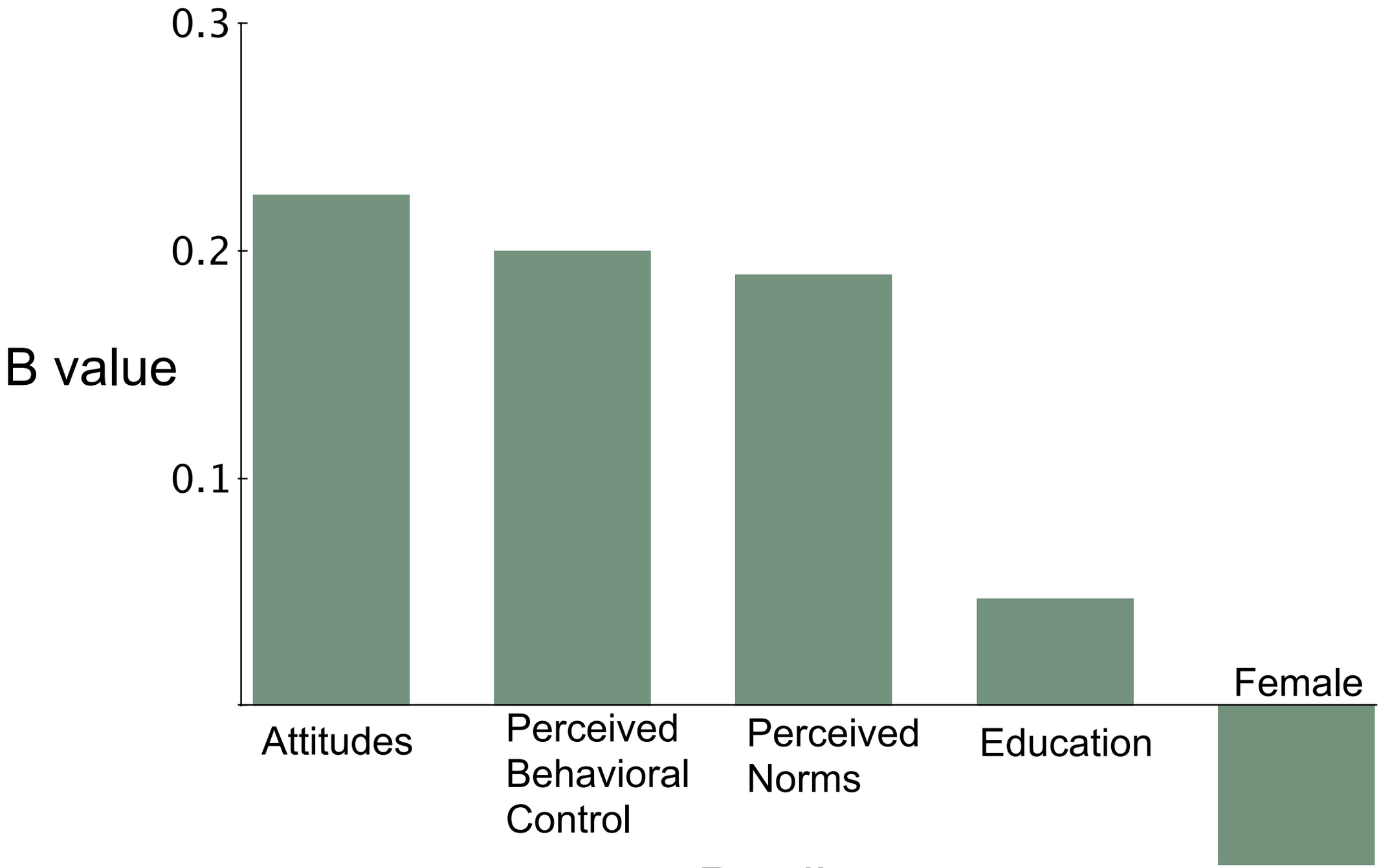
Attitudes: positive/negative feelings toward using climate information (3-question construct)

Perceived norms: influence of peers (2-question construct)

H3a model

Dependent variable: willingness to use climate information when providing advice to farmers.

Independent variables: attitudes, perceived behavioral control, perceived norms, education, gender



Willingness to use climate information significant predictors ($p<0.001$, $R^2=0.20$)

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Agricultural Advisors: 2013 Survey

H1: Belief in climate change did not change

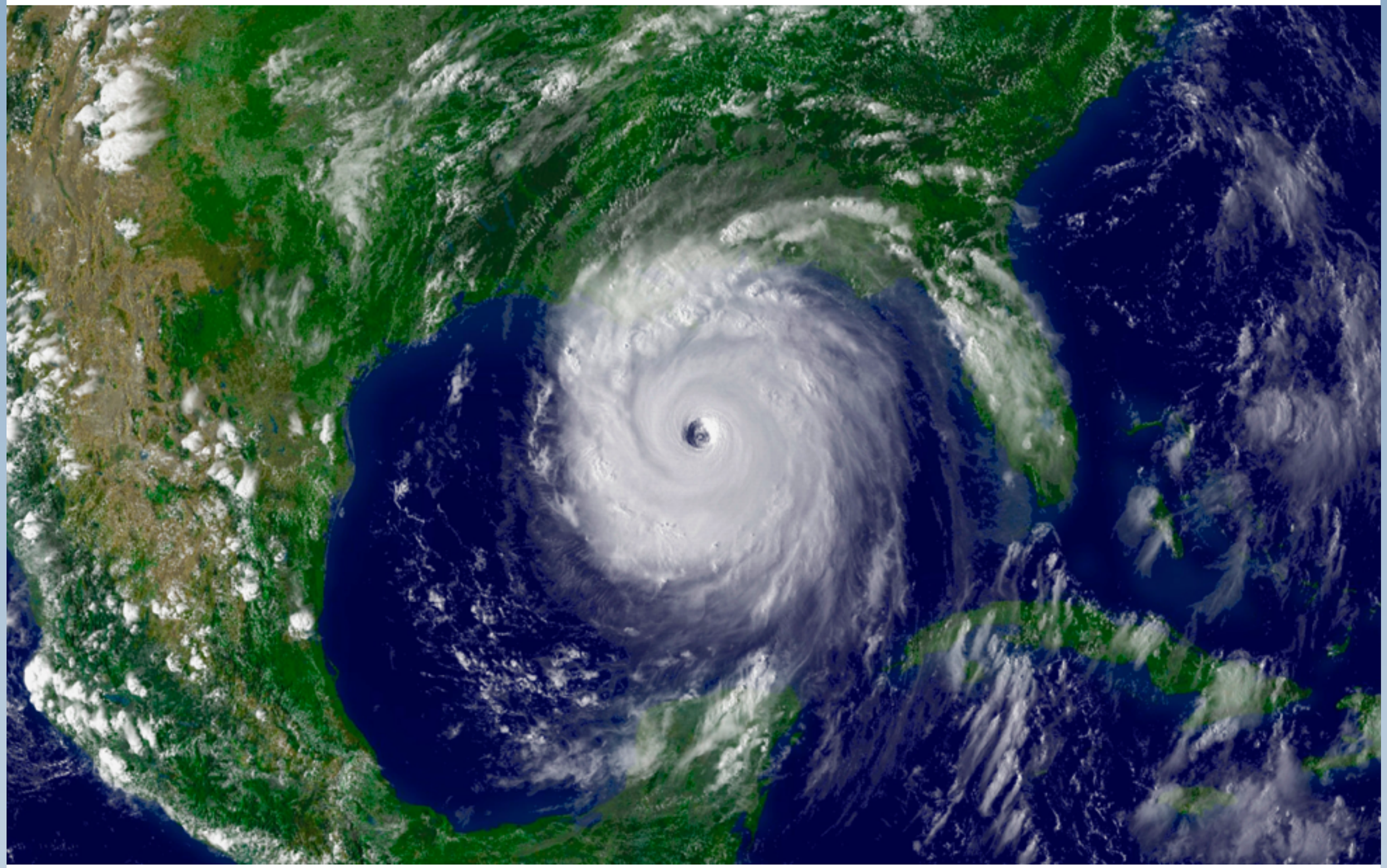
H2: Risk perceptions associated with climate change changed, largely based on perceived likelihood of future droughts.

H3: Willingness to use climate information when providing advice didn’t change but was predicted by RAA.

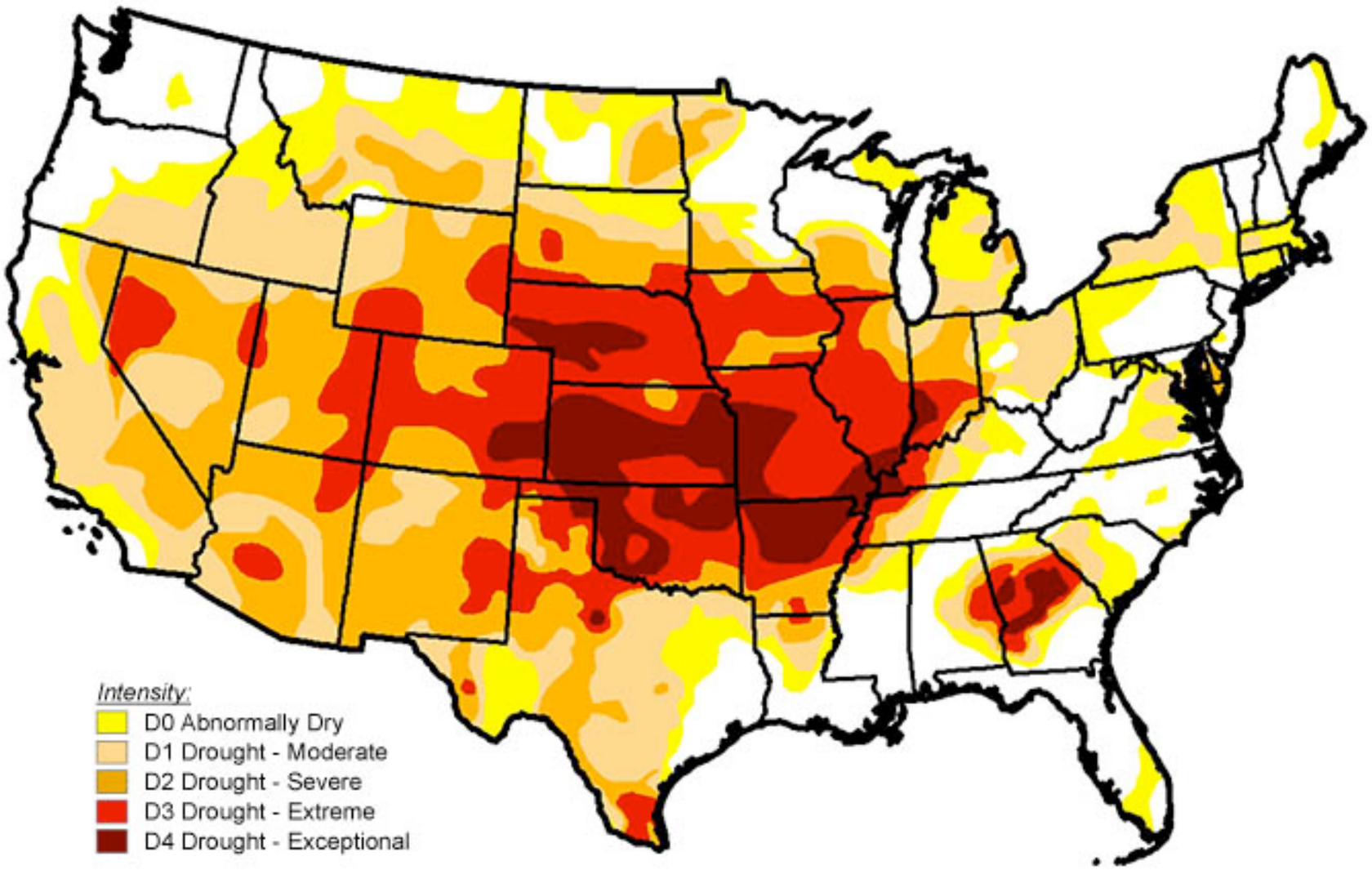
Conclusions

Conclusions

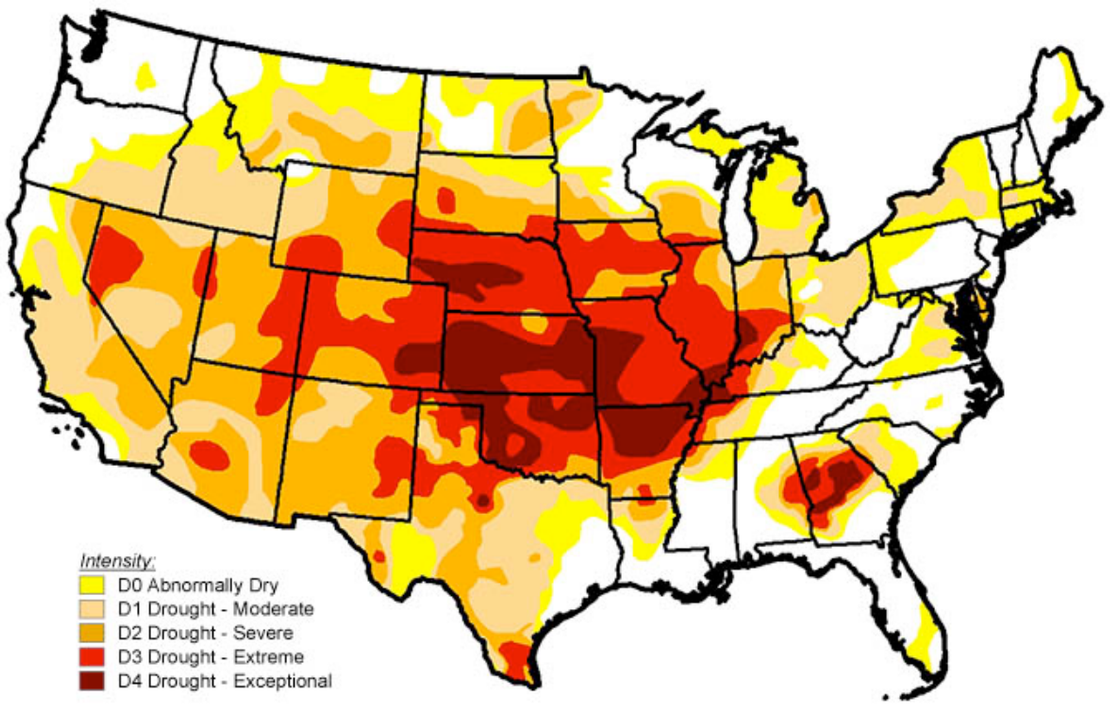
What are the effects of extreme events on perceptions of climate change?



Conclusions



Conclusions



Extreme events **may not change people's views** on climate change.

Conclusions

Risk Perceptions: an opportunity for framing?

Conclusions

Climate information: Is it useful? Is it usable?

The effects of the 2012 drought on climate change belief, risk perception, and adaptation among agricultural advisors in the US Corn Belt

Stuart Carlton, Postdoctoral Associate
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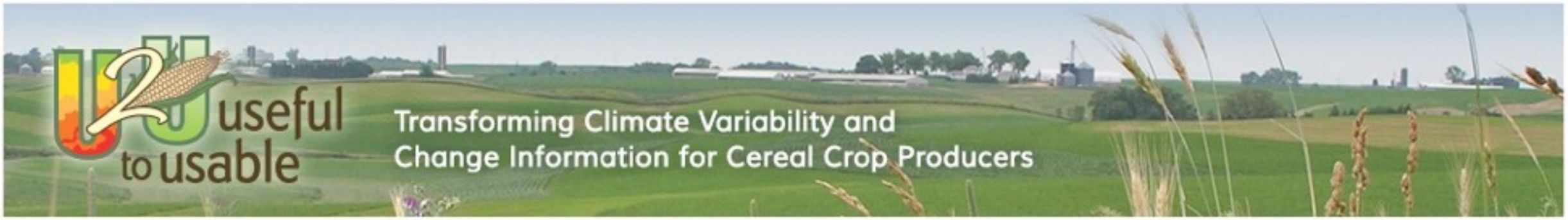
Agricultural Advisors: 2013 Survey

H2: Risk perceptions associated with climate change will have increased changed.

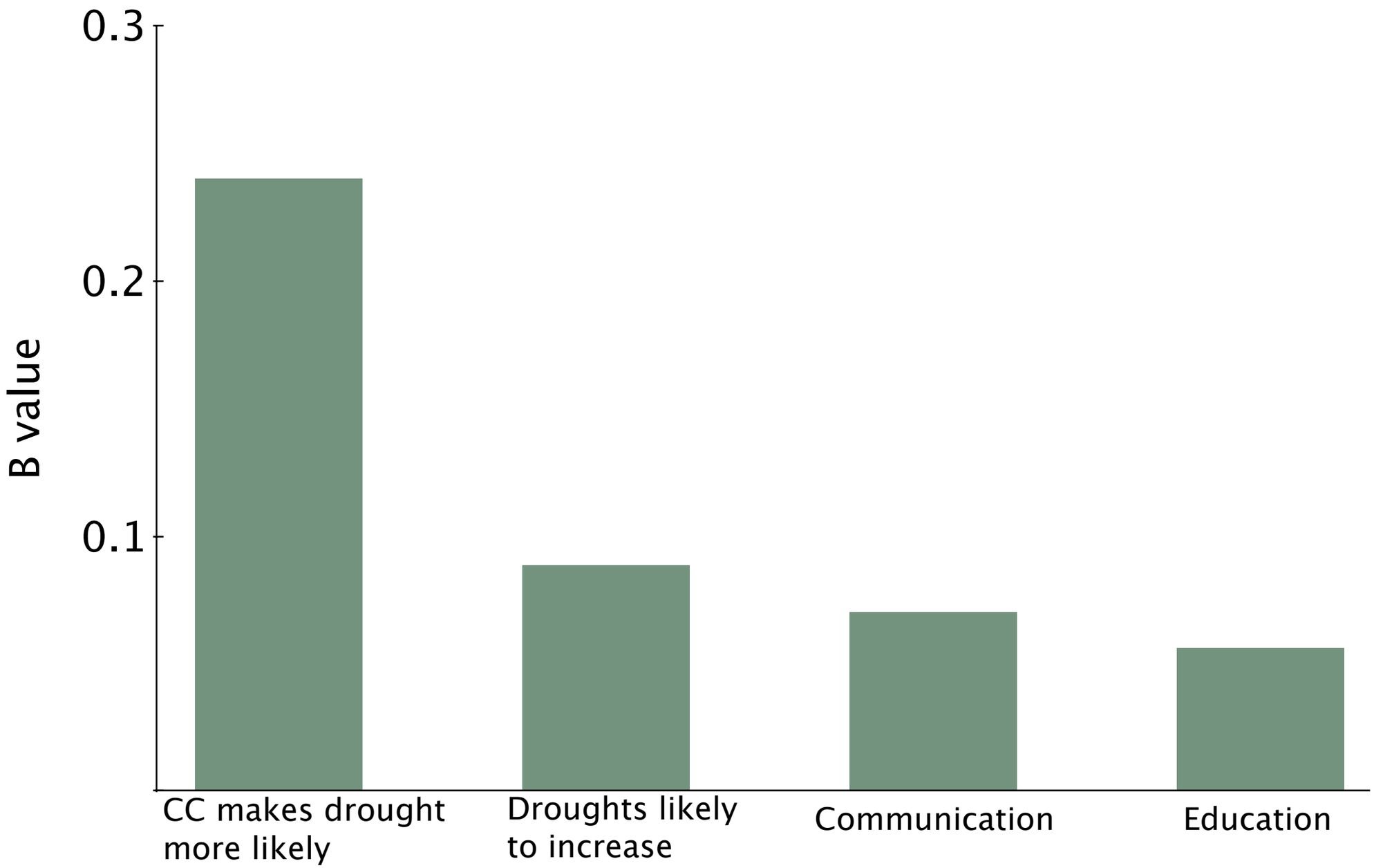
Agricultural Advisors: 2013 Survey

H2a: Risk perceptions will be a function of experience with the drought and communication about the drought.

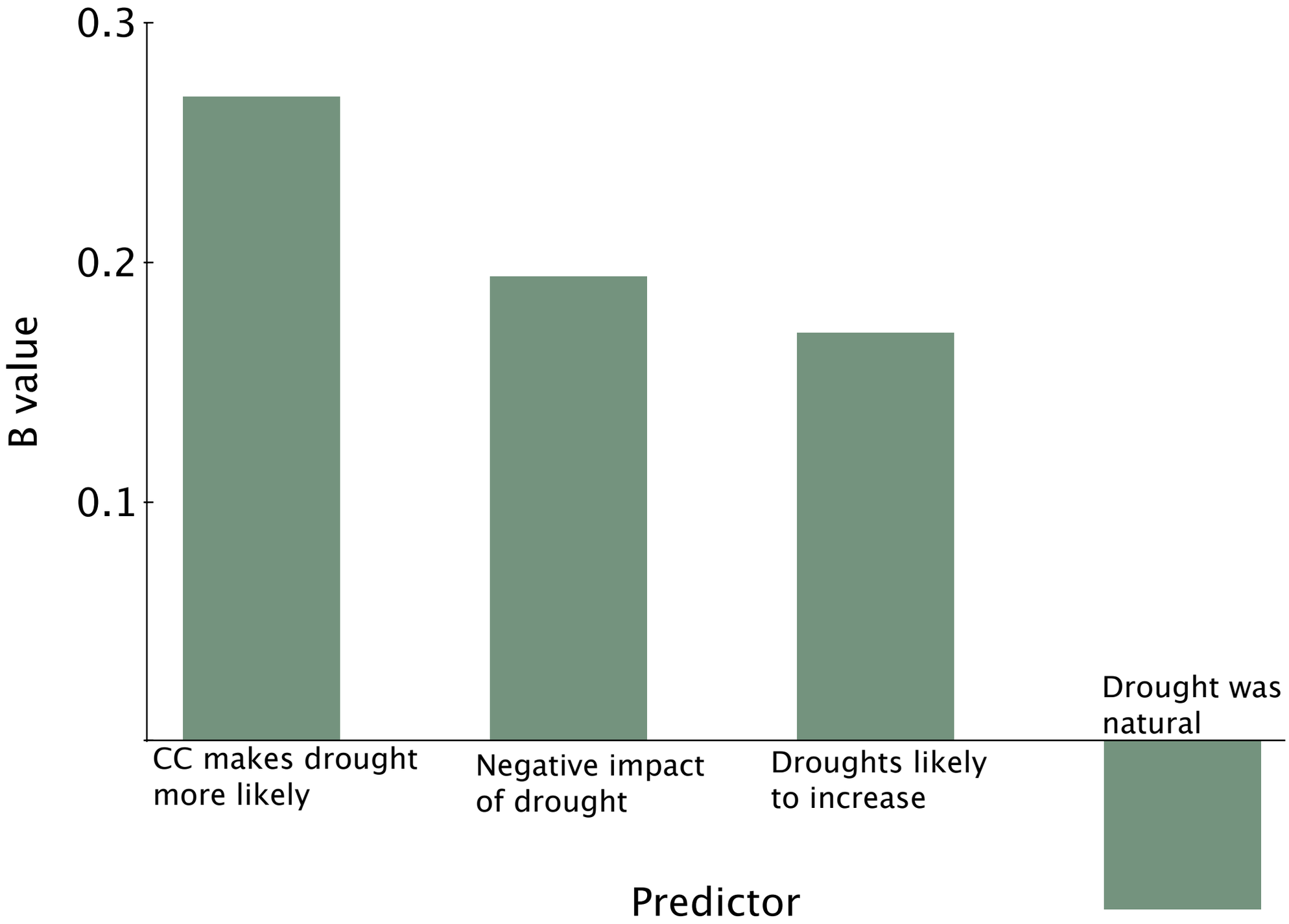


H2a: Influences on Risk Perceptions

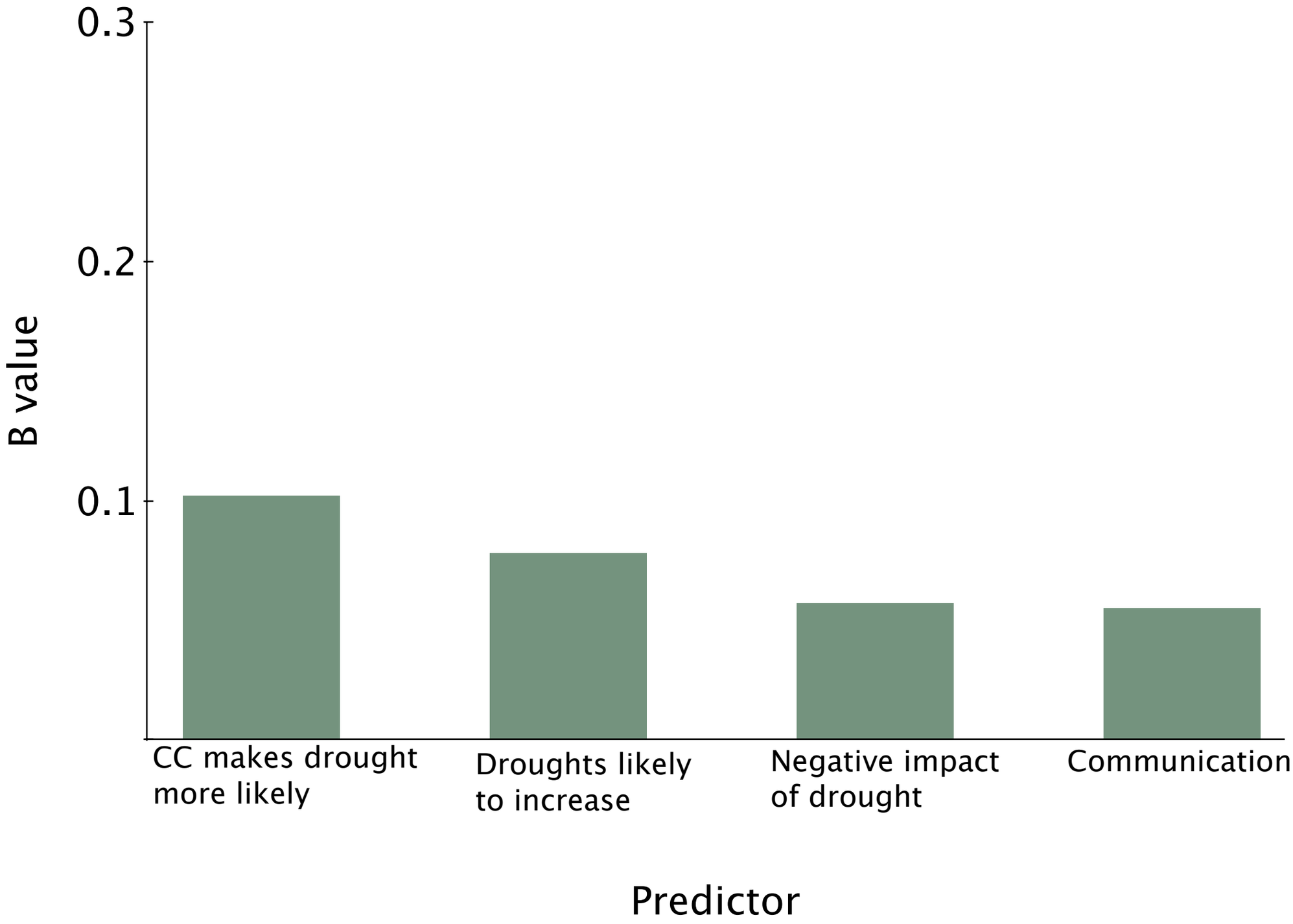
- **Experience** with the drought
- Whether respondents thought the drought was a **natural** part of the climate
- Whether respondents expected events like the drought to **increase** in the future
- Whether respondents thought **climate change** makes events like the drought **more likely**
- Whether respondents thought **climate change** made the drought **worse**
- **The extent to which people** communicated **about the drought.**



Wet risk significant predictors (R2=0.13)



Dry risk significant predictors (R2=0.27)



Nuisance risk significant predictors (R2=0.03)