Notes from the Program Director

Over six years ago, we proposed a graduate traineeship with a vision to build a community of researchers that explores, develops and implements effective data-driven decision-making to efficiently produce food, transform primary energy sources into energy carriers, and enhance water quality. When the $3 million grant was awarded, we hired a program coordinator, got to work on putting all the elements of the program in place, and recruited the first cohort of trainees.

As the project progressed, we continually grappled with one persistent question: how to induce busy graduate students to engage in the training and community-building activities that would produce our desired outcomes – particularly, multidisciplinary collaboration? The answer we increasingly adopted was to involve trainees in the leadership of nearly all program components. Ultimately, this sharing of program ownership has resulted in the final cohort choosing to conduct multidisciplinary projects as a way to satisfy a requirement we designed for documenting individual trainee learning outcomes.

This final annual report summarizes all six years of activities, with a focus on the most recent year and final cohort, and highlights the first professional steps of our trainee alumni. We’re very proud of them!

The DataFEWSion program is a National Research Traineeship sponsored by the National Science Foundation Division of Graduate Education. The project goals are:

- Foster interdisciplinary research based on data-intensive methods
- Educate STEM graduate students for a range of research, research-related and entrepreneurial careers employing data-driven modeling at the food, energy, and water system (FEWS) nexus.
- Prepare STEM graduate students to work effectively in multidisciplinary teams, communicate effectively with stakeholders, and identify economically sustainable innovations.

Selected Ph.D. trainees receive funding packages that cover tuition, living expenses, and health insurance for a year. We also have unfunded trainees, who are international or master’s students not eligible for this funding.

“We were a group with different people with different backgrounds. The fact that we were communicating our research and hearing different perspectives, that’s something very important, both in academia and industry. You have to communicate and try to understand other people.”

- Alum
The DataFEWSion traineeship starts with a strong foundation of the student’s research in the FEWS nexus. Layered over that is a graduate certificate with a focus on data analytics and decision making. To augment the certificate, a two-year series of workshops provide unique opportunities for professional development and interactions with stakeholders. The trainees document their learning in an ePortfolio. The learning community provides an environment to practice the skills learned and identify collaboration potentials. The annual symposium includes the external advisors, faculty, and the trainees. The most important part of a traineeship is the trainees, who are highly motivated and talented graduate students with a commitment to interdisciplinary collaboration.

**Series 1 workshops emphasize facilitating trainee understanding of and appreciation for the social, economic, and geographic context of the Midwest FEWS nexus, in particular, production agriculture, water quality, and bioenergy, as well as helping trainees to better understand the unique strengths that they bring as individuals to addressing FEWS issues.**

**Series 2 workshops emphasize communication skills and experiences to help trainees better understand diverse audiences that are relevant to their work, and build from there into modes of effecting change: entrepreneurship, policy-making, and transformative interdisciplinary research.**
“A lot of the skills that we developed were very just broad skills that you could apply to a career, whether you go to academia, whether you go to industry, whether you go into government or not... All those soft skills, you can apply them to anything.” - Alum

**Anticipated Career Paths**

*Numbers represent actual employment*

- **Academia**: 5
- **Industry**: 2
- **Entrepreneur**: 2
- **Public Sector**: N/A
- **Non Profit**: N/A

**FEWS Collaboration Potentials**

- **Food Production**
- **Biorenewable Energy**
- **Water Quality**
- **Data Analytics**
- **Policy, Econ. & Soc.**

**Travel/Publication Grants**

A travel and publication grant was added as an incentive in 2020. All students and alums were eligible to receive up to $1,000 per year to present at a conference, obtain additional training, or network at regional events.

<table>
<thead>
<tr>
<th>Year</th>
<th>Conferences Attended</th>
</tr>
</thead>
<tbody>
<tr>
<td>20-21</td>
<td>4</td>
</tr>
<tr>
<td>21-22</td>
<td>5</td>
</tr>
<tr>
<td>22-23</td>
<td>14</td>
</tr>
<tr>
<td>23-24</td>
<td>6 + 1 publication</td>
</tr>
</tbody>
</table>

(data represents all cohorts)
In this planning year, the leadership team recruited the first cohort of trainees while developing the traineeship components:

- establishing the Data-Driven Food, Energy, and Water Decision Making Graduate certificate;
- working with the Center for Communication Excellence to develop the communication class;
- planning the orientation program and first series of workshops and
- conceptualizing a learning community that would provide trainees with professional development and communication opportunities.

**Leadership Team**

**Sarah Ryan, PI**
Industrial & Manufacturing Systems Engineering
Operations research; data-driven decision models

**Robert Brown**
Bioeconomy Institute
Fuels, chemicals, and power from biomass

**Amy Kaleita**
Agricultural & Biosystems Engineering
Ag land and water resources conservation engineering

**Sergio Lence**
Economics
Ag economics, welfare and market analysis

**Michelle Soupier**
Agricultural & Biosystems Engineering
Water quality and watershed management

**Cameron MacKenzie**
Industrial & Manufacturing Systems Engineering
Decision and risk analysis
Year 2 began with orientation for the first cohort, where the trainees learned about leadership styles with Jen Leptien from ISU Learning Communities, who guided them through their Clifton Strengths Finder results. Orientation also included science communication and team-building activities. During the year, the weekly learning community was programmed around professional skills development and building interdisciplinary relationships, which included peer reviews on writing projects, discussions on their research, and chairing the meetings. The shutdown from the pandemic at the end of the spring semester in 2020 forced the cancellation of the first symposium and last workshop, delaying some community building and potential collaboration opportunities.

"I gained experience presenting my research in front of others, valuable feedback in relation to papers I was working on writing, and thoroughly enjoyed learning what other areas my fellow DataFEWSion peers were working on." - Trainee
In year 3, the second cohort joined the program. COVID precautions altered delivery modes but resulted in students planning the symposium and finding creative approaches to connecting. Three trainees from cohort 2 embarked on a collaboration project, resulting in at least two publications and sections in their dissertations.

The learning community focus shifted to trainees sharing their expertise through “teachable topics” including data management, statistical analysis with R, literature search in the Web of Science, GIS and Github, and digital soil mapping.

The 2021 Spring Symposium focused on “Building capacity to train PhD students for non-academic careers.” A virtual platform delivered a student poster session and 3-minute research videos, as well as conversation sessions on industry research and development, professional skills and Industry hiring/career paths. Networking activities were interspersed throughout.

“I have gained new perspectives on issues related to the FEWS nexus. I have learned about interesting and important FEWS issues I was unaware of.”

- Trainee
**Series 2: Effecting Change in the FEWS Nexus**

<table>
<thead>
<tr>
<th>Fall 2020</th>
<th>Topic</th>
<th>Presenters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aug</td>
<td>Orientation</td>
<td>Clifton Strengths Training, Science Communication</td>
</tr>
<tr>
<td>Sept</td>
<td>Decision Analysis</td>
<td>Cameron MacKenzie, Industrial and Manufacturing Systems Engineering</td>
</tr>
<tr>
<td>Oct</td>
<td>Stakeholders Engagement</td>
<td>David Peters, Sociology</td>
</tr>
<tr>
<td>Nov</td>
<td>Train Project Management Skills with Your Graduate Research</td>
<td>Shan Jiang, Materials Science and Engineering</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Spring 2021</th>
<th>Topic</th>
<th>Presenters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan</td>
<td>Symposium</td>
<td>Building Capacity to Train Students for Non-Academic Careers</td>
</tr>
<tr>
<td>Feb</td>
<td>Data Visualization</td>
<td>Anabelle Laurent, Agronomy</td>
</tr>
<tr>
<td>Mar</td>
<td>Radical Interdisciplinary Collaboration</td>
<td>Jim Reecy, VPR &amp; Jessica Bell, Translational AI Center</td>
</tr>
<tr>
<td>Apr</td>
<td>FEW Stakeholders Agriculture Policy</td>
<td>Keegan Kult, Agricultural Drainage Management Coalition</td>
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<tr>
<td></td>
<td></td>
<td>Ed Anderson, Iowa Soybean Association</td>
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<tr>
<td></td>
<td></td>
<td>Elizabeth Burns-Thompson, Renewable Energy Group</td>
</tr>
</tbody>
</table>

“The student presentations were fantastic. I think the ability to boil what you’re learning into three-to-five-minute videos is incredibly important.”

- Advisory board member

“I had many opportunities to develop my soft skills, social media communication, and meeting new students from other departments. I’ve met with faculty and industry researchers whom I would have never otherwise met.”

- Trainee
The learning community of cohorts 2 and 3 included topics led by students such as data sharing principles/ontologies, the logic of scientific discovery, life cycle assessment, dimensional analysis, tips and tricks with R, and writing reports with LaTeX. Other engagements included the screening & discussion of the film “Kiss the Ground,” a conversation with guest Beth Hoffman (author of Bet the Farm) and ISU Librarian Megan O’Donnell on ethics of data.

The 2022 Symposium “Harnessing the Data Revolution: Informed Policy for Society and the Environment” was held in person with a few remote participants. Keynote speaker John Crespi, Director of the Center for Agricultural and Rural Development, gave a thought-provoking presentation. The rest of the day included student presentations and posters, two data science workshops, and networking opportunities. Five new external advisory board members joined the event, along with four continuing ones.

“The best parts of the networking weekend was “Simply getting to know others in my cohort, building the team dynamics! I feel more comfortable reaching out to the fellows in my cohort and asking them research or personal questions.”

-Trainee
Series 1: Your Role in the FEWS Nexus
Round 2: 2021-2022

**Fall 2021**

**Aug**
- Orientation
  - **Presenters:** Clifton Strengths Training & Science Communication

**Sept**
- Career Paths and Planning Panel
  - **Presenters:** Erin Webb, Oak Ridge National Lab & Lawrence Mosely, Omni Analytics Group

**Oct**
- Networking Weekend
  - **Presenters:** Eldora Retreat Center
- Social Media Panel & Branding Workshop
  - **Presenters:** Julianne Kellogg, Washington State University & Adam Janke, NREM
  - Erin Wilgenbusch, Greenlee School of Journalism and Communication

**Nov**
- Collaboration: Building an interdisciplinary team
  - **Presenters:** Melissa Miller, Iowa Nitrogen Initiative

**Spring 2022**

**Jan**
- Symposium
  - **Presenters:** Harnessing the Data Revolution: Informed Policy for Society & the Environment
  - Rick Cruse, Iowa Water Center

**Feb**
- Water Quality Roundtable
  - **Presenters:** Matt Helmers, Iowa Nutrient Research Center & Sean McMahon, Iowa Agriculture Water Alliance

**Mar**
- Renewable Energy Roundtable
  - **Presenters:** Anne Kimber, ISU Electric Power Research Center & Bernie del Campo, ARTi Biochar

**Apr**
- Data Science Advanced Topics
  - **Presenters:** Brian Gelder, Agricultural and Biosystems Engineering

---

“**I learned a lot from the other students through skill shares and was grateful for the opportunities to interact with them. It was nice to have a chance to practice presenting in a friendly environment.**” - Trainee

“The side conversations with both students and advisory board members were fun, interesting, and informative. I also thought the speed networking to create the opportunities to ask advisory board members about their career trajectories was interesting and I think very useful for the students to hear.” - Trainee
At the orientation lunch, Cohort 4 met members of the earlier cohorts, the leadership team and faculty advisors. The learning community continued “teachable topics” and added tours and community service.

At the 2023 Symposium, Rob Anex of the University of Wisconsin-Madison, gave the inspiring keynote “Sustainable Technology DiFEWSion: Case Studies in Irrigation, Solar Power, and Diet.” The event also included two workshops: 1) Data: Structure and Management in a Multi-Agency Project, by Brandon Schlautman and Bo Meyering from The Land Institute and 2) Project Management: It’s Not All About the Math, by ISU Professor Michael Helwig. In addition to speed networking, participants constructed a connection board that resulted in multiple conversations extending beyond the conference.

Networking session appeared to be the most valuable aspect of the symposium as participants became better acquainted trying to analyze and overcome research challenges.”
- Advisory board member

“I have gained professional relationships, knowledge in areas to which I would not otherwise have been exposed, and have learned communication skills.”
- Trainee

Fatemeh Ganji, Michelle Soupir, Kyle DeLong, and Nicole Kling represented DataFEWSion at the 2022 NRT Annual Meeting at Virginia Tech

Decision analysis workshop with Cameron MacKenzie

Student poster session

Breakout session

Symposium connection board

Food at First community service
### Series 2: Effecting Change in the FEWS Nexus
Round 2: 2022-2023

<table>
<thead>
<tr>
<th>Fall 2022</th>
<th>Topic</th>
<th>Presenters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aug</td>
<td>Orientation</td>
<td>Clifton Strengths Training, Science Communication</td>
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<tr>
<td></td>
<td></td>
<td>Cameron MacKenzie, Industrial and Manufacturing Systems Engineering</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Eldora Retreat Center</td>
</tr>
<tr>
<td></td>
<td>Decision Analysis</td>
<td>Carmen Bain, College of Agriculture and Life Sciences Dean Office</td>
</tr>
<tr>
<td></td>
<td>Networking Weekend</td>
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<td></td>
<td>Stakeholders Engagement</td>
<td></td>
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<tr>
<td></td>
<td>Entrepreneurship in the FEW nexus</td>
<td>Kevin Kimle, Agricultural Entrepreneurship &amp; David Sly, Engineering Entrepreneurship Initiative</td>
</tr>
<tr>
<td>Nov</td>
<td></td>
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<tr>
<td></td>
<td>Spring 2023</td>
<td></td>
</tr>
<tr>
<td>Jan</td>
<td>Symposium</td>
<td>Harnessing the Data Revolution: Informed Policy for Society &amp; the Environment</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Anabelle Laurent, Corteva</td>
</tr>
<tr>
<td></td>
<td>Feb</td>
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<td></td>
<td>Mar</td>
<td>Robert Brown, Bioeconomy Institute</td>
</tr>
<tr>
<td></td>
<td>Apr</td>
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</tr>
</tbody>
</table>

**Building connections and exploring collaboration potentials at the networking weekend**

**Success at the orientation escape room!**

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“I thought that the team games were really important as they helped us bond in areas that were outside of our research. This helped us to really get to know one another better, as well as the way through which we may be able to collaborate on future projects.”

-Trainee
At the beginning of their second trainee year, the final cohort proposed an agenda for the weekly learning community meetings and an alternative way to complete their e-portfolio requirements. The twelve members of the cohort divided into four-member teams to collaborate on projects concerned with each of the three FEWS areas.

Each team aims to develop a product (e.g., interactive data visualization or economic evaluation) that will demonstrate each member’s attainment of the core competencies in each knowledge area of the certificate, to produce an online, interactive map linked to low-income communities.

### Series 1: Your Role in the FEWS Nexus

**Round 3: 2023-2024**

**Fall 2023**
- **Sept**
  - Career Paths & Planning Panel
  - Presenters: Greg Doonan, Corteva, Haleigh Summers, Sand County Foundation & Brandon Schlautman, The Land Institute

- **Oct**
  - Branding You and Your Research, Now & in the Future
  - Presenters: Erin Wilgenbusch, Greenlee School of Journalism and Communication

- **Nov**
  - Collaboration: Thinking Outside the Box
  - Presenters: Raj Raman ISU RegenPC & Laura Jarboe, ISU Chemurgy 2.0

**Spring 2024**
- **Jan**
  - Symposium
  - Presenters: When Disciplines Converge Innovations Emerge

- **Feb**
  - FEW Stakeholders -- Water Quality Panel
  - Presenters: Rick Cruse, Iowa Water Center & Sean McMahon, Iowa Agriculture Water Alliance

- **Mar**
  - FEW Stakeholders -- Bioenergy
  - Presenters: Jerod Smeenk, Frontline Bioenergy LLC. & Bernardo del Campo, ARTi Bio-char

- **Apr**
  - FEW Stakeholders -- Big Data & Food Chain Management
  - Presenters: David Blume, Hy-Vee & Clayton Mooney, Clayton Farms

---

“I felt that the discussion was very engaging throughout and was natural and flowed organically. I really enjoyed hearing the insights into an area that I was not as familiar with and the challenges and complexities of the area.”

- Trainee
FEWS Collaboration Projects

Food Production
Harvesting Harmony: A Data-Driven Inquiry into Food Inequity and Climate Impacts in Iowa
Nicole Kling
Angelos Lagoudakis
Logan Johnson
Júlia Brittes Tuthill

Renewable Energy
Piggybacking on the Sun: Examining the Efficiency and Economic Viability of Solar-based Microgrid Systems in Iowa
Alexandra Jean
Connor Thorpe
Elmin Rahic
Luke Soko

Water Quality
Weather Extremes in Iowa: Tracing the Impacts of Climate Change on Flooding and Drought
Emmanuel Padmore Mantey
Fatemeh Ganji
Taylor Vroman
Matt Kavanaugh
Under blizzard conditions, most of the students attended in person, while most of the advisory board members attended online. Our keynote speaker, Lisa Schulte Moore, joined us for an inviting “fireside” chat. Tom Lawler and Brian Bartle from Indigo Ag delivered a hybrid workshop on Carbon Removal Programs in Agriculture. And the student poster session and presentations on the progress of the collaborative projects rounded out the day.

“I enjoyed our first speaker [Lisa Schulte Moore]. She provided great insight on how to integrate social sciences/human dimension into the physical sciences/engineering. Extremely important topic!”

- Trainee

“I really enjoyed learning about the research that my fellow trainees have been conducting in the last year. I was also very excited to connect with other faculty and professionals who have been involved in the program, who may serve as valuable professional connections for the future.”

- Trainee
<table>
<thead>
<tr>
<th>Name</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alexandra Barron Jean</td>
<td>Enhancing Mass Transfer in Gas Fermenters for Production of Single Cell Protein</td>
</tr>
<tr>
<td>Angelos Lagoudakis</td>
<td>Food Choices and their Effect on Health and Nutrition: An Economic Investigation</td>
</tr>
<tr>
<td>Connor Thorpe</td>
<td>Identifying Factors that Determine Effectiveness of Delivery Agents in Biolistic Delivery Using a Library of Amine-Containing Molecules</td>
</tr>
<tr>
<td>Elmin Rahic</td>
<td>Bioprocessing Strategies to Valorize Perennial Biomass</td>
</tr>
<tr>
<td>Emmanuel P. Mantey</td>
<td>Cost Curves: A Novel Decision-Making Tool in The Water Industry with Focus on Water Reuse</td>
</tr>
<tr>
<td>Fatemeh Ganji</td>
<td>Implications of Climate Change Mitigation and Socioeconomic Development on the US Electric Power Sector</td>
</tr>
<tr>
<td>Júlia Brittes Tuthill</td>
<td>Harmonizing Iowa’s Resources: Modeling, Tool Development, and Data Synthesis for the IFEWs</td>
</tr>
<tr>
<td>Logan Johnson</td>
<td>Using a Machine Learning Approach to Predict Pork Loin Quality from Proteomic Data</td>
</tr>
<tr>
<td>Luke Soko</td>
<td>Farm Size Impacts Profitability of Anaerobic Digestion Renewable Natural Gas Projects</td>
</tr>
<tr>
<td>Matt Kavanaugh</td>
<td>Developing a Dynamic Planting and Harvesting Algorithm in order to Improve SMAP Soil Moisture Retrievals</td>
</tr>
<tr>
<td>Nicole Kling</td>
<td>Assessment and Promotion of Environmentally Sustainable and Healthy Dietary Patterns</td>
</tr>
<tr>
<td>Taylor Vroman</td>
<td>Microbial Communities as a Pathway to Improved Woodchip Bioreactor Design and Performance</td>
</tr>
</tbody>
</table>
Where are they now?

Chin-Yuan “Jeff” Chu
Assistant Professor
Tunghai University, Taiwan
Graduated 2022
Industrial Engineering

Görkem Emirhüseyinoglu
Senior Scientist
United Airlines
Chicago, Illinois
Graduated 2022
Industrial Engineering

Garrison Gunter
Masters Student
Chemical and Biological Engineering

“I liked the idea of working on a multidisciplinary team to learn about others’ research. I think there is a multiplicative effect when such diverse research is added together.” - Trainee
“To become more familiar with the entire picture of social, agriculture, and environmental problems using data analysis. To go beyond just focusing on one aspect when we know all three are closely related.”

- Trainee
“I learned a lot from the other students through skill shares and was grateful for the opportunities to interact with them. It was nice to have a chance to practice presenting in a friendly environment.”

- Trainee
Richard Magala
Ph.D. Candidate
Forestry

Tiffanie Stone
Postdoctoral Scholar
Agroecology
Aarhus University, Denmark
Graduated 2023
Environmental Science

Haleigh Summers
Agricultural Geospatial Data Scientist
Sand County Foundation, Iowa
Graduated 2023
Sustainable Agriculture & Environmental Science

“In DataFEWSion I had to lead a workshop and I have directly transferred those skills to what I’m doing now... I can look back and say, I’ve already basically done this before, but in a nice, controlled setting in school, where I was able to develop those skills and then apply them in these meetings.”
- Alum
"I wanted to be in an interdisciplinary team so I could help myself understand different aspects to why my research matters and how to make it useable for other disciplines."

- Trainee
Holly Loper  
Ph.D. Candidate  
Microbiology  
Graduating Spring 2024  

Jarrett Morrison  
Civil Engineer  
The Foth Co.  
Graduated 2023  
Environmental Engineering  

Gabrielle Myers  
Ph.D. Candidate  
Agricultural and Biosystems Engineering  
Graduating Spring 2024  

Kelly Nascimento Thompson  
Ph.D. Candidate  
Agricultural and Biosystems Engineering  

“This was a great experience that cannot be read in a textbook or simply told to. We learn how to interact with other humans, in different fields, with different backgrounds which is crucial as science, policy, and industry become more complex.”  
- Trainee
Where are they now?

Cohort 4: 2022-2024

Fatemeh Ganji
Ph.D. Student
Civil Engineering

Alexandra Barron Jean
Ph.D. Student
Chemical Engineering

Angelos Lagoudakis
Ph.D. Candidate
Economics

Emmanuel Padmore Mantey
Ph.D. Student
Civil Engineering

“I am hoping to build lifelong connections in research that will help to further my career. I am also looking to build my professional communication skills so that I am better prepared to succeed in the working world.”

- Trainee
“Scientists need to collaborate to successfully address and investigate different challenges in this field. Therefore, I believe that DataFEWSion Traineeship will be a good fit for me to broaden my horizon and perspective in collaborating with different experts regarding the water-energy-climate nexus research.”

- Trainee
Cohort 4: 2022-2024

Ph.D. Candidate
Agricultural and Biosystems Engineering

Elmin Rahic

Ph.D. Student
Agricultural and Biosystems Engineering

Luke Soko

Ph.D. Candidate
Agricultural and Biosystems Engineering

Julia Brittes Tuthill

Ph.D. Student
Environmental Science/Agricultural and Biosystems Engineering

Taylor Vroman

"It’s brought faculty from different parts of campus, different academic colleges, different graduate programs together in a new collaborative way. And it’s served as an example for others who might want to pursue a similar kind of program."

- Faculty
Awards

Angelos Lagoudakis
- Research Award. ISU Graduate and Professional Student Senate. 2024.
- Leadership Award. ISU Graduate and Professional Student Senate. 2024.
- Second place Policy Communications Competition - The Council on Food, Agricultural and Resource Economics and AAEA Graduate Student Section. AAEA Annual Meeting. 2024.
- Third place. Local Food Economics In-Person Data Visualization Challenge - USDA Agricultural Marketing Service and AAEA Graduate Student Section. AAEA Annual Meeting. 2023.

Logan Johnson
- Iowa Farm Bureau Graduate Fellowship. ISU College of Agriculture and Life Sciences. 2023.
- Research Excellence Award. ISU Graduate College. 2023.

Julia Brittes Tuthill
- Harold and Katherine Guy Graduate Fellowship. 2023 & 2024.
- Teaching Excellence Award. ISU Graduate College. 2023.

Fatemeh Ganji
- Science Communication Fellowship on Plants and Climate Change Education (PLACCE) Award. 2024.

Emmanuel Padmore Mantey

Alexandra Jean

Supported by Travel/Publication Grants

Haleigh Summers. Intersections of barriers to equitable food-energy-water system resources across the United States. 2023 International Association for Society and Natural Resources.


Fatemeh Ganji. Disparities in ambient air pollution exposure among the United States population amid climate change. American Geophysical Union Fall 2023 Meeting.

Emmanuel Padmore Mantey. Disparities in exposure to elevated nitrate within Iowa public water systems. American Geophysical Union Fall 2023 Meeting.

Angelos Lagoudakis. The role of dollar stores and food-away-from-home establishments on food systems in America. 2024 Midwest Economics Association Annual Conference.

Holly Loper. Impacts of agricultural management on ammonia oxidizing bacteria measured by phylogenetically diverse primers. American Geophysical Union Fall 2023 Meeting.


Taylor Vroman. Microbial Communities as a Pathway to Improved Woodchip and Corncob Bioreactor Design and Performance. 2024 Soil and Water Conservation Society International Annual Conference.

**Year 6 Publications**


**Bohn, Meyer & Miller, Bradley.** (2024). Locally enhanced digital soil mapping in support of a bottom-up approach is more accurate than conventional soil mapping and top-down digital soil mapping. Geoderma. 442. 116781. 10.1016/j.geoderma.2024.116781.


2023 Conference paper


Published papers from certificate coursework


## Faculty Advisors

<table>
<thead>
<tr>
<th>Name</th>
<th>Department</th>
<th>Advisor/Committee</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dan Andersen</td>
<td>ABE</td>
<td>Gabby Myers, C1</td>
</tr>
<tr>
<td>Sotirios Archontoulis</td>
<td>Agronomy</td>
<td>Gina Nichols, C1</td>
</tr>
<tr>
<td>Robert Brown</td>
<td>CBE</td>
<td>Garrison Gunter, C1</td>
</tr>
<tr>
<td>Gül Kremer</td>
<td>IMSE</td>
<td>Chih-Yuan “Jeff” Chu C1</td>
</tr>
<tr>
<td>Matt Liebman</td>
<td>Agronomy</td>
<td>Gina Nichols C1</td>
</tr>
<tr>
<td>Sarah Ryan</td>
<td>IMSE</td>
<td>Michelle Soupir ABE</td>
</tr>
<tr>
<td>Görkem Emirhuseynoglu</td>
<td>C1 Agronomy</td>
<td>Lindsey Hartfiel C1</td>
</tr>
<tr>
<td>Motahareh Kashanian</td>
<td>C3</td>
<td>Tim Neher C1</td>
</tr>
<tr>
<td>Alex Barron Jean</td>
<td>C4</td>
<td>Taylor Vroman C4</td>
</tr>
<tr>
<td>Elmin Rahic</td>
<td>C4</td>
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</tr>
</tbody>
</table>

"My graduate student is better prepared and using what she has learned to develop future dissertation projects. And I have made new Collaborations.”

- Faculty
“We were working on a FEWS project before my student joined with DataFEWSion and I think our perspective on the nexus has been broadened through participation with the NRT.”  - Faculty

Loulou Dickey C2  
Julia Brittes Tuthill C4  
Fatemeh Ganji C4

Tiffanie Stone C2  
Loulou Dickey C2

Haliegh Summers C2  
Richard Magala C2

DataFEWSion has allowed people to engage in a much more substantive way in ongoing conversations about the way that research is different in disciplines... and you hear how questions are framed differently when they’re coming from different places and different people. That type of informal interdisciplinarity, but consistent, over a longer time horizon, is probably even more powerful than the more formal, but very inconsistent interdisciplinarity that happens [elsewhere].”  - Faculty

Lisa Schulte Moore  
NREM

Richard Magala C2  
Gökrem Emrhuseyinoglu  C1

Chris Rehmann  
Civil Engineering

Janette Thompson  
NREM

John Tyndall  
NREM

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“The curriculum and their formalized programming really sets these students up for not just talking in the vacuum, not just talking in the echo chamber, but talking to people outside of their areas of study and the disciplines.”

-Faculty
Dissertations

Haleigh Summers. Identifying environmental, economic, and equity opportunities through a spatial lens. 2023.

Tiffanie Stone. Toward a more sustainable food system: environmental and social impacts of increasing table food production near cities in the midwest United States. 2023.


Lindsey Marie Hartfiel. Influence of denitrification bioreactor design on cost, performance, and potential for pollution swapping. 2022.

Görkem Emirhüseyinoglu. Insights from stochastic programs on aligning farmer profit motive with environmental goals. 2022.


Charles Jacob Labuzzetta. Practical methods for the advancement of precision conservation via land cover classification and conformal prediction. 2022.

Virginia Nichols. Anything but simple: using models and field studies to explore the effects of cropping system diversification in the upper midwestern United States. 2021.
External Advisory Board

“Without a doubt, it’s the maturity that the students gain in an interdisciplinary program that has expectations for performance. The workshop itself is one of those expectations. I could tell they really stepped up. There was even some initiative taken by the students that you wouldn’t normally see among some of those grad student communities. They have some self-driven project activities that continue through this year. That was neat to see.”

- Advisory board member

“It [the symposium] felt like a great opportunity for [my organization] to learn more about what students were interested in, what kind of research was happening at Iowa State. Energy and water are two of our biggest areas of focus in terms of our advocacy and our research and I think it’s important to us to be able to keep tabs on what exciting things are happening and to be able to figure out how we can help these students and faculty make connections, or how we can think of ways to make that research more relevant and apply what’s being learned with some of our partners and initiatives.”

- Advisory board member
With gratitude:
Vice President for Research
College of Engineering
College of Agriculture and Life Sciences
Graduate College Career Services and Center for Communication Excellence
Bioeconomy Institute
Department of Industrial and Manufacturing Systems Engineering
ISU Learning Communities
Rameshwar Kanwar ABE 585 instructor
And a special thanks to the faculty advisors who supported the program
And most of all, the students who helped shape an amazing experience

The project’s conclusion will coincide with the retirement of Cynthia Lidtke, who has coordinated all our activities. She has been the creative force behind our publicity, the glue that held the learning community together, and the primary point of contact for our workshop and symposium speakers, external advisors, and campus partners. We could not have done it without her!
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