Climate and Corn Systems CAP: Overview and Flowchart

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INTRODUCTION

Corn is essential in America. The highly versatile crop is an economic powerhouse, employing millions and producing food, fuel, fiber and other critical goods. American farmers heavily invest their time, land and money in the crop's production, planting about 20 percent of all U.S. cropland to corn.

Global and domestic demand for corn continues to rise. However, there is increasing uncertainty about how long-term US climate trends are impacting corn-based cropping systems and threatening agricultural investments. In response, farmers are seeking new ways to ensure continued crop productivity while also minimizing its environmental impact.

MATERIALS & METHODS

- This five-year project assesses the environmental, economic and social impacts of long-term climate variability on corn-based crop management systems.
- Ten Midwestern land grant universities and two USDA Agricultural Research Service laboratories are partnering with USDA - National Institute of Food and Agriculture.[1]
- The project gathers data from more than 20 field test sites across the Midwest to focus on ways to mitigate and adapt the system to best promote its long-term sustainability and productivity.
- Researchers are measuring carbon, nitrogen, greenhouse gas and water usage levels from various crop management practices, including:
  - tillage
  - cover crops
  - corn-soybean rotation
  - extended crop rotations
  - controlled drainage water management
  - nitrogen management techniques.
- A diverse team of researchers from multiple disciplines are sharing data in a single comprehensive database.
- By studying local data along with huge quantities of regional data, project participants are better able to understand the various implications of their research.
- This enhanced understanding guides creation of extension and education programs for farmers and teachers, working to connect them with project resources and analyses.

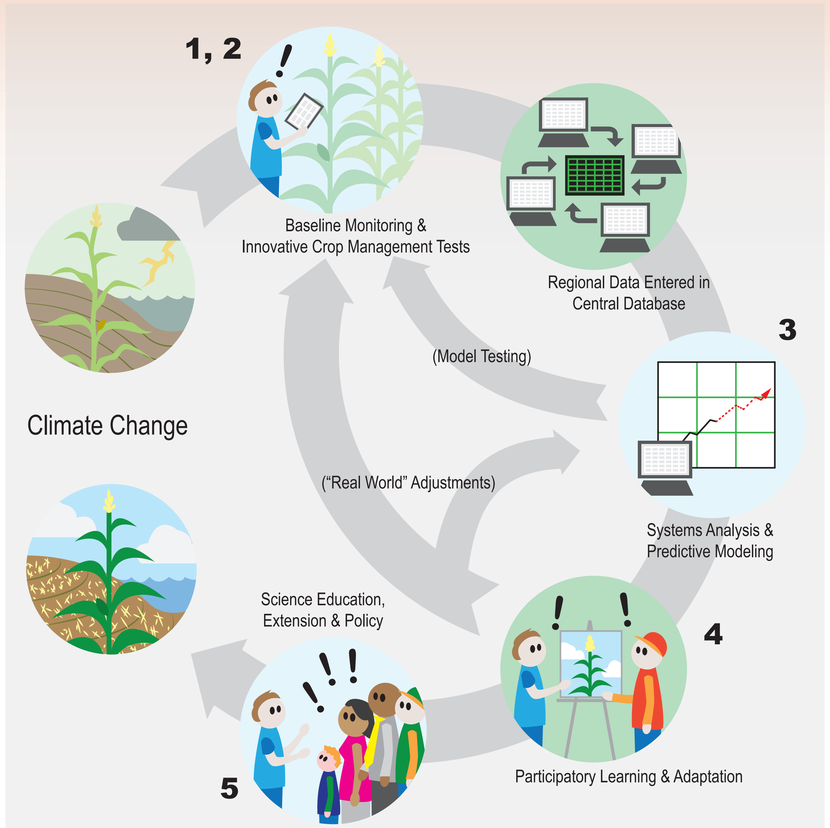

Fig. 1 - CSCAP: Climate Change, Mitigation, and Adaptation in Corn-based Cropping Systems Project Flowchart

This flow chart conceptualizes the multi-directional connections among the project objectives. The numbers displayed on the flowchart above correspond with the numbered objectives in the right column.

- Project partners are placing a strong emphasis in establishing lasting research networks, working with farmers and producers to encourage resilient decision-making, and training the next generation of scientists to work with a wide array of partners.
- This project directly involves farmers and local watershed groups across the region who are engaged in co-learning with the scientific team.

OBJECTIVES (SUMMARIZED)

(See Figure 1)

1. Develop standardized methodologies and perform baseline monitoring of carbon, nitrogen, and water footprints.
2. Perform field tests to evaluate the impacts of various crop management practices on carbon, nitrogen, and water footprints.
3. Apply models to research data to identify potential scenarios and outcomes for the sustainability and economic vitality of corn-based systems.
4. Perform analyses of the various practices and evaluate the willingness of producers and farmers to optimize use of best management practices.
5. Integrate education, extension, outreach, and stakeholder participation across all aspects of the program.

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For more information, visit sustainablecorn.org.

[1] The 12 organizations comprising the project team include the following Land Grant Universities and USDA Agricultural Research Services (ARS):
Iowa State University; University of Illinois; Lincoln University; Michigan State University; The Ohio State University; Purdue University; University of Minnesota; University of Missouri; University of Wisconsin; USDA-ARS Columbus, Ohio; USDA-ARS Coshocton, Ohio; and South Dakota State University.

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