



#Diverse Corn Belt:

Enhancing Rural Resilience Through Landscape Diversity in the Midwest



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Premise

In 2022...

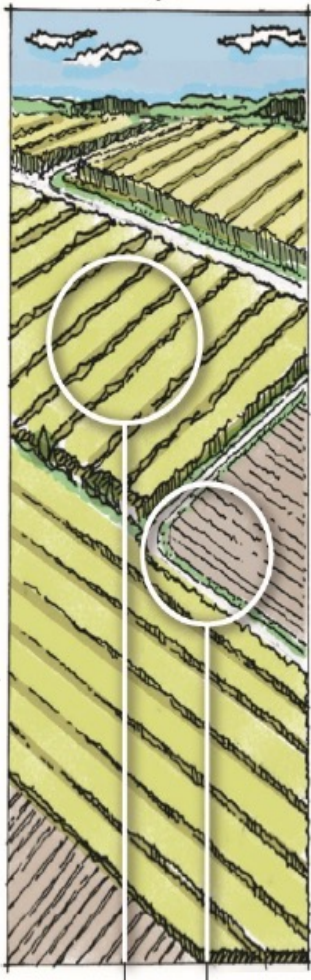
- Corn Belt farmers produced **6.7B bu** of corn and soybeans on **55 M acres** with a combined worth of **\$61 B**
- Increasing farm bankruptcies, declining farm employment, diminishing rural communities, and environmental degradation
- Global unrest, lingering effects of pandemic disruptions and a changing climate poses additional threats to the current dominant paradigm

These struggles expose a **lack of resilience, persistent failure, and diminishing returns** of an agricultural systems based on monocultures.

Evidence suggests...

- Solutions can include **shifting agricultural systems towards greater diversity** on farms, on the landscape, and in agricultural markets
- A need for **systematic analysis and assessment of pathways towards resilient intensification** at farm, landscape, and market levels

Current System

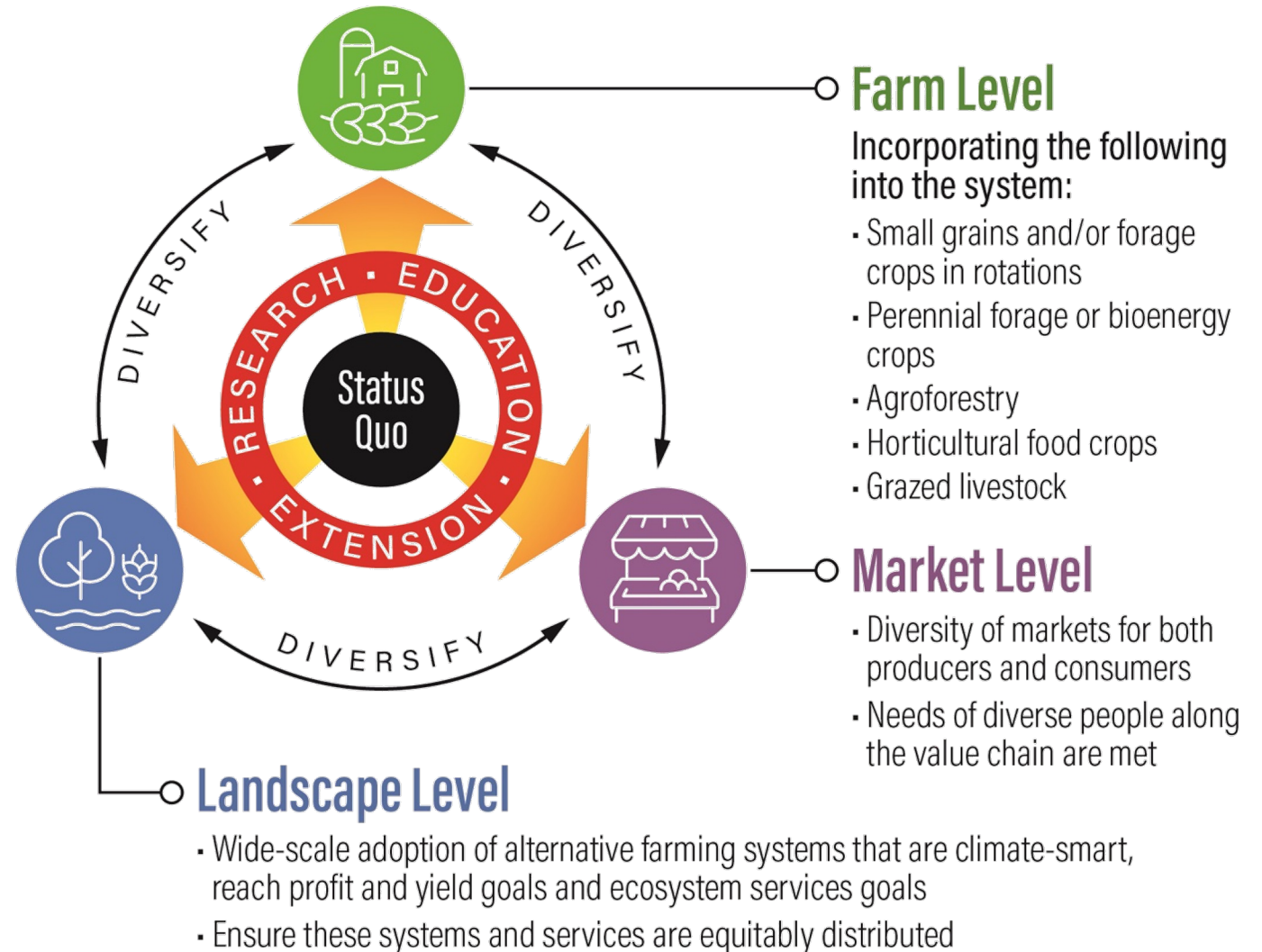


Transformed System



Our Plan

The DCB team will generate **evidence-based visions and frameworks to inform a more diversified dominant system.** The transformed system will be capable of overcoming persistent market and policy barriers to support a transition to **resilient intensification and a more economically, environmentally, and socially sustainable system.**





Project Overview

Objective 1: Coproduction

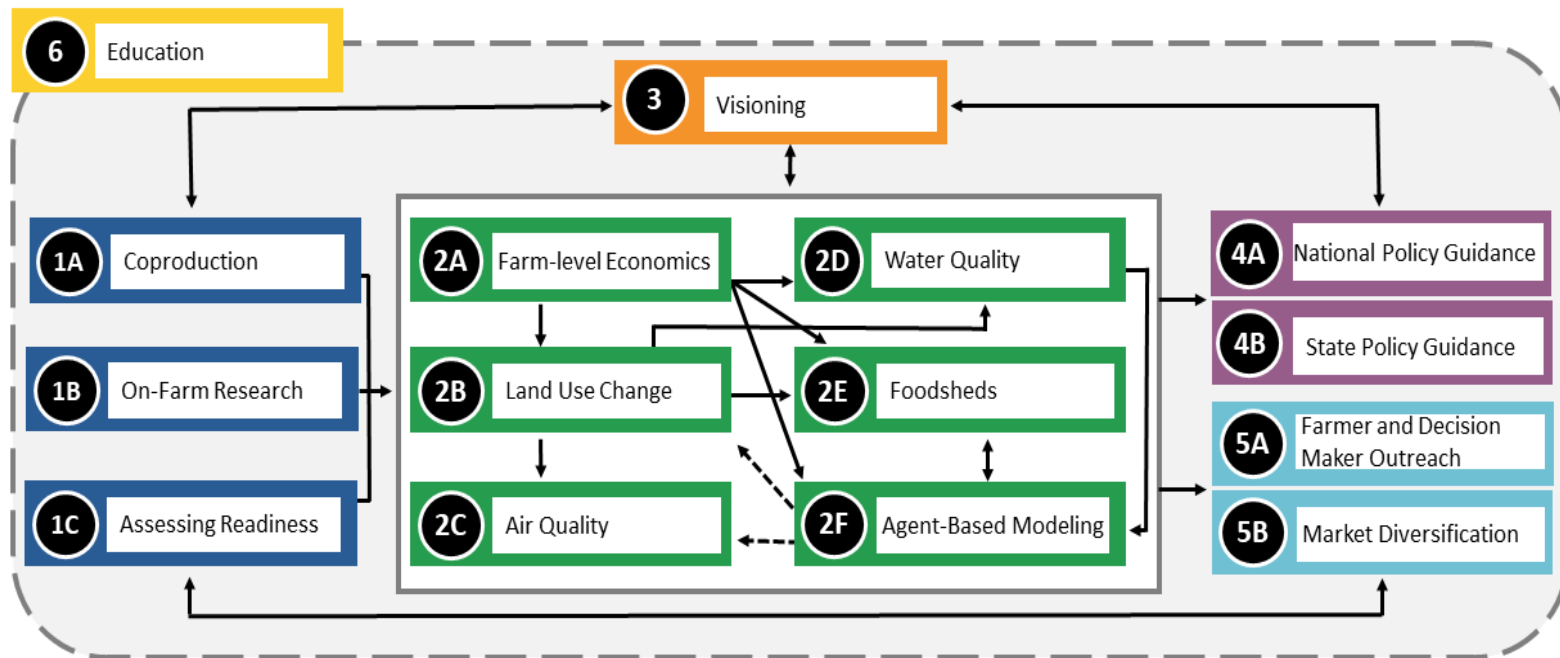
Objective 2: Modeling

Objective 3: Visioning

Objective 4: Policy Guidance

Objective 5: Stakeholder Engagement

Objective 6: Education





Project Overview

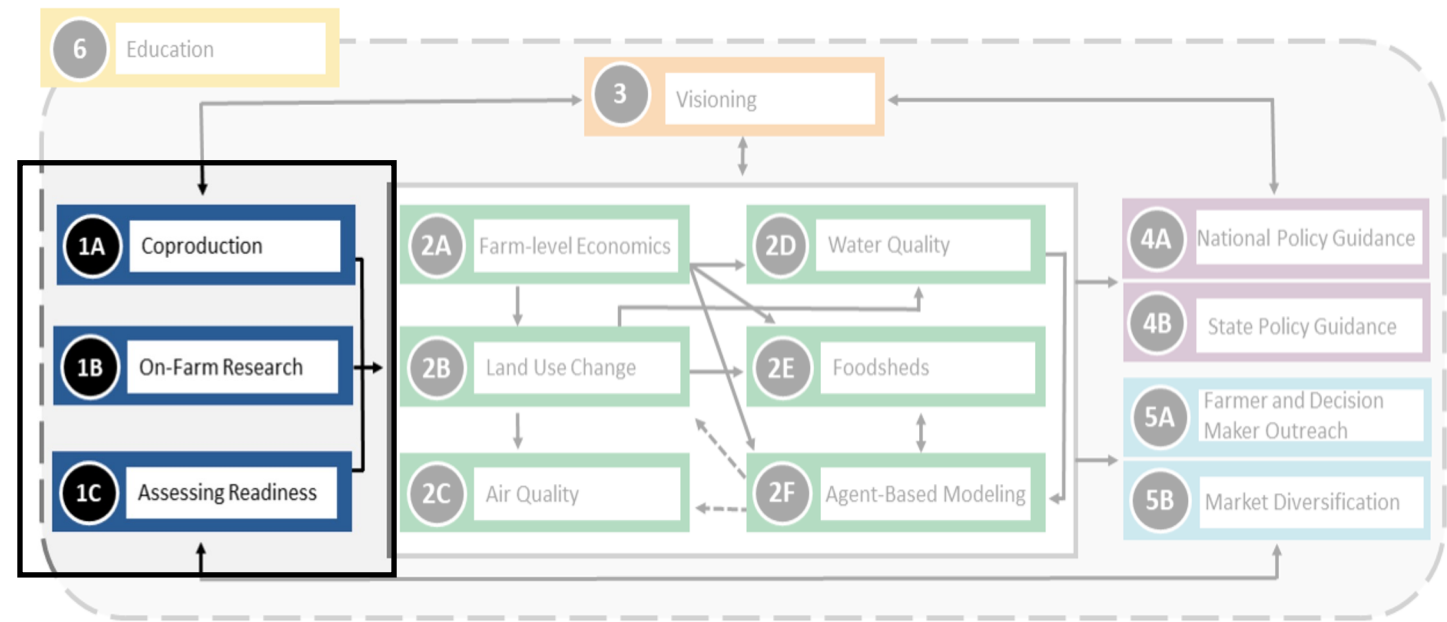
Objective 1a: Coproduction – Stakeholder Engagement

Focus Groups

Reimagining Agricultural Diversity (RAD) Teams

Understand perspectives of the current systems, factors needed to enable diversification

Explore participants' research questions

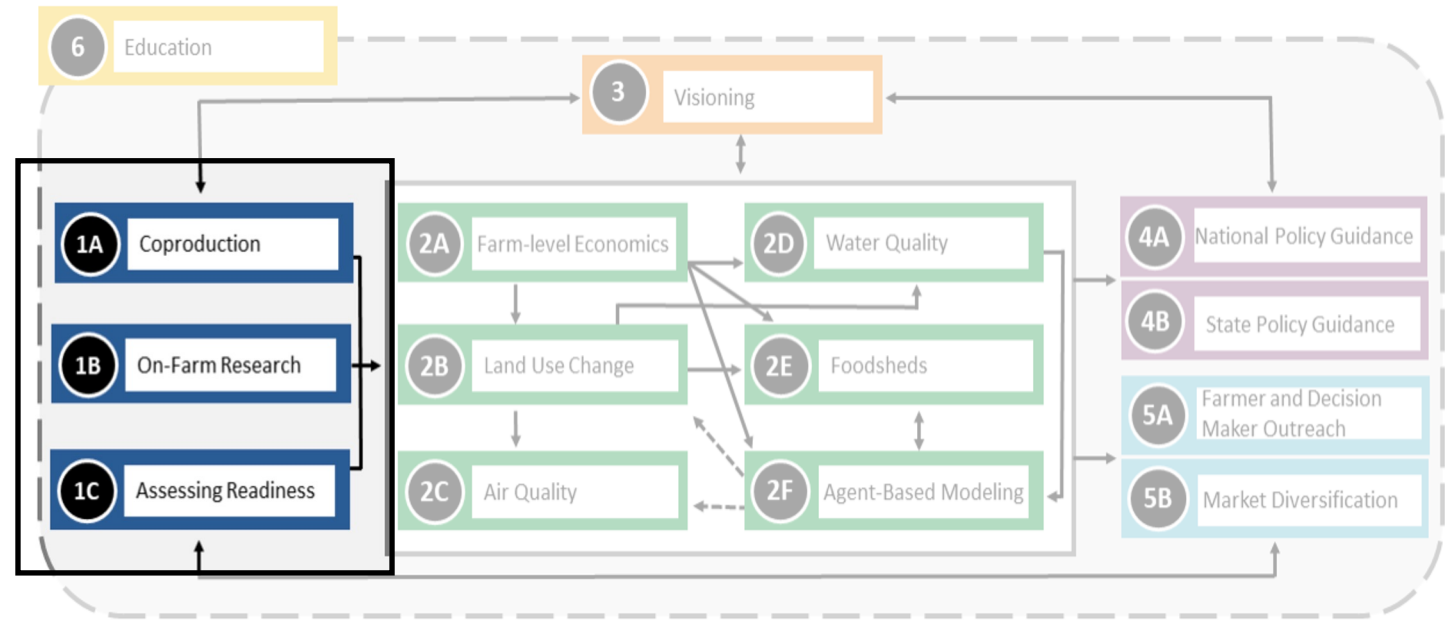




Project Overview

Objective 1b: Coproduction – On-farm Research

- Gather data (water quality, soils, insect biodiversity) from diverse and conventional systems
- Characterize conditions, and to what extent diversification alters indicators of biophysical sustainability





Project Overview

30+ collaborating farms, 90+ fields

- Indiana, Illinois, Iowa
- Diversified and non-diversified farms
- Data collection is underway





Project Overview

Objective 1c: Coproduction – Value Chain Readiness

Identify value chain barriers that limit diversification as well as policy supports that may facilitate change.

Explore barriers and motivations for farmers to diversify and farm advisors to recommend diversification as a viable strategy

Method	Audience	Purpose
Survey	I-State farmers	Motivation/barriers to diversification
	CCAs and Extension	Recommendation drivers
	I-State farmers	Will to accept payment
	Row/specialty crop buyers	Opportunities/barriers, Interest in diverse products
	Marketing/trade orgs.	ID sustainability efforts
	Consumers	Preference/will to pay for specialty crops/labels
Interview	Diversified farmers	Motivation/barriers to diversification
Focus group	Food/Retail companies	Test consumer facing stories/messaging
Case study	Innovative markets	ID key factors leading to success



Project Overview

Objective 1: Coproduction

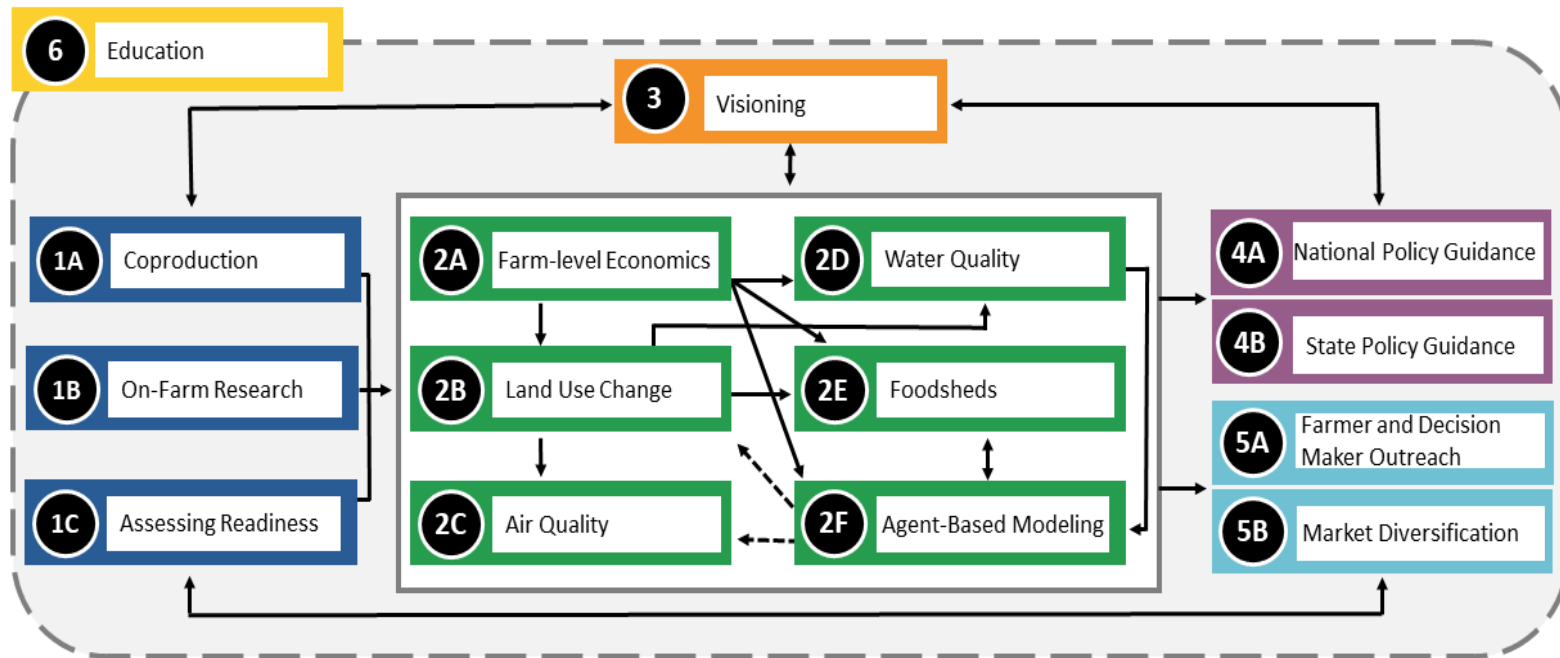
Objective 2: Modeling

Objective 3: Visioning

Objective 4: Policy Guidance

Objective 5: Stakeholder Engagement

Objective 6: Education





Our Team

Randy Ackah, Illinois State Univ.

J. Arbuckle, Iowa State Univ.

Shalamar Armstrong, Purdue Univ.

Lauren Asprooth, Univ. California-Davis

Shadi Atallah, Univ. of Illinois

Megan Baskerville, The Nature Conservancy

Chris Boomsma, American Society of Agronomy

Sarah Church, Montana State Univ.

Finnleigh Doherty, Univ. of Illinois

Christine Elliott, Purdue Univ.

Lydia English, Practical Farmers of Iowa

Kristin Floress, USDA-Forest Service

Paige Frautschy, The Nature Conservancy

Phil Gassman, Iowa State Univ.

Ken Genskow, Univ. of Wisconsin-Madison

Ben Gramig, USDA-Economic Research Service

Steven Hallett, Purdue Univ.

Seth Harden, The Nature Conservancy

Emily Heaton, Univ. of Illinois

Ryan Heiniger, CTIC

Jason Hill, Univ. of Minnesota

Natalie Hunt, Univ. of Minnesota

Isabel Jensen, Purdue Univ.

Kris Johnson, The Nature Conservancy

Ian Kaplan, Purdue Univ.

Paul Kelleher, Univ. of Wisconsin-Madison

Lisa Kushner, The Nature Conservancy

Pete Lammers, Univ. of Wisconsin-Platteville

Sarah LaRose, Purdue Univ.

Andrew Margenot, Univ. of Illinois

Liz Maynard, Purdue Univ.

David Mulla, Univ. of Minnesota

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Katherine Pivaral, Purdue Univ.

Linda Prokopy, Purdue Univ.

Pranay Ranjan, Purdue Univ.

Yichao Rui, Purdue Univ.

Keith Schilling, Univ. of Iowa

Silvia Secchi, Univ. of Iowa

Aslihan Spaulding, Illinois State Univ.

Aaron Thompson, Purdue Univ.

Michael Tiboris, Independent

Ariana Torres, Purdue Univ.

Rebecca Traldi, Purdue Univ.

Camilla Ulloa, Purdue Univ.

Emily Usher, Purdue Univ.

Steve Werblow, CTIC



UNIVERSITY OF MINNESOTA



The Nature Conservancy





Our Advisory Committee

- Nicole Atchison, PURIS Foods
- Chad Bell, Bell Farms
- Dan DeSutter, DeSutter Farms
- Matt Liebman, Iowa State University
- Jason Mauck, Constant Canopy/Munsee Meats
- Steve Rosenzweig, General Mills
- Bill Schleizer, Delta Institute
- Richard Straight, USDA-National Agroforestry Center
- Dennis Todey, USDA-ARS Midwest Climate Hub
- Ben Wicker, Indiana Agriculture Nutrient Alliance
- Roger Wolf, Iowa Soybean Association





Thank you!



Scan to get involved and follow along with DCB!

www.DiverseCornBelt.com



For more information contact:

Project Director, Linda Prokopy at lprokopy@purdue.edu

Project Manger, Emily Usher at eusher@purdue.edu



This research is part of “#DiverseCornBelt (#DCB): Enhancing rural resilience through landscape diversity in the Midwest,” and is supported by Agriculture and Food Research Initiative Competitive Grant 2021-68012-35896 from the USDA National Institute of Food and Agriculture.

National Extension Climate Initiative (NECI)

NECI was formed in 2019 to raise the profile of climate issues within Extension and to enhance our capacity to educate on all aspects of climate change.

➤ NECI started with 5 members, has 650 now

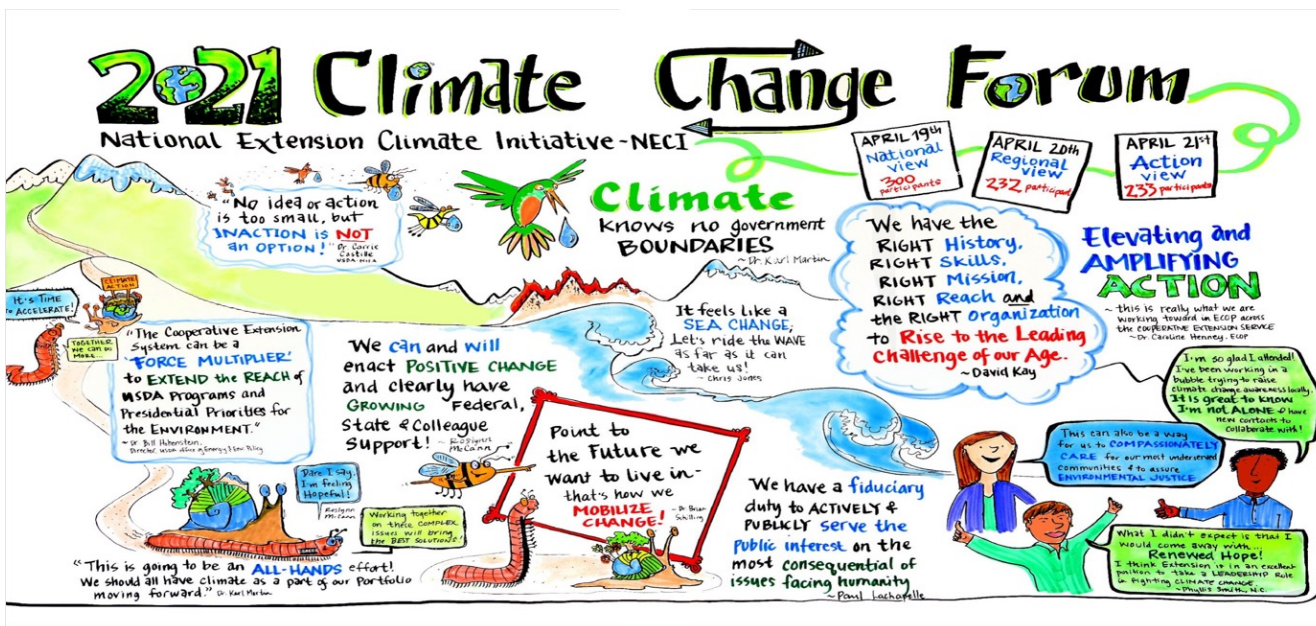
VISION: We envision a future in which Cooperative Extension recognizes the urgency of the climate crisis and is actively engaged in creating communities that ensure environmental and human health, social equity and justice, and economic vitality for all generations.

NECI helps Extension to

- coordinate and manage climate outreach activities
- share climate resources
- provide networking opportunities
- promote professional development



<https://nationalextensionclimateinitiative.net/>



Intro to Climate Hub Work



Assessments and Syntheses
Delivering relevant information

Outreach and Education
Enabling climate-informed decisions

Technical Support
Facilitating engagement, discovery and exchange



FY22 National Hub Priorities



Build Climate Awareness

- Synthesize, Interpret, Communicate

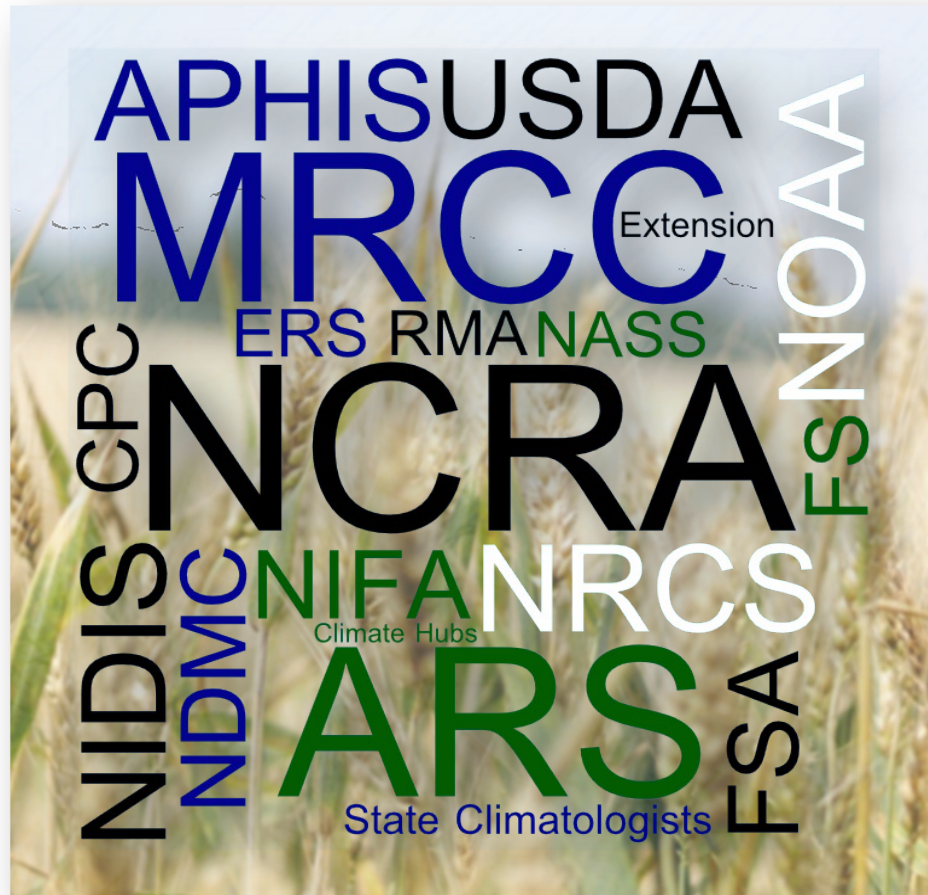
Enhance Resilience and Productivity

- Develop relevant tools
- Inform stakeholders about timely climate concerns and events

Increase Program Effectiveness

- Engage stakeholders
- Scale up existing efforts

Partners



Stakeholders

Crop Consultants
Commodity Organizations
Soil and Water
Conservation Districts
Other USDA Agencies
Cooperative Extension
Land Grant Universities
Farmers
Ranchers
Forest Land Owners
Specialty Crop Growers
...And Many Others

Future Efforts

Climate Smart Agriculture Practices

- Adaptation
- GHGs
- Cropping Systems

Climate change –agriculture interactions

Evapotranspiration climatologies

Midwest soil temperature

- Visualizations
- Climatologies
- Freeze-thaw cycles

Degree-day and chilling hour tools

Evaluating Midwest climate services

Climate/Drought impact assessments

Leadership and Project Management

- Dennis Todey – Midwest Climate Hub Director
- Laurie Nowatzke – Midwest Climate Hub Coordinator
- [Incoming] – ARS Liaison for the Climate Hubs (SY position)

Hub Support

- Melissa Kadolph – Program Support Assistant (50% with Hub)
- Delenn Palmer – Undergraduate lab assistant

Novel Research and Evaluation

- [Incoming] – Post-PhD Fellow in Ag Meteorology and Climate Modeling
Project: TBD (ET, Soil Moisture, other?)
- [Incoming] – Post-PhD Fellow in Agroforestry
Project: Northern Forest Hub work
- [Incoming] – Post-Doc in Agronomy or similar
Project: AFRI Hub-Extension Connection, Climate-smart agricultural practices
- [Incoming] – Post-Master's ORISE in Physical/Social Science
Project: Climate Impacts – Northern Forests

Outreach Development and Evaluation

- [Incoming] – Post-Doc ORISE in Physical//Social Sciences
Project: Develop Adaptation/Mitigation Strategy Libraries
- [Incoming] – Post-Master's in Social Sciences
Project: Evaluate existing climate services

NC3



Leadership Team:

- Laura Edwards (South Dakota)
- Hans Schmitz (Purdue)
- Aaron Wilson (THE OHIO STATE)
- Monica Jean (Michigan State)
- Peter Tomlinson (Kansas State)

Program Manager

- Kathy Gehl (Kansas State)

Climate Ready Midwest (NIFA: Extension-USDA Climate Hub)

- Define what climate smart means to midwestern Extension and ag community
- Empower Extension to lead climate-informed ag programming
- Theories of Change (shared roadmaps) for 1862s, 1890s, 1994s, combined
- Climate Ready Farms/website/stories
- Carbon Sequestration Curriculum
- 4-H National Curriculum

CAMF (NIFA: Extension-USDA Climate Hub)

- Applied knowledge about and confidence in managing climate change impacts.
- Support farmers and agricultural advisors (“fellows”) Develop outreach and education products.
- Help advisors to integrate climate change information into current programs and/or develop new programs.
- Develop recommendations for future climate-focused programs targeting partner agencies and organizations, including Extension.

IMPACT² (NIFA: Extension-USDA Climate Hub)

- Knowledge and attitude changes toward climate-smart agriculture for farmers, advisors, landowners, Extension, and USDA
- Increase climate resilience and support for diversified cropping systems
- Visioning scenarios (diverse audiences)
- Resource Portal
- Training materials and workshops

Diverse Corn Belt (NIFA: AFRI-SAS)

- Evidence-based visions and frameworks to inform a more diversified dominant system
- Overcome market and policy barriers to support transition to resilient intensification
- Barriers to farm, landscape, and market diversification
- Coproduction (characterizing conditions and biophysical sustainability)
- Modeling (economic and ecosystem impact)
- Visioning (Stakeholder-informed alternative production systems)
- Policy Guidance
- Extension (Engage with on-farm supply chain stakeholders to support farm and market development)
- Education (Secondary and Undergraduate level, Midwestern Sustainable Ag Tour, Workforce development that is responsive)