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## Envisioning New Roles for Land-Grant University Extension: Lessons Learned from Climate Change Outreach in the Midwest

### Abstract

Recent surveys with farmers, Extension personnel, and agricultural advisors reveal interesting findings about climate change beliefs and who people trust for climate related information. Based on these results this article discusses a new direction for land-grant university Extension and research in addressing issues related to climate change and agriculture.

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Consequences of climate change are likely to be severe for agriculture. Extension should be helping stakeholders address this issue (Morris, Megalos, Vuola, Adams, D., Monroe, 2014). Towards that end, we have been working together for over 4 years on a USDA-NIFA funded project called "Useful to Usable (U2U)" that is developing climate information for corn producers in the North Central Region ([www.agclimate4u.org](http://www.agclimate4u.org)). As part of this project, we have conducted surveys with farmers, Extension personnel, and agricultural advisors. We have broadly defined agricultural advisors for the purpose of the study and surveyed state agency staff (Departments of Agriculture, Departments of Environment), Federal agency staff (NRCS and FFA), county agency staff (Soil and Water Conservation Districts), agricultural bankers, Certified Crop Advisors, and input dealers among others. Surveyed farmers managed over 80 acres of corn and grossed \$100,000 in 2011; operators of small farms are not included in the analysis. Extension educators surveyed were in agriculture and natural resources program areas.

### Beliefs, Influence, and Trust

Our surveys revealed several interesting findings that suggest new directions for Extension in our

region.

1. Land-grant university Extension educators do not believe in anthropogenic climate change at the same level as university scientists (Prokopy, Morton, Arbuckle, Mase, & Wilke, 2015b; see Table 1). This reveals a troubling disconnect between climate science and Extension, which has a critical role in disseminating the best science to the public and effectively conveying the needs of the public to university researchers.
2. Medium- and large-sized corn farmers are most influenced in their farm management decisions by Certified Crop Advisors and input dealers. A full 40% of farmers who responded to our farmer survey said they had no contact with Extension or were not influenced by them. Certified Crop Advisors and input dealers were cited as having a much greater influence (Davidson, Suddick, Rice, & Prokopy, 2015; see Figure 1). It is important to note that influence is not the same as trust, and other studies have found that farmers in the Midwest trust Extension more than they trust other groups (Campbell Hibbs et al. 2014; Mase et al. in press).

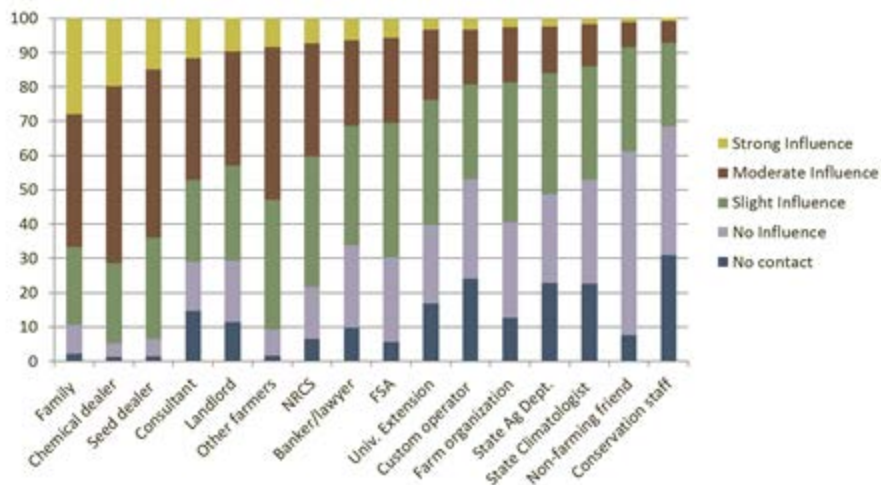
The diversity of advisors that we surveyed trust Extension more than they trust any other group for climate related information (Prokopy et al. 2015a; see Figure 2).

**Table 1.**  
Influence of Different Entities on Corn Producers in Midwestern United States

TABLE 1. Different climate change beliefs among key agricultural stakeholders.						
Survey question: There is increasing discussion about climate change and its potential impacts. Please select the statement that best reflects your beliefs about climate change.	CSCAP 2011 team survey (n = 121), 86% response rate	2012 U2U team survey (n = 33), 56% response rate	Climatologist survey (n = 19) 2012, 100% response rate	2012 extension educators survey across 12 Corn Belt states (n = 239), 35% response rate	2012 Ag advisors survey (n = 1605), 26% overall response rate	Farmer survey (n = 4778) 2012, 26% response rate
Climate change is occurring, and it is caused mostly by human activities.	50.4%	66.7%	53%	19.2%	12.3%	8%
Climate change is occurring, and it is caused more or less equally by natural changes in the environment and human activities.	30.6%	30.3%	37%	31.4%	37.8%	33%
Climate change is occurring, and it is caused mostly by natural changes in the environment.	10.7%	3%	5%	23.4%	24.9%	25%
There is not sufficient evidence to know with certainty whether climate change is occurring or not.	8.3%	0%	5%	24.7%	22.4%	31%
Climate change is not occurring.	0%	0%	0%	1.3%	2.6%	3.5%

Note: Excerpt from Prokopy et al. 2015b. CSCAP is the Corn-Based Cropping Systems Coordinated Agricultural Project ([www.sustainablecorn.org](http://www.sustainablecorn.org)) funded by the USDA National Institute of Food and Agriculture.

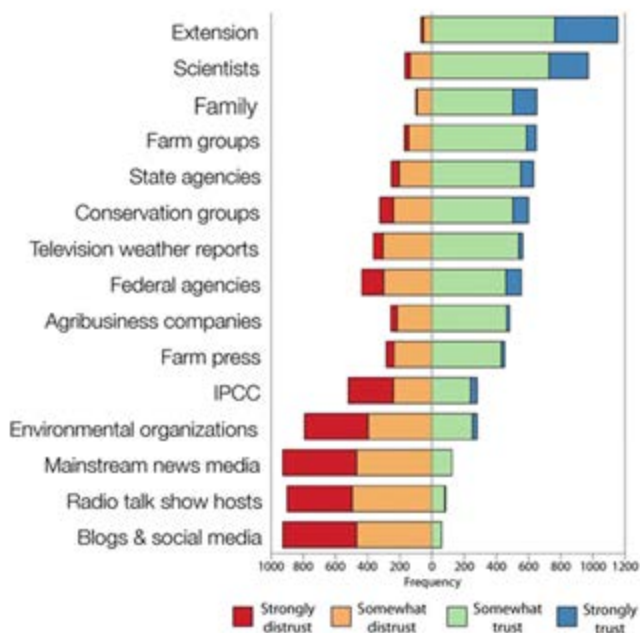
**Figure 1.**  
Influence of Different Entities on Corn Producers in Midwestern United States



Note: Excerpt from Davidson et al. 2015. Results of a 2012 survey of 4778 medium- to large sized corn producers in the Midwestern United States, conducted by scientists from U2U and the CSCAP. Results presented are in response to the question, "Please indicate how influential the following groups and individuals are when you make decisions about agricultural practices and strategies." More information about the methodology of this survey and survey findings can be found in Arbuckle et al. (2013), Tyndall et al. (2015), and Loy et al (2013). FSA is the USDA Farm Services Agency. NRCS is the USDA Natural Resources Conservation Service.

**Figure 2.**

Non Extension Agricultural Advisors' Trust in Different Groups as Sources of Information about Climate Change



Note: Excerpt from Prokopy et al. 2015a. This diverging stacked bar chart presents the trust data sorted by "Strongly trust." The axis is the count of the number of respondents. Bars to the right of 0

indicate trust, and bars to the left of 0 indicate distrust.

## The Future of Land-Grant Extension and Research

What does this mean for the future of land-grant university Extension and research in addressing issues related to climate change and agriculture? While our research relates to research and education on anthropogenic climate change, we suggest this research asks us to consider the following.

1. *There needs to be more ongoing communication between land-grant university researchers (with and without Extension appointments) and Extension educators.* Land-grant university researchers need to do a better job communicating climate-related scientific findings to Extension educators. Similarly, Extension educators need to communicate to researchers what they are hearing from farmers, agricultural advisors, and agriculture and conservation agencies and organizations—those with a stake in research results. Extension educators can help ensure that research is both meeting user needs and is communicated effectively.
2. *There needs to be a strong institutional commitment to ensure that both university researchers and Extension educators are rewarded in the tenure and promotion system for building these relationships.* While there are strong examples across the country of researchers and educators collaborating on climate-related programming in agriculture, land-grant university administrators can facilitate more consistent collaboration by emphasizing the value of integrated research and Extension in tenure, promotion, and other reward systems.
3. *Extension educators need to continue cultivating relationships with agricultural advisors and expand programs that emphasize agricultural advisors as recipients of university research and tools.* Given that farmers and agricultural advisors trust Extension, and given that Extension has fewer "boots on the ground" in many states, strengthening programming to agricultural advisors can maximize impact and be a strategic allocation of land-grant university resources.

Climate-related information is critical for farmers to sustain the production of food, fiber, fuel, and to keep rural communities that rely on agriculture strong. Extension has the capacity to provide leadership in translating climate-related information for farmers. We hope that research coming out of U2U and the other projects we describe above can inform Extension's future and benefit the people land-grant universities serve.

### Acknowledgements

This work is part of "Useful to Usable (U2U): Transforming Climate Variability and Change Information for Cereal Crop Producers" and is supported by Agriculture and Food Research Initiative Competitive Grant no. 2011-68002-30220 from the USDA National Institute of Food and Agriculture. Project website: <http://www.AgClimate4U.org>. The U2U project team is comprised of faculty, staff, and students from the following Land Grant and other Universities: Purdue University; Iowa State University; Michigan State University; South Dakota State University; University of Illinois; University of Michigan; University of Missouri; University of Nebraska-Lincoln; and University of Wisconsin.

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