

Notes from the Program Director

As our first cohort of trainees completed the two-year program, I tried to summarize their experience in some numbers:

- 40 (approximately) small group sessions devoted to peer review, workshop preparation, and exchange of research expertise and interests;
- 13 credits to complete the graduate certificate in Data-Driven Food, Energy and Water Decision Making;
- 11 workshops (the pandemic postponed the 12th one);
- 6 artifacts in each trainee's e-portfolio;
- 1 symposium, planned by a student-faculty steering committee.

Of course, the numbers fail to capture the collegiality, humor, purpose, and passion of these young professionals. I eagerly await their future contributions.

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

The project goals are:

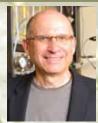
- Foster interdisciplinary research based on data-intensive methods
- Educate STEM graduate students for a range of research, research-related and entrepreneurial careers employing data-driven modeling at the FEWS nexus
- Prepare STEM graduate students to work effectively in multidisciplinary teams,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

Leadership Team



Sarah Ryan, Pl Industrial & Mfg. Sys. Engineering

Operations research; data-driven decision models



Robert Brown
Bioeconomy Institute

Fuels, chemicals, and power from biomass



Amy Kaleita
Ag & Biosystems Engineering

Ag land and water resources conservation engineering



Sergio Lence

Ag economics, welfare and market analysis



Michelle Soupir
Ag & Biosystems Engineering

Water quality and watershed management



Smiles during the first Zoom meeting in 2020



What is a Traineeship?

The DataFEWSion traineeship starts with the strong foundation of the student's research in the FEWS nexus. Layered on top of that is a graduate certificate with a focus on data analytics and decision making. To augment the certificate, a two-year series of workshops are offered, providing unique opportunities for professional development and interactions with stakeholders. The trainees document their learning in an ePortfolio. And finally, the heart of the traineeship is the learning community, where they practice the skills learn and look for collaboration opportunities. The most important part of a traineeship is the trainees, who are highly motivated and talented graduate students with a commitment to interdisciplinary collaboration.

Up to six Ph.D. trainees per year receive assistantships that cover tuition, living expenses, and health insurance for a year. We also have unfunded trainees, who are primarily international students not eligible for this funding.

DataFEWSion Graduate Traineeship Framework

Annual Symposium

Learning Community

Eportfolio

Workshops

Data-Driven Food. **Energy and Water Decision Making** Certificate

Research



FEWS Nexus

Communication

Entrepreneurship

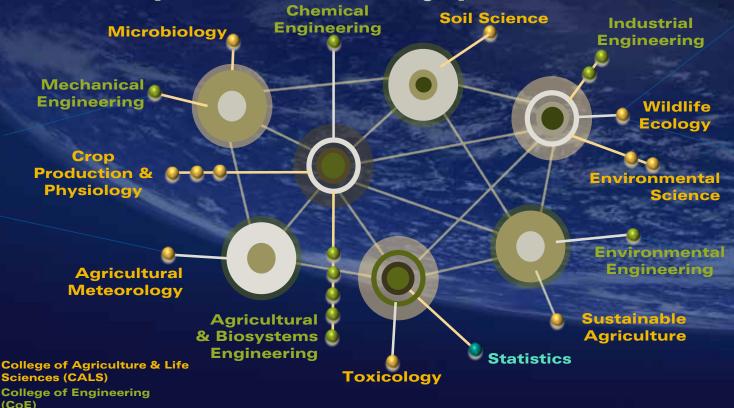
Data acquisition. visualization & analytics

Complex systems modeling for decision support

Economics, policy or sociology of FEWS

Trainee's research at the nexus of Food Production, Biorenewable Energy and Water Quality

Diverse Disciplines, Domains, Demographics, and Directions



Each dot represents a trainee

Sciences (LAS)

College of Liberal Arts &

FEWS Collaboration Potentials

Food
Production
Biorenewable
Energy
Water Quality
Data Analytics
Policy,



Anticipated Career Paths





Econ,& Soc









Cohort 2



Meyer Bohn

Dept: Agronomy Advisor: Bradley Miller

Research Interest:

Digital soil mapping techniques that optimize sampling design and improve geospatial analysis of remote-sensed data in concert with machine-learning to map the spatial distribution of soil properties in support of precision agriculture and environmental modeling.



Loulou Dickey

Dept: Environmental Eng. Advisor: Chris Rehmann

Research Interest:

Function and performance of water quality practices in lowa; saturated riparian buffers and bioretention cells; urban and rural water quality issues and the intersection of FEWS; improving lowa's waters and increasing awareness about water quality issues through education and community outreach.



Rachel Sorensen

Dept: Toxicology/Natural Resource Ecology and Management (NREM) Advisor: Boris Jovanovic

Research Interest:

Testing the toxicity of PVC-based microplastics, nanoplastics and commonly used plasticizers on D. melanogaster.



Richard Magala

Dept: Ecology/NREM Advisor: Lisa Schulte Moore

Research Interest:

Landscape ecology to advance science in decision-making through ecological modeling to bolster environmental sustainability; to understanding how People in Ecosystem and Watershed Integration (PEWI) can be used to promote multi-functional ecosystem landscapes.



Tiffanie Stone

Dept: Env. Sci/NREM Advisor: Janette Thompson

Research Interest:

Developing models to integrate local food systems, climate dynamics, built forms and environmental impacts into the urban food, energy, water system (FEWS) nexus; to analyze and visualize sustainability from environmental, economic, and socio-political perspectives; to understand how to design for equity and in urban food systems.



Haleigh Summers

Dept: Sustainable Ag/NREM Co-advisors: John Tyndall & Emily Zimmerman

Research Interest:

Using geospatial and economic data to enhance spatial targeting of conservation practices across the state of lowa.



Year 3

During our planning year, we established a graduate Year 1 certificate, hired a project manager and recruited eight trainees.

The first cohort developed professional skills and built Year 2 interdisciplinary relationships through the learning community and the first workshop series: Your role in the FEWS Nexus.

> The second cohort of six new trainees were welcomed and joined cohort 1 in the learning community, workshop series 2: Effecting Change in the FEWS Nexus, the first Symposium, and the newly developed communication course. During COVID meetings were through Zoom and hybrid apportunities.

The third cohort of six new trainees will join cohort 2 in the Year 4 learning community activities and the second round of workshop series 1: Your role in the FEWS Nexus.

The final cohort will join cohort 3 in the learning community Year 5 and workshop activities and the leadership team will plan for institutionalization.

Wrap up training cohort 4 and implement plans for Year 6 institutionalization.

9/1/2019

9/1/2018

9/1/2020

9/1/2021

9/1/2022

9/1/2023

9/1/2024

Year 3 Highlights



individual devalopment plan __ reflective Matering

Cohort 2 Orientation



Orientation began with face shields, masks, and social distancing while learning about the program from Dr. Ryan, each other, and our strengths as a team.



And ended outside with smiles while social distancing and having lunch with cohort 1

End of year celebration





Elizabeth Burns-Thompson – REGI Keegan Kult – ADM Coalition

ACTUALITY

Policy Roundtable

April 2021



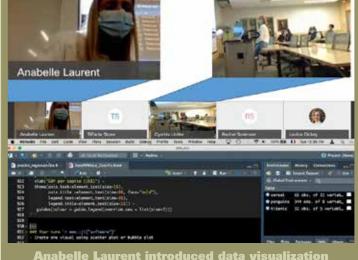
A lively discussion with the policy panel --Ed Anderson/Soybean Assn, Keegan Kult/ADM Coalition & Elizabeth Burns-Thompson/REGI



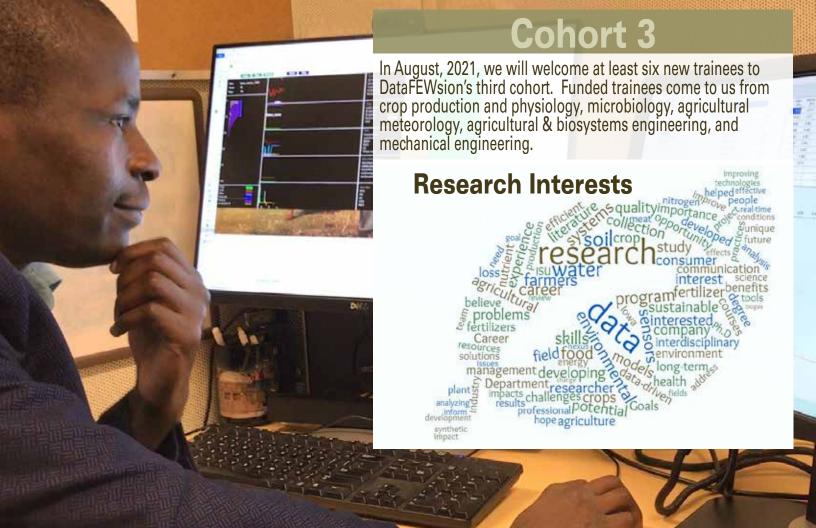
Waving goodbye to Jim Reecy and Jessica Bell after the Conflict in Collaboration Workshop



Reviewing the result from a Decision Modeling Simulation with Cameron MacKenzie



Anabelle Laurent introduced data visualization concepts and R packages in a hybrid face-to-face and online session



Faculty Advisors



Sotirios Archontoulis Robert Brown Agronomy





Boris Jovanovic Gül Kremer Toxicology 7



IMSE



Matt Liebman Agronomy



Bradley Miller Agronomy



Chris Rehmann Civil Engineering



IMSE



Sarah Ryan Lisa Schulte Moore Natural Resource Ecology & Management





Michelle Soupir Janette Thompset





John Tyndall 👟 Zhengyuan Zhu 🗸 Emily Zimmerm



Statistics Natural Resource Ecology & Managelo



Industry **Advisory Board**

INFR/ILYTIKS Making Data Meaningful



Akash Vidyadharan Founder & Chief Technology Officer

Greg Doonan Head of Novel Algorithm Advancement





Hassan Loutfi **R&D** Manager

Frank Dohleman





CEO

Kara Hobart Senior R&D Engineer

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Any opinions, findings and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the NSF.



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