

## Transforming Climate Variability and Change Information for Cereal Crop Producers



### 2016 PROJECT UPDATE

**Weather and climate patterns are a driving force** behind the success or failure of cropping systems. With U.S. corn and soybean production accounting for nearly one-third of global supplies and contributing over \$50 billion annually to the national economy, the ability to successfully produce crops under more variable climate conditions becomes critical for food security and rural livelihoods.

The U2U project strives to **enhance the usability and up-take of climate information and bolster Extension capacity** to address agro-climate concerns. We are developing climate-based tools to assist Corn Belt farmers and ag advisors with decisions related to purchasing, marketing and activity planning throughout the growing cycle. Long term, we expect these efforts will lead to **more profitable** agricultural systems and **greater resilience** to a changing climate.

## Top Project Accomplishments

1. Simulated the **impacts of historical and future climate** conditions on crop productivity across the U.S. Corn Belt using crop models of varying biophysical complexity and process scale representations.
2. Conducted three large-scale **surveys of Corn Belt farmers and ag advisors** about climate information needs, climate change beliefs and concerns, and trusted information sources.
3. Worked closely with stakeholders to develop four **web-based agro-climate decision support tools**. An additional tool focused on irrigation investment decisions will be released in 2016.
4. **Presented project information** at 90+ conferences and 140+ outreach events. Published 55 book chapters, journal articles, and Extension publications featuring U2U research.
5. Received an **additional \$600K in funding** among team members to expand and leverage U2U research, tools, and ideas.

## Project Collaborators

An integrated team of university researchers, climatologists and social scientists from across the Corn Belt collaborate on the U2U project.



The U2U Project Team

### Purdue University

Linda Stalker Prokopy\* (lead), Larry Biehl, Sarah Church, Otto Doering\*, Seong do Yun, Laura Esman, Ben Gramig\*, Elin Karlsson, Xing Liu, Dev Niyogi\*, Chris Panza, Paul Preckel, Ajay Singh, Carol Song\*, Shanxia Sun, Molly van Dop, Melissa Widhalm, Lan Zhao

### Iowa State University

Chad Hart\*, Jean McGuire, Lois Wright Morton\*, Eugene Takle\*, Adam Wilke

### Michigan State University

Gopal Alagarswamy, Jeff Andresen\*

### South Dakota State University

Dennis Today\*

### University of Illinois

Jim Angel\*, Beth Hall\*, Steve Hilberg, Atul Jain\*, Olivia Kellner, Yang Song

### University of Michigan

Yun-Jia Lo, Maria Carmen Lemos\*

### University of Missouri

Pat Guinan\*, Ray Massey\*

### University of Nebraska-Lincoln

Juliana Dai, Roger Elmore\*, Tonya Haigh, Cody Knutson\*, Martha Shulski\*

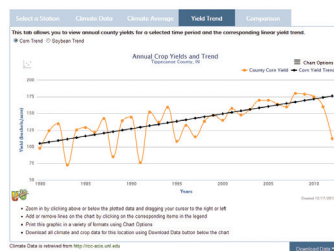
### University of Wisconsin

Kim Kies, Jenna Klink, Vikram Koundinya, Rebecca Power\*, Amber Schmechel

\*Denotes co-project investigator

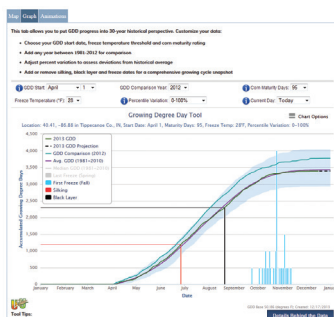
## AgClimate View<sub>DST</sub>

A convenient way to access customized historical climate and crop yield data for the U.S. Corn Belt. View and download graphs of monthly temperature and precipitation, plot corn and soybean yield trends, and compare climate and yields over the past 30 years. AgClimate View also provides insights on rainfall and temperature variability throughout the year and lets you compare current conditions to the historical average.



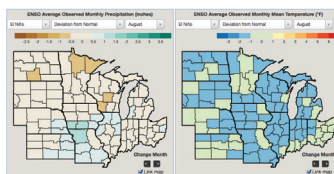
## Corn GDD<sub>DST</sub>

Track real-time and historical corn growing degree day accumulations, assess spring and fall frost risk, and guide decisions related to planting, harvest and seed selection. This innovative tool integrates corn development stages with weather and climate data for location-specific decision support, tailored specifically to agricultural production.



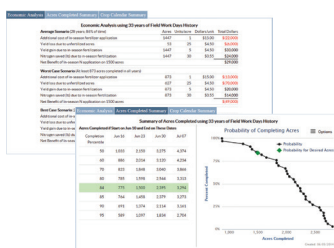
## Climate Patterns Viewer<sub>DST</sub>

Discover how global climate patterns like the El Niño Southern Oscillation (ENSO) and Arctic Oscillation (AO) have historically affected local climate conditions across the U.S. Corn Belt. Climate Patterns Viewer provides simple maps and charts to determine when (by month) and where (by climate division) specific phases of ENSO or AO have influenced temperatures, precipitation and crop yields.



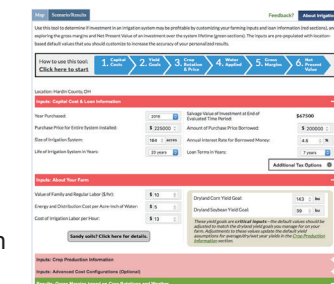
## Corn Split N<sub>DST</sub>

This product can be used to determine the feasibility and profitability of using post-planting nitrogen application for corn production. The Corn Split N tool combines historical data on crop growth and fieldwork conditions with economic considerations to determine best/worst/most likely scenarios of successfully completing nitrogen applications within a user-specified time period.



## Irrigation Investment<sub>DST</sub>

Explore the profitability of installing irrigation equipment at user-selected locations across the Corn Belt. Discover how many years from 1980-2012 irrigation would have been profitable, the expected net present value of investment, and compare unirrigated and irrigated corn and soybean yields under different rainfall conditions. This tool can be customized based on yields and irrigation costs, and provides valuable insight on an expensive long-term investment that may help you cope with variable climate conditions.



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For more information,  
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