#Diverse Corn Belt:
Enhancing Rural Resilience Through Landscape Diversity in the Midwest

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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
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.
Objective 1: Coproduction

Objective 2: Modeling

Objective 3: Visioning

Objective 4: Policy Guidance

Objective 5: Stakeholder Engagement

Objective 6: Education
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
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
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.

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<th>Purpose</th>
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<td>Survey</td>
<td>I-State farmers</td>
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<td>Case study</td>
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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
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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
Callie North, CTIC
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
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
Scan to get involved and follow along with DCB!

www.DiverseCornBelt.com

For more information contact:
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Project Manager, Emily Usher at eusher@purdue.edu

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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

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

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.

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)