Transforming Graduate Education

- Engagement
  - Monthly discussions with graduate chairs
  - Roundtables with graduate students

- New credentials
  - Certificates
  - Specializations
  - Digital badges

- Exploring innovative models:
  - Recruitment
  - Professional development (FFAR Program)
  - Internships
  - Funding
  - Partnerships

Vision: Every graduate student is inspired and empowered to make a difference in a complex and diverse world.

Shared mission of IANR’s faculty and staff (ARD, Extension, CASNR, CEHS, and IANR Global Engagement).

Integration Across Learning Experiences

Learning and Experiences Transcend the Campus Footprint

Individualized Educational Experience Co-created by the Learner

Mentoring and Professional Development

Broaden Career Pathway Exploration through Partnerships

Holistic Approach Connecting Student Interests to Diverse Career Pathways

https://casnr.unl.edu/framework-graduate-education
Re-engaging
IANR’s
Six Communities

January 11 Chancellor’s visit with the communities
Produce future STEM professionals

Equip and empower the general public
A scientifically literate society capable of making effective decisions grounded in STEM-informed analyses of complex, real-world challenges associated with food, fuel, water, landscape, and societal issues.
Leadership Structure
Science Literacy Impacts since 2013

- 4,500 Students Experienced SCIL 101
- 700 Activity Insight accomplishments indicated a science literacy focus
- 5 Million In grant funding supporting Science Literacy efforts
- 56 Nebraska’s counties have Extension staff that have identified Science Literacy as a primary focus and are connecting to schools and other youth programs.

USDA-NIFA REEU funded projects with focus on science literacy outputs
Science Literacy (SCIL 101): Science and Decision-making for a Complex World

A classroom model to promote students’ science literacy

Jenny Dauer, Assistant Prof, SNR
We need to prepare scientifically literate students to make good decisions related to these issues:
What does “science education to improve student decision-making” look like?
Teach student science content knowledge and they will make better personal and civic decisions
Current decision-making models

Teaching science content knowledge isn’t enough to develop science-informed decision-making skills.

Kollmus & Agyeman, 2002

National Academy of Sciences, Engineering & Medicine, 2016
SCIL 101

Introductory core course required by all majors in CASNR
~600 students per year

60% STEM majors, 40% non-STEM

Most common majors:
Animal Science 14%
Agribusiness 10%
Agronomy 8%
Fisheries & Wildlife 8%
Ag Economics 6%
Forensic Science 6%
(the remaining 48% comprises 28 other majors)
Science and decision-making for a complex world

Dauer & Forbes 2016; Dauer et al 2017; Dauer & Alred 2018; Sabel 2017; Sutter 2018
Fast thinking has its place & importance, but when it’s really important that we don’t make a mistake – slow thinking is better.
A quality decision depends on the quality of the process by which it is made and displays:

1. The ability of the decision-maker to interpret and apply scientific information to a decision.
2. The final choice reflecting priorities that result from evaluation of tradeoffs.

Structured decision-making framework

1. Define the Problem

2. List Possible **Options**

3. **Criteria**: How are you going to choose between the options? Explain important considerations and what is *valued* in an outcome.

4. Information

5. Tradeoffs Analysis

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Option #1</th>
<th>Option #2</th>
<th>Option #3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Criteria #1</td>
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<tr>
<td>Criteria #2</td>
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<tr>
<td>Criteria #3</td>
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</tbody>
</table>

6. **Choice ("Decision")**: Which option did you choose?

7. Review

PrOACT model adapted from Ratcliff, 1997 and Hammond et al., 1999
We have found learning gains in terms of:
• writing arguments that are supported by scientific evidence
• socioscientific reasoning
• civic attitudes and skills
• library self-efficacy
• scientific habits of mind
• Identifying valid arguments
• Evaluating validity of sources

“This course really developed my thinking skills about issues that concerns more than one side who are affected by the issue.”

“I was relating scientific information to problems, and learning how to use it effectively, which is really useful.”
Since Fall 2014
Instructors:
Dennis Ferraro
Liz VanWormer
Brandi Sigmon
Amanda Sorensen
Louise Lynch
Christian Elowsky
Cory Forbes
Tom Powers

Learning Assistants:
45 grad students
28 undergrads
6 post-docs/faculty

Research team:
Amanda Sorensen
Citlally Jimenez
Ashley Alred

Undergrads:
Alese Sanders
Blaine Meyer
Jena Wilson
Madeline Eischen

NSF IUSE:
1711683
Immersive Educational Game Simulations to Enhance Understanding of Corn-Water-Ethanol-Beef System Nexus
Project Goals

Research-based models

Systems Thinking
Ag Literacy
STEM Careers
Sustainability
Integrated Modeling:
Deepak Keshwani, Jeyam Subbiah

Crop Modeling:
Haishun Yang

Weather: Mike Hayes, Clinton Rowe, Rezaul Mahmood

Sustainability: Richard Koelsch

Economics: David Rosenbaum, Eric Thompson, Cory Walters

Education:
Jenny Keshwani
Ashu Guru
Changsoo Song
Brandy VanDewalle

Beef
Luis Tedeshi (TAMU), Galen Ericson

Graphics:
Colleen Syron

Water: Suat Irmak

Integrated Modeling:
Deepak Keshwani, Jeyam Subbiah
Student Involvement

**Graduate Students**
Ryan Anderson (BSE)
Nathan Rice (BSE)
Luke Monhollon (BSE)

**Undergraduate Students and Part-time Workers**
Jake Eiserman (GRPH)
Conner Lunn (BSE)
Dipal Bhandari (CS)
Ben Buckwalter (HS)
Capri Keller (CIVE)
Alli Hauger (BSE)
Zecheng Li (CS)
Tomo Bessho (CS)

**Raikes Senior Design (CS)**
J.P. Fowler
Tanner Morino
Brodin Collins
Austin Baade
Randy Widener
Nick Jay
Hakim Noralahyadi
Integrated Model

Client

Request

Response

REST Web Services

Models Pipeline

DSSAT

GREET

BCNRM

Data Repository
Define and identify corn-water-ethanol-beef system elements
Extrapolate impact of individual element on system interactions
Relate game theory to agricultural sustainability
Predict and analyze how decision making occurs as a group versus as an individual
Project Goals

Food
Energy
Water

DEMAND
GREET
BCNRM
RESOURCES

Research-based models

Systems Thinking
Ag Literacy
STEM Careers
Sustainability
SUMMARY & FUTURE PLANS
A scientifically literate society capable of making effective decisions grounded in STEM-informed analyses of complex, real-world challenges associated with food, fuel, water, landscape, and societal issues.
All Nebraska students have at least one Science Literacy experience

Expand collaborations and partnerships

Every relevant discovery packaged for consumption by appropriate audiences
Science Literacy Community Meeting
Thursday, February 7th
Arbor Room, East Campus Union
Together, we will build the momentum needed to make a difference in the lives of Nebraskans and citizens worldwide.
Welcome New Faculty
Since Sept. 2018
All Hands Meeting
Welcome
New Staff
Hired Since Sept. 2018
All Hands Meeting
Tiffany Heng-Moss, who has served as interim dean of the University of Nebraska–Lincoln’s College of Agricultural Sciences and Natural Resources since July 2017, has been named permanent dean of the college.
IANR
New Leaders

John Ruberson
Entomology

Cindy Zluticky
Metro District

Jessie Brophy
External Engagement and Special Events
Can you imagine?
N150 Core Aspirations

• Nebraska students co-create their experience.
• Our research and creativity transforms lives and learning.
• Every person and every interaction matter.
• Engagement builds communities.
Celebrate Nebraska 150
Charter Week, Feb. 11-15
Glow Big Red, Feb. 14

https://n150.unl.edu/
Chancellor’s Strategic Planning Task Force on Budget Model

- Implement a ‘hybrid’ Responsibility-Centered Management (RCM) budgeting process – as recommended by the [April 13, 2017 Budget Task Force Report](#)
- Refine business/HR functions to enhance success of core academic missions
IANR facilities allow teaching, research, and engagement to come together.
Dairy Store shift

Gnotobiotic Mouse Vivarium addition
Public and private partnerships enhance the important work of IANR.
Public/ Private Partnerships
Starting from the best possible place.
Update on IANR Budget

Recent events

SEPTEMBER  No tuition increase

OCTOBER  Nebraska Economic Forecasting Advisory Board met and raised revenue projections

NOVEMBER  Governor Ricketts re-elected;
           No mid-year rescission

DECEMBER  Federal shutdown begins

JANUARY  Online sales tax collected;
         Unicameral began 90-day session;
         Governor released state budget;
         Federal shutdown ends

On the radar

FEBRUARY 28  Nebraska Economic Forecasting Advisory Board meets and releases state revenue budget projections

MARCH 4  NU Appropriations Committee Hearing
<table>
<thead>
<tr>
<th>Core Operations</th>
<th>NU Request</th>
<th>Governor's Budget</th>
<th>NU Request</th>
<th>Governor's Budget</th>
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<td><strong>Compensation</strong></td>
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<td><strong>Core Operations Total</strong></td>
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<td>21.7</td>
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</tbody>
</table>

Biennial request did not reflect all of the needs of the University.
N150 Core Aspirations

• Nebraska students co-create their experience.
• Our research and creativity transforms lives and learning.
• Every person and every interaction matter.
• Engagement builds communities.
IANR’s Six Communities

- Drivers of Economic Vitality for Nebraska
- Healthy Humans
- Healthy Agricultural Production and Natural Resources Systems
- Stress Biology
- Computational Sciences
- Science Literacy
IMPACT

Students

Staff

Faculty

Society

REC’s

Centers

Research Sites

Program Units

NU Wide Institutes

Academic Units

IANR Senior Leadership Team
By focusing on the success of our people, being accessible, equitable, diverse & inclusive, being an engaged university, through authentic partnerships, we will make a difference in the world.
“Land-grant institutions, contrary to some popular beliefs, are not merely about agricultural development, but rather about changing the world in a positive, meaningful, and enduring way. Land-grant institutions perhaps best represent the very core of what greatness means in American society--namely, equal opportunity for all and, through it, the chance to make our society and the world a better place in which to live.”

-The Modern Land-Grant University, 2014