



# Transforming Climate Variability and Change Information for Cereal Crop Producers

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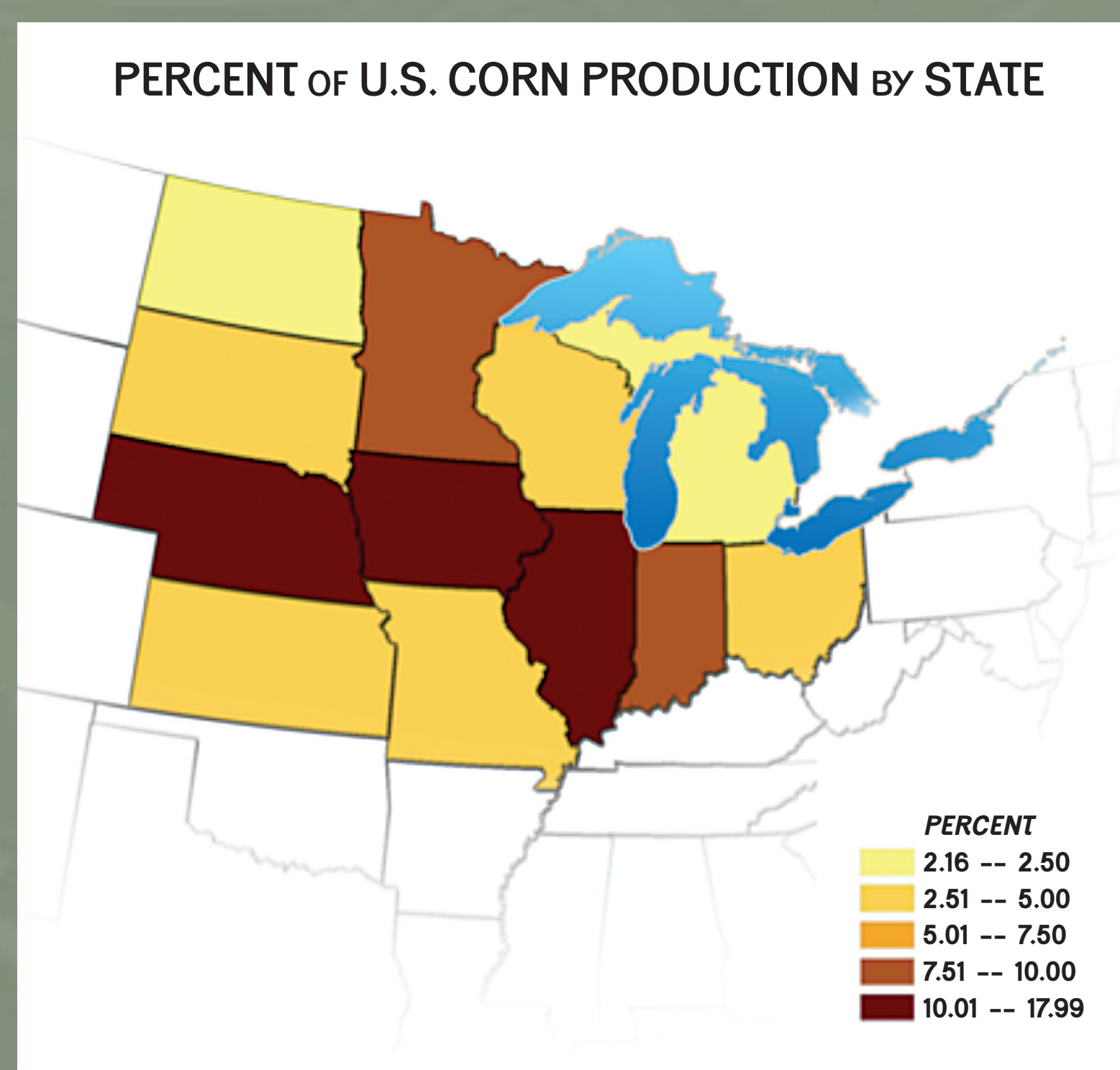


**Agricultural crops** contribute about \$150 billion annually to the U.S. economy, most of which comes from the intensely cultivated corn-belt region of the Midwest (USDA-ERA, 2010). Successful crop production in this area is highly dependent on favorable

temperatures and appropriate precipitation patterns, making the viability of this industry subject to increasingly variable climate patterns.

Though sufficient data are available to create better predictive and adaptive models, there are gaps in our understanding of how different land management practices can be used to help farmers adapt to climate variability and change while maintaining economic viability. Furthermore, currently available tools and models are not meeting producers' needs, and little is known about the types of information they would like to access.

*Useful to Usable (U2U): Transforming Climate Variability and Change Information for Cereal Crop Producers*, seeks to improve the resilience and profitability of farms in the North Central Region amid variable climate change through the development and dissemination of improved decision support tools, resource materials, and training.



## An Integrated Project

The U2U team is composed of a uniquely qualified group of over 30 climatologists, crop modelers, agronomists, economists, and social scientists from 10 partner universities across the Midwest.

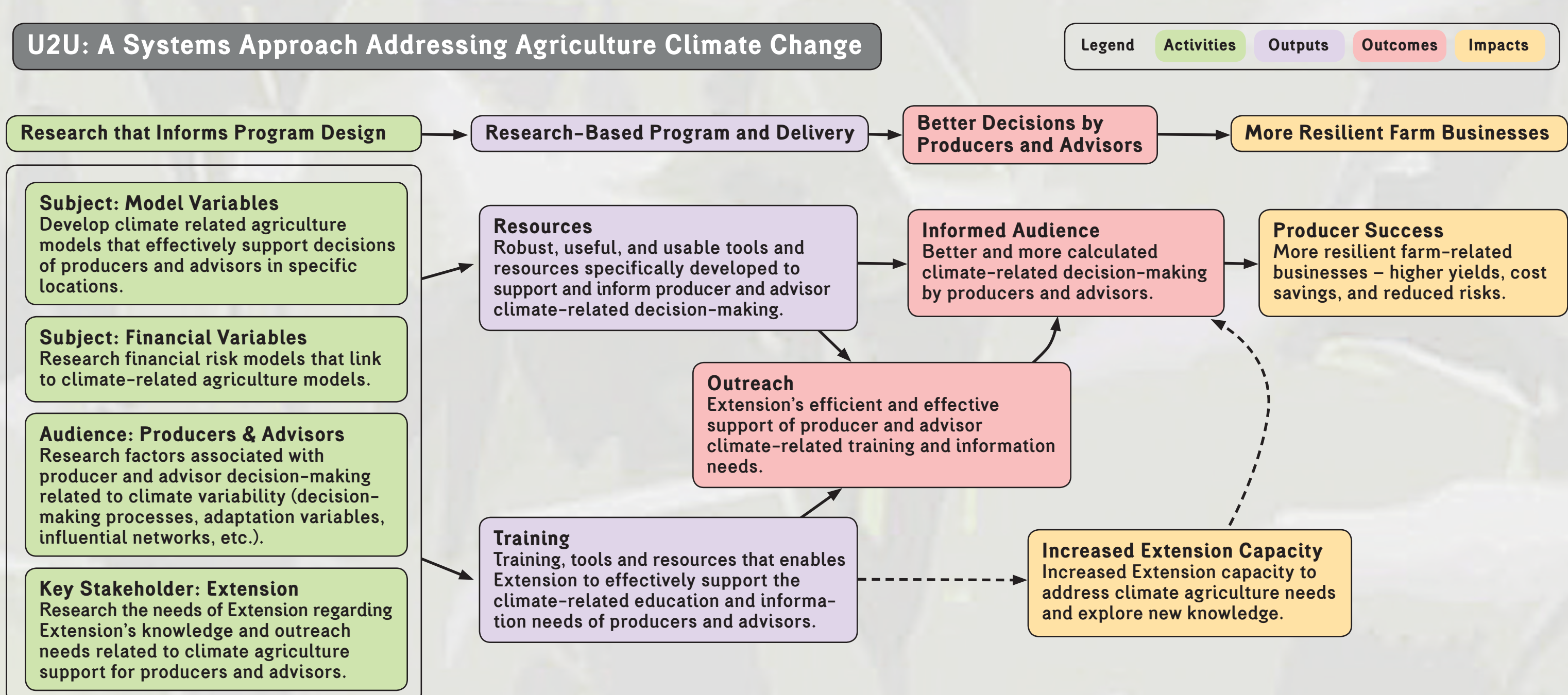
During the span of this 5-year project, collaborators will complete tasks associated with 5 objectives that together will improve the usability of climate information for the agricultural community and lead to more sustainable farming operations.

First the team will produce research on the biophysical and economic impacts of different climate scenarios on corn and soybean yields in the North Central Region (objective 1) and conduct complementary research to understand how producers and advisors are likely to use

this information (objective 2). Based on these findings, decision support tools (DSTs) and training materials will be developed to effectively deliver climate information to stakeholders (objective 3).

Next, DSTs will be piloted in a four-state region (Indiana, Iowa, Nebraska, and Michigan) to help improve tools and evaluate effectiveness (objective 4).

After several iterations with stakeholders to ensure the usability and utility of the tools, the program will be extended to all twelve states in the region (objective 5).



Ongoing engagement of key stakeholder groups including agricultural producers, advisors (i.e. crop associations, bankers, input suppliers, etc.), and extension educators are at the core of this project and highly critical to its success. Stakeholders will serve as both participants in the human dimension research and as representatives on the U2U advisory team. This type of "coproduction" of science is increasingly being called for by groups such as the National Academy of Scientists (NRC, 2009, 2010).

This integrated research and extension project will lead to the design and production of better tools and mechanisms to inform farming decisions under conditions of climate variability and change. The goal is to help producers make better long-term plans on what, when and where to plant and also how to manage crops for maximum yields and minimum environmental damage.

## HUBzero™

NSF-funded and Purdue University developed HUBzero™ technology (<http://hubzero.org>) will be used to facilitate the development and delivery of decision support tools, climate and adaptation information, and associated materials. The HUBzero™ technology is a web-based collaboration environment based on a number of open source packages (Linux, Apache, LDAP, PHP, Joomla, MySQL) that provide features including: interactive simulation tools, presentations and webinars, user groups, wikis and blogs, content tagging, calendar and news features, and feedback mechanisms.

The technology is low-bandwidth and can be accessed, like any website, through smart phones. HUBzero™ technology is fully developed and will serve as supporting middle-ware that holds together the various objectives throughout the life of this project and beyond.

### References:

United States Department of Agriculture –Economic Research Service (USDA-ERS). 2010. "Key Statistical Indicators of the Food and Fiber Sector." *Agricultural Outlook: Statistical Indicators*. Downloaded July 1, 2010 from <http://www.ers.usda.gov/publications/agoutlook/aotables/2010/05May/aotab01.xls>

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