# Sustainability Sub-Council
# Spring 2022

March 30, 2022

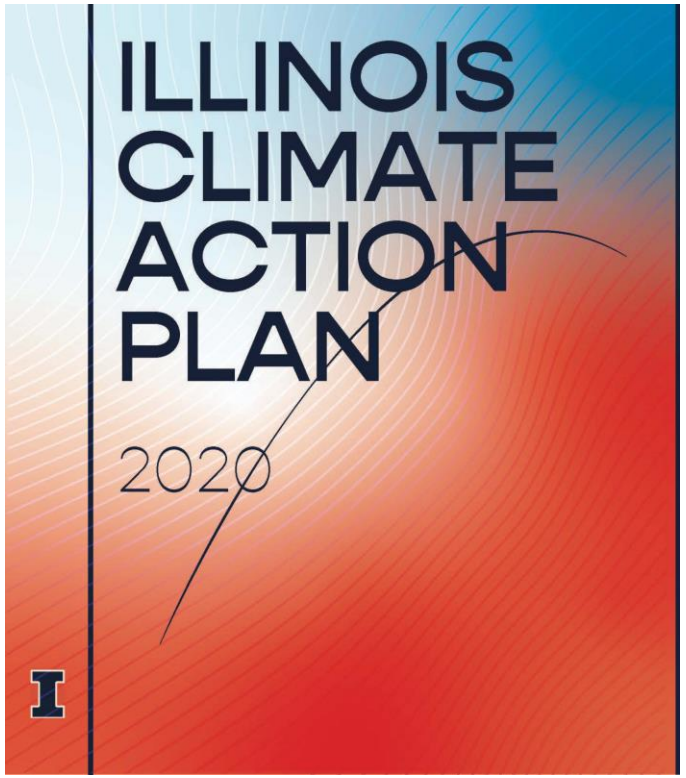
UNIVERSITY OF ILLINOIS URBANA-CHAMPAIGN

Institute for Sustainability, Energy, and Environment (iSEE)

# Sustainability Sub-Council

## Members of Sub-Council

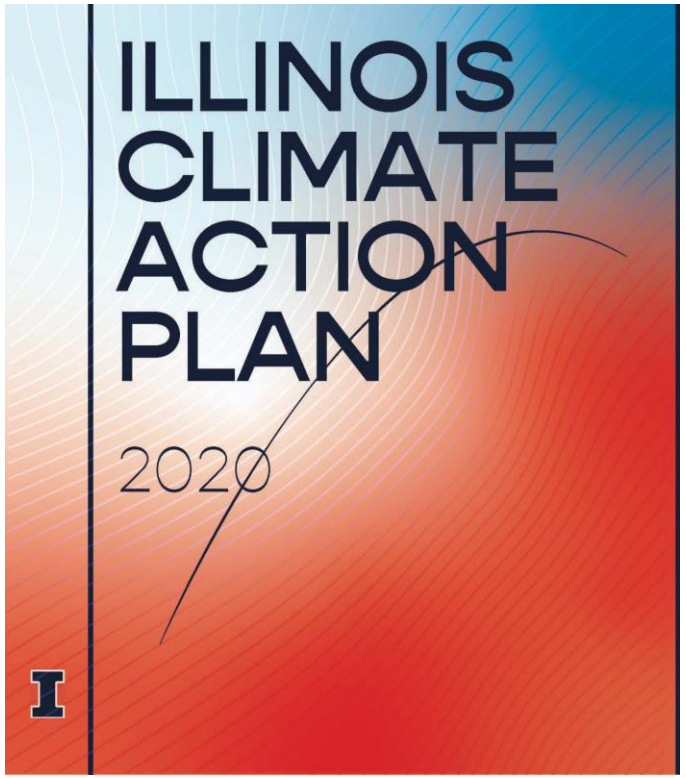
- Vice Chancellor for Administration and Operations: Mike DeLorenzo
- Vice Chancellor for Research and Innovation: Susan Martinis
- Associate Vice-Chancellor for Auxiliary, Health & Well-Being: Lowa Mwilambwe
- Associate Provost for Capital Planning: Paul Redman; Proxy: Brian Bundren
- Interim Director of iSEE: Madhu Khanna
- Interim Executive Director of F&S: Ehab Kamarah
- iSEE Associate Director for Campus Sustainability: Jennifer Fraterrigo
- F&S Associate Director for Sustainability: Morgan White
- Student Sustainability Leadership Council rep: Owen Jennings
- Admin: Meredith Moore, Sustainability Programs Coordinator



# Sustainability Sub-Council

## Invited Guests

- Adam Davis, Crop Sciences
- German Bollero, ACES
- Kim Kidwell, Associate Chancellor
- Brent Lewis, University Landscape Architect
- Jessica Nicholson, undergraduate student
- Bill Stewart, Recreation, Sports, and Tourism
- Luis Rodriguez, iSEE Associate Director for Education and Outreach
- Jeremy Guest, iSEE Associate Director for Research
- Eric Green, iSEE
- Elizabeth Murphy, Managing Director of iSEE



# Agenda

- Introductions
- Sustainable Land Management Plan
- Waste Reduction Strategies
- Updates
  - Campus Landscape Master Plan
  - Sustainability in Gen Ed requirements
- STARS → Shifting to Platinum

# Sustainable Land Management Plan

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# Charge to SLM Committee

A. *Sustainable land management practices*: develop plan for evaluating and inventorying sustainable land management practices on the South Farms on non-research land, and for increasing the sustainability of South Farms land management practices.

B. *Agronomy Handbook*: develop plan for updating the UIUC Agronomy Handbook with best management practices for sustainable land management.

C. *Outreach with university tenants:* Work with interested tenants on University-owned land to showcase selected sustainable land management practices in the updated Agronomy Handbook.

# Sustainable Land Management

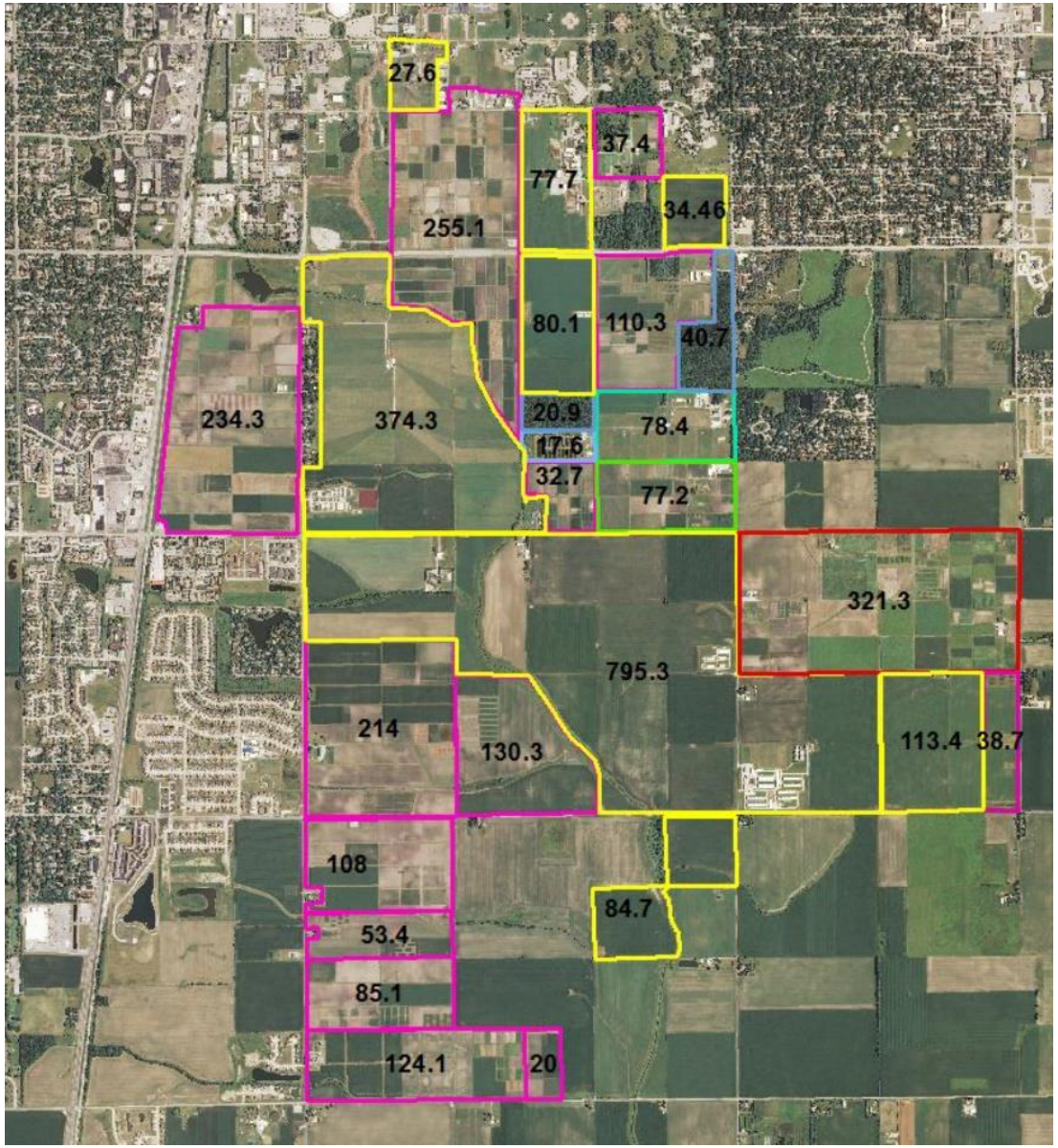

## Dr. Adam Davis

***Department Head of Crop Sciences and Chair of SLM Committee***

College of Agricultural, Consumer & Environmental Sciences

# Campus Research Farms

| Department | Acres |
|---|---|
| Animal Sciences: | 1508 |
| Crop Sciences: | 1654 |
| Field crops | 1233 |
| Fruit & Veg | 110 |
| Energy Farm | 321 |
| Research | 900 |
| Fill | 654 |
| Ag Biosystems Eng: | 77 |
| Total | ~3300 |

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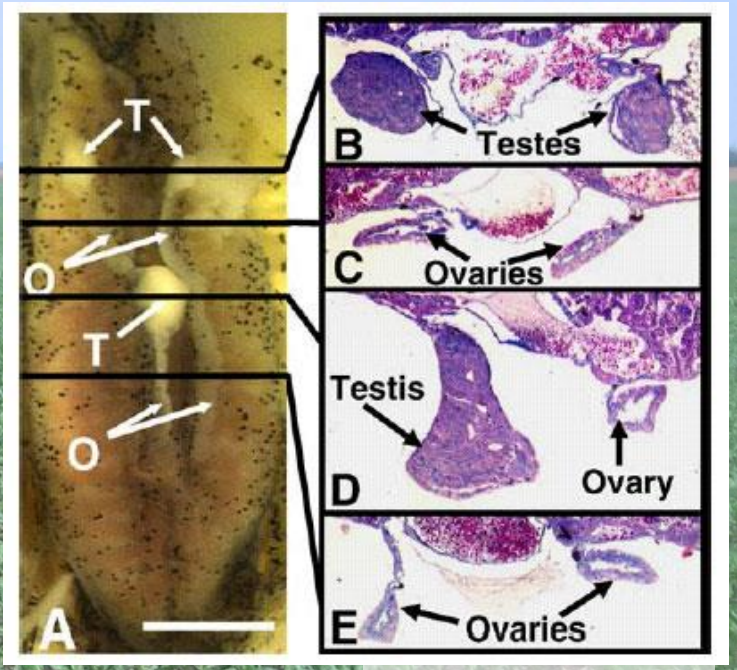
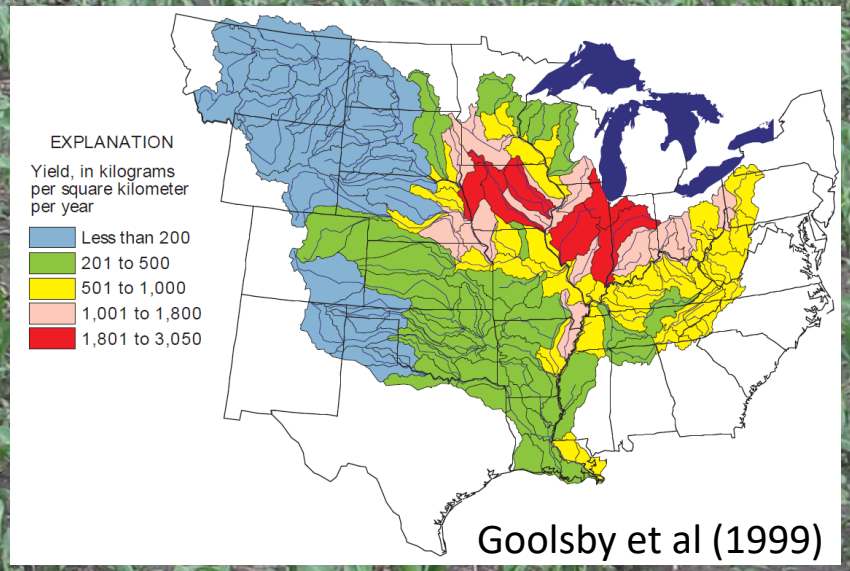
5/11/17, Sidney IL

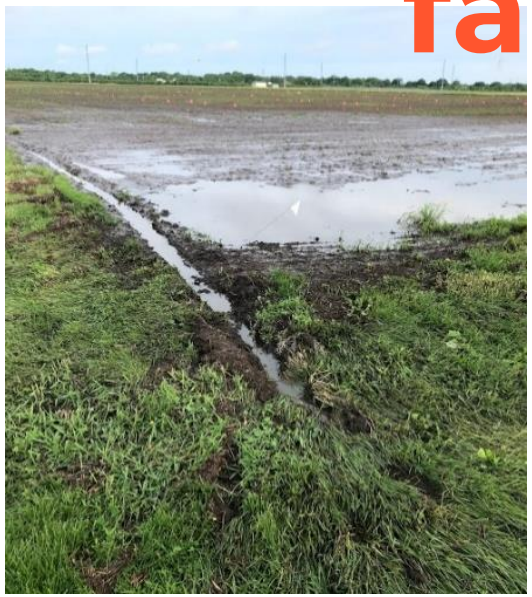



Hayes et al (2002)




Goolsby et al (1999)

# Soil degradation on campus → faculty consider using **off campus** farms



Waterlogging & Erosion
Poor access to irrigation

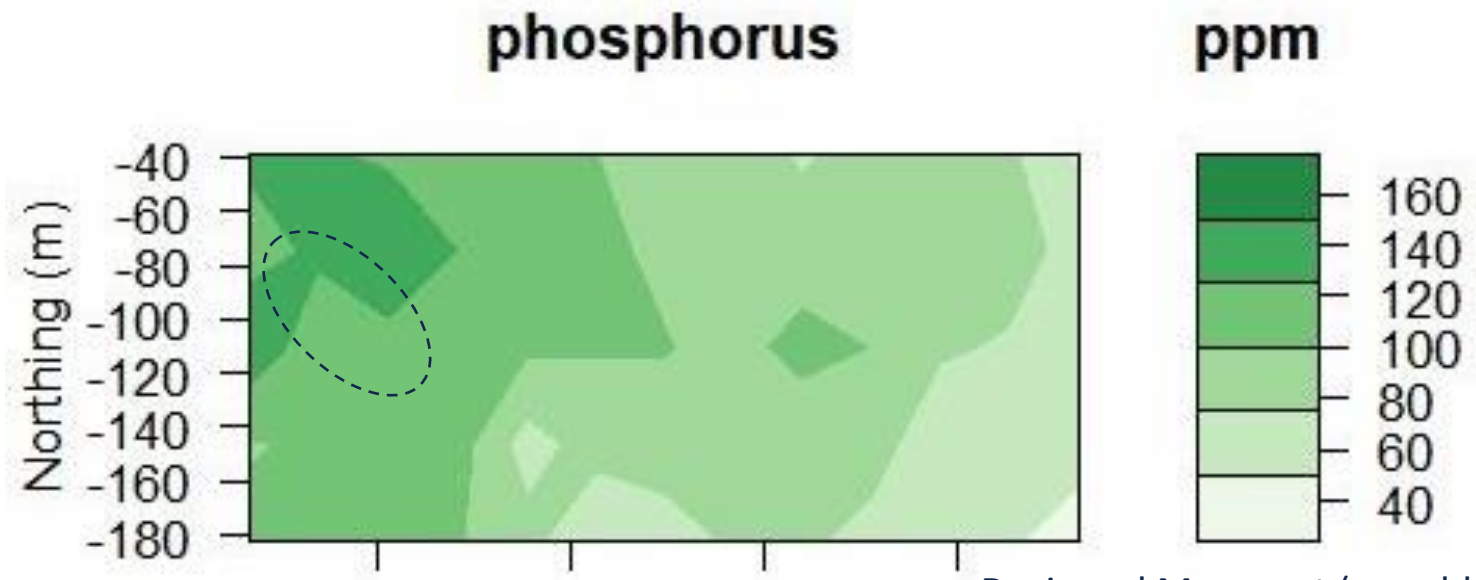
Compaction

Degraded structure & nutrient content

Photos: M.M. Williams

# Managing Animal Waste

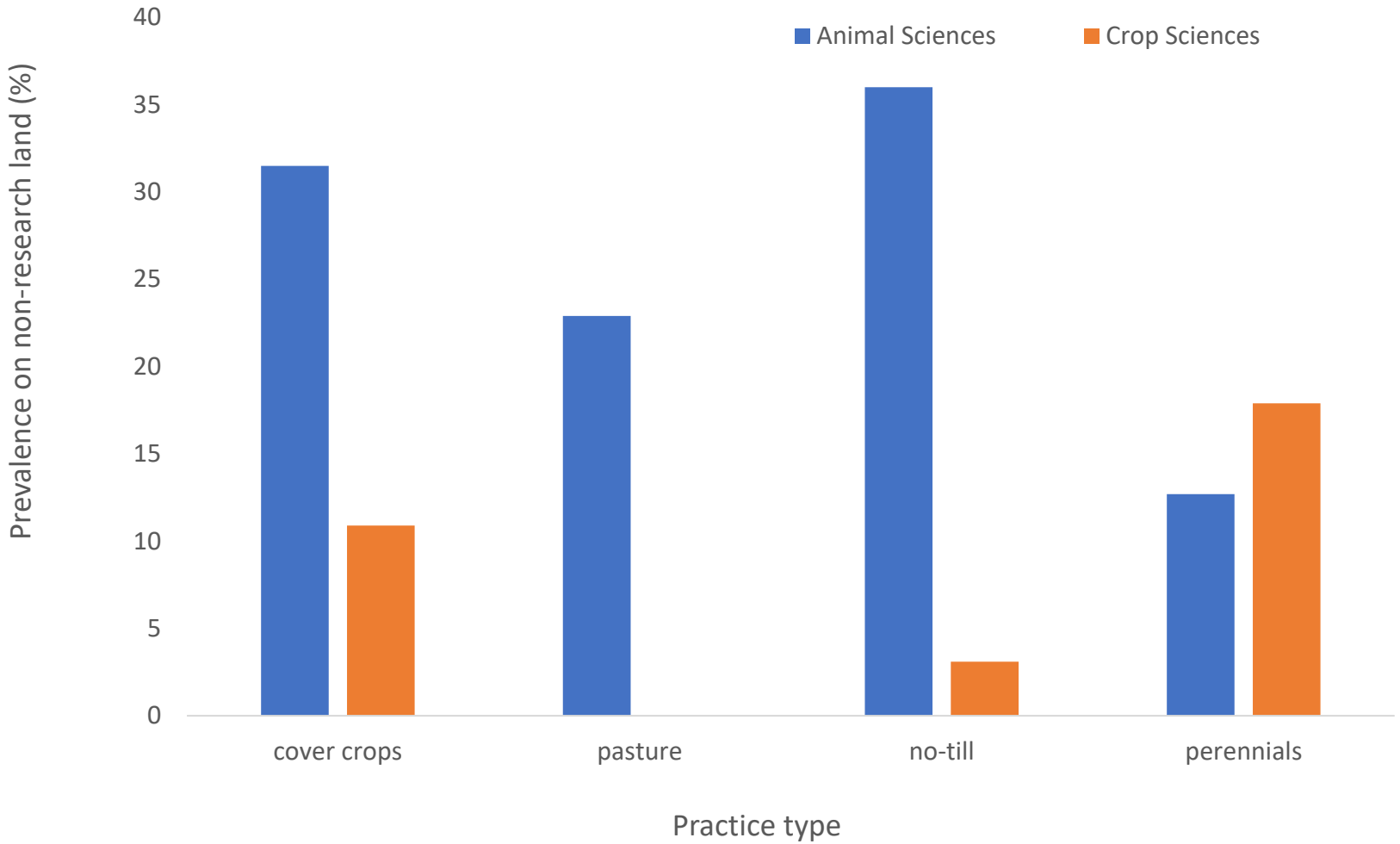
## Area to southeast of Dairy Farm →




Davis and Margenot (unpubl.)

# Sustainable management on Campus Research Farms

# Inventory of current soil and vegetation practices associated with sustainability (non-res. land)




Jan. 2022

## Priority Practice 1: compost manure

- Benefits:
  - volume reduction
  - odor reduction
  - kills bacteria & weed seeds
  - nutrient stabilization
  - build SOM/structure
  - reduce N fertilizer cost
- Costs:
  - pile management
  - spreading
  - compost turner ($25-$80K)
- Timeline: 18-36 mo.

# manure + organic residues + turning + time = **compost**

**windrow management**

# Priority Practice 2: cropping system diversification

- Benefits:
  - reduced loss of soil and nutrients
  - pest suppression
  - reduced reliance on synthetic inputs
  - yield/climate resilience
  - additional working days
- Barriers/constraints
  - fill/research: must avoid soil legacies
  - lost grain income (will vary)
  - additional field ops (cc: $22,500 over 900 acres)
  - seed/input costs ($60 to $150/acre)
  - drainage issues
- Timeline: 2-4 years

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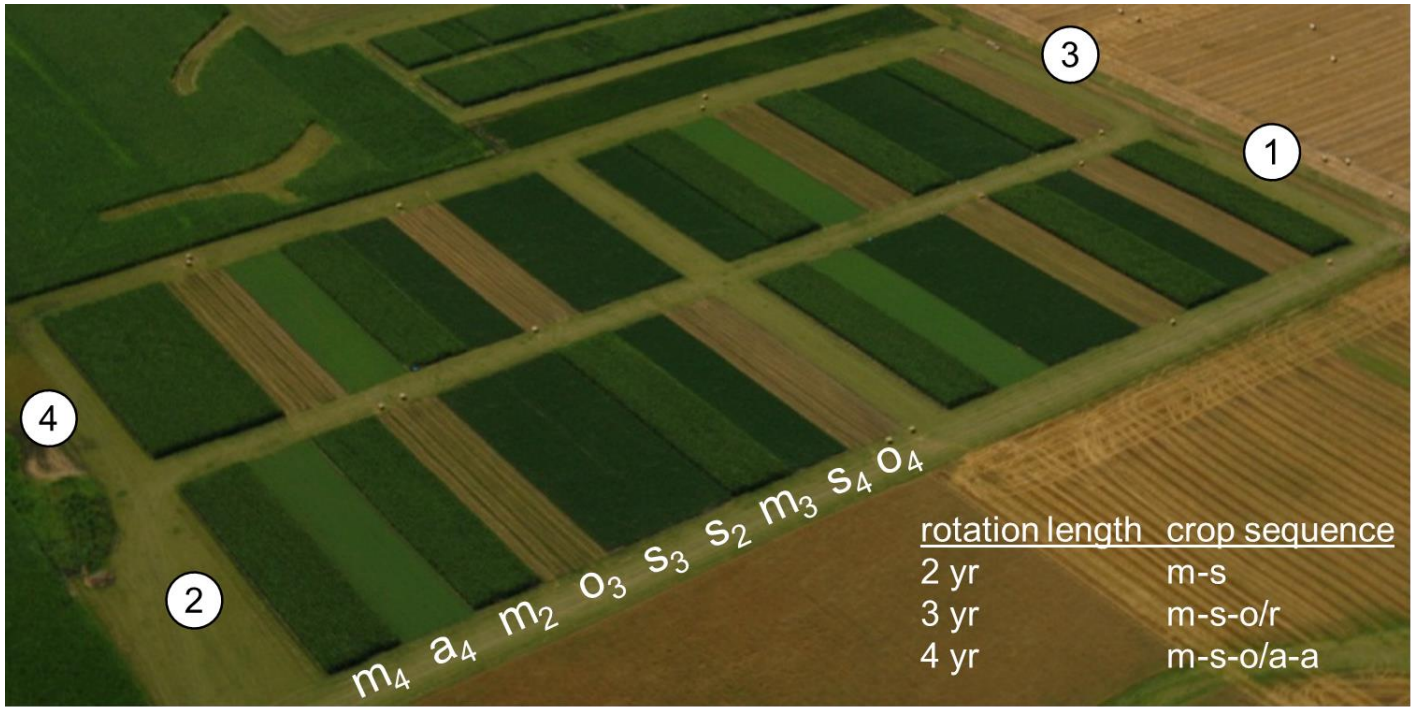
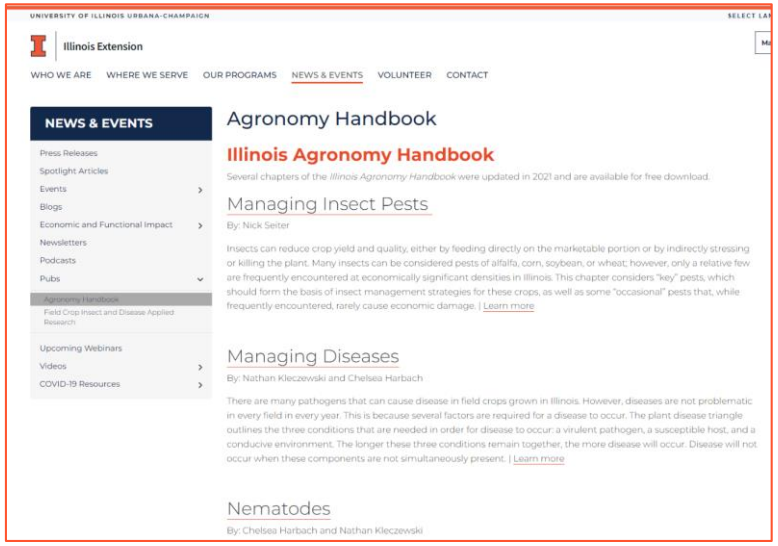
- continuous living cover
  - cover crops (gateway practice)
- extended rotations
  - more crop species diversity
  - all entry points present

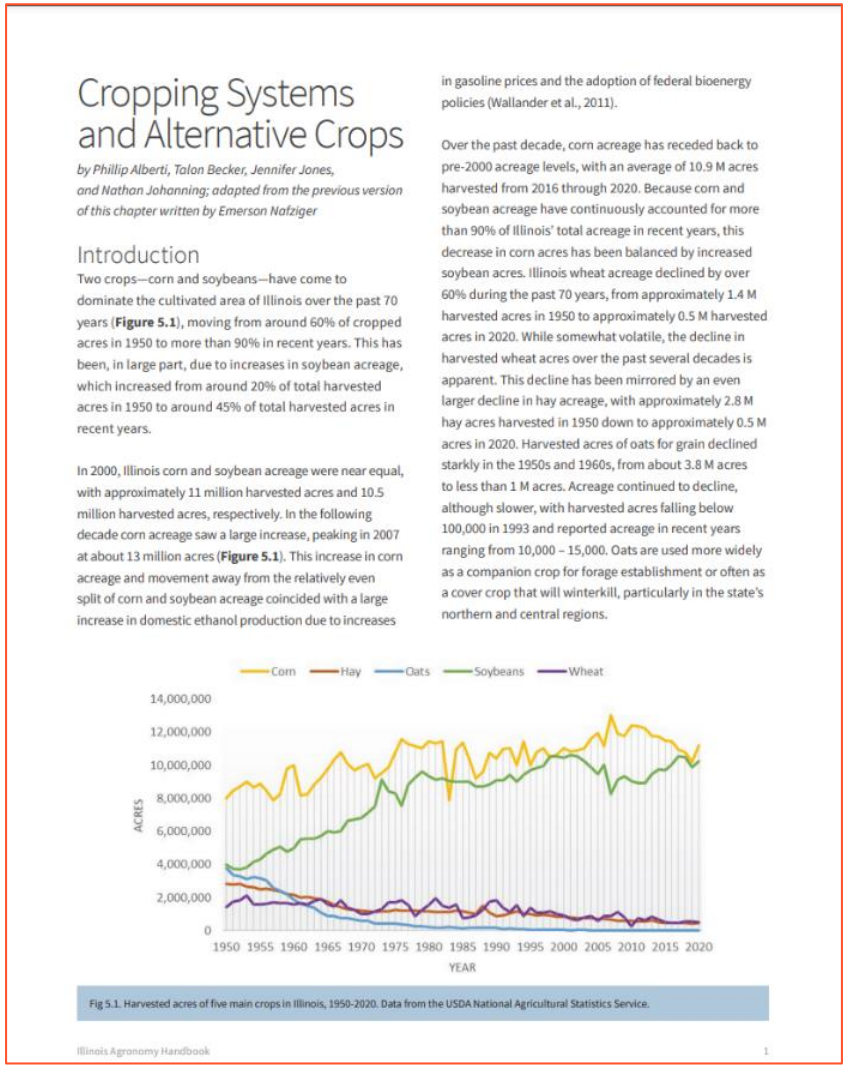



Davis et al. 2012 PLOS ONE 7(10): e47149

# Priority Practice 3: Agronomy Handbook chapter on SLMPs

- Benefits:
  - Integrated systems approach
  - Focus on implementation and adoption pathways
  - Aid both landowners and tenants
- Costs:
  - Postdoc for 3 months (approx. $25K)



## Cropping Systems and Alternative Crops

*by Phillip Alberti, Talon Becker, Jennifer Jones, and Nathan Johanning; adapted from the previous version of this chapter written by Emerson Nafziger*

### Introduction

Two crops—corn and soybeans—have come to dominate the cultivated area of Illinois over the past 70 years (**Figure 5.1**), moving from around 60% of cropped acres in 1950 to more than 90% in recent years. This has been, in large part, due to increases in soybean acreage, which increased from around 20% of total harvested acres in 1950 to around 45% of total harvested acres in recent years.

In 2000, Illinois corn and soybean acreage were near equal, with approximately 11 million harvested acres and 10.5 million harvested acres, respectively. In the following decade corn acreage saw a large increase, peaking in 2007 at about 13 million acres (**Figure 5.1**). This increase in corn acreage and movement away from the relatively even split of corn and soybean acreage coincided with a large increase in domestic ethanol production due to increases in gasoline prices and the adoption of federal bioenergy policies (Wallander et al., 2011).

Over the past decade, corn acreage has receded back to pre-2000 acreage levels, with an average of 10.9 M acres harvested from 2016 through 2020. Because corn and soybean acreage have continuously accounted for more than 90% of Illinois' total acreage in recent years, this decrease in corn acres has been balanced by increased soybean acres. Illinois wheat acreage declined by over 60% during the past 70 years, from approximately 1.4 M harvested acres in 1950 to approximately 0.5 M harvested acres in 2020. While somewhat volatile, the decline in harvested wheat acres over the past several decades is apparent. This decline has been mirrored by an even larger decline in hay acreage, with approximately 2.8 M hay acres harvested in 1950 down to approximately 0.5 M acres in 2020. Harvested acres of oats for grain declined starkly in the 1950s and 1960s, from about 3.8 M acres to less than 1 M acres. Acreage continued to decline, although slower, with harvested acres falling below 100,000 in 1993 and reported acreage in recent years ranging from 10,000 – 15,000. Oats are used more widely as a companion crop for forage establishment or often as a cover crop that will winterkill, particularly in the state's northern and central regions.



Fig 5.1. Harvested acres of five main crops in Illinois, 1950-2020. Data from the USDA National Agricultural Statistics Service.



2021 chapter by Alberti et al.

# Sustainable Land Management

## Approval Requested

1) Move forward with composting for animal manure

2) Proceed with cropping system diversification

3) Hire Post-Doc for Agronomy Handbook chapter

# Waste Reduction Strategies

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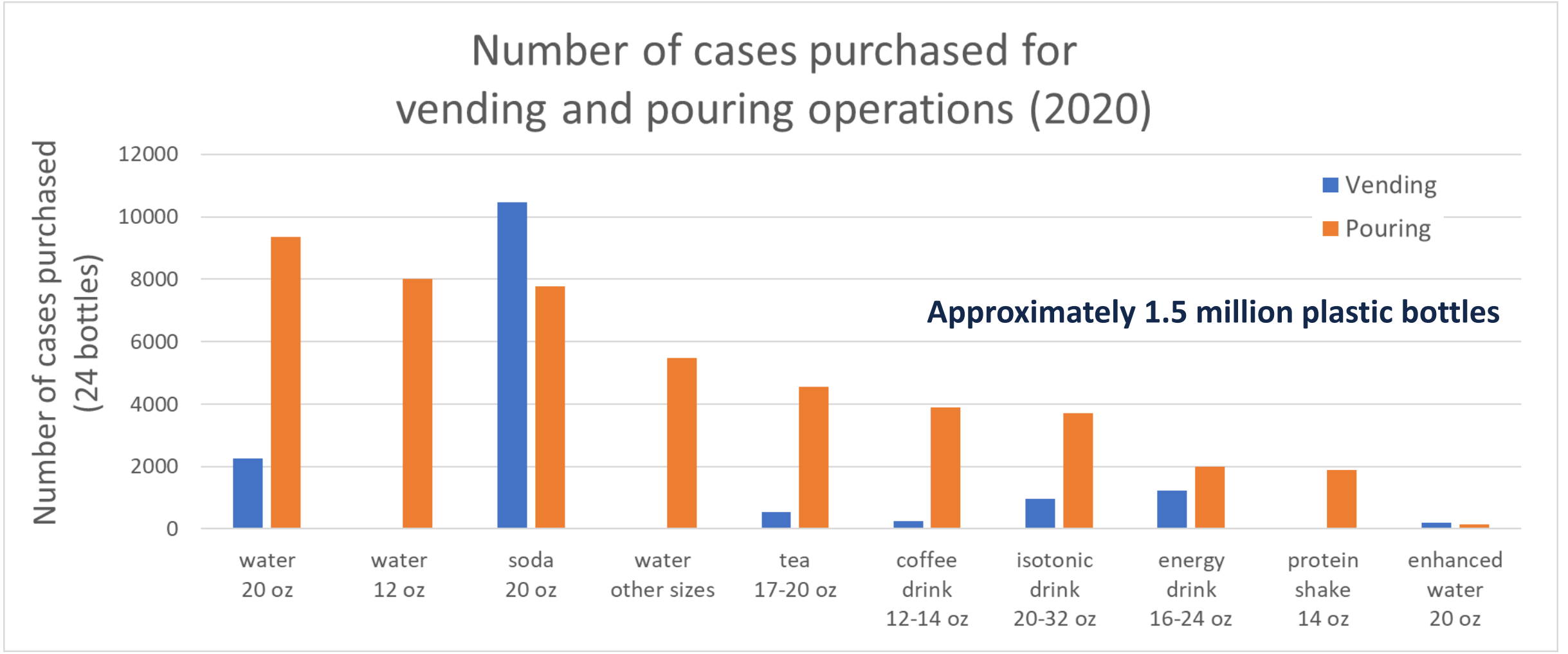
# Waste Reduction Strategies

**Dr. Jennifer Fraterrigo**

***Associate Director for Campus Sustainability***

Institute for Sustainability, Energy, and Environment

# High Demand for Beverages Delivered in Plastic Bottles



# Recycling plastic is not enough

- FY21, 40 tons of plastic waste (#1 and #2) were collected at the University Waste Transfer Station
- China's SWORD program reduced importation of recycled plastics; plastics are piling up at recycling facilities and in many cases being sent to landfills
- Plastics can only be recycled 2-3 times, and each time plastic is recycled, additional virgin material is added. In contrast, glass and aluminum can be recycled infinitely.

# Existing Recommendations about Plastic Waste Reduction - Drinking Water

- Water Drinking Behavior Survey
  - Campus-wide survey to gain a better understanding of drinking water behavior on campus
  - Successful at other universities seeking to reduce plastics (Allegheny & Augsburg College)

- Water Filter System Tracking
  - Determine number, location, and status of all EZH20 bottle filling stations on campus
  - Supported by National Wildlife Federation's Campus Race to Zero Waste

# Waste Reduction Strategies

## 1) Revise Coke Contract
## → use aluminum cans in vending machines

- *Timeline:* Coca-Cola Contract up for renewal in 2025
- *Challenges:*
  - **Coca-Cola regional bottler capacity**: In the past, the regional bottler (East St. Louis) did not have the capability to acquire cans, as they were only producing plastic bottles
  - **Cost concerns**: Aluminum cans can be more expensive, which would raise the price of vending machine products and potentially drive down sales
  - **Logistical consumer concerns**: Open cans are generally consumed in one sitting—not easy to transport in backpack, etc.; Silicon lids could be distributed with UIUC Branding

# Waste Reduction Strategies

## Revise Coke Contract

### → use aluminum cans in vending machines

- *Pros:*
  - Coke is eager to engage in discussions; has worked with other schools
  - Coke is interested in sustainability initiatives: 35% recycled plastic -> 50% by 2030
  - Aluminum generates more profit than plastic for Waste Management at F&S
    - Avg price/bale aluminum: $100
    - Avg price/bale plastic: $20
  - Money acquired through recycling could be used to improve waste and recycling infrastructure. The existing recycling baler is from the 1980s.
  - In 2018 the US recycling rate was 49.8% for aluminum cans  vs. 29% for plastic bottles
- *Costs*:
  - 16oz. can = $1.19 vs. 20 oz. plastic bottle = $1.99
  - Raw material cost for a can is about 25-30% higher than a PET bottle of a similar volume
  - University currently receives 40% commission on plastic bottles and 25% on aluminum cans

# Waste Reduction Strategies

## 2) Increase Use of Local Drinking Water

- → Install more bottle filling stations, near vending machines if possible
- → Educate campus community on the high quality of local drinking water and life cycle of a plastic bottle

# Waste Reduction Strategies

## 3) Switch to compostable materials

→ Switching plastic-ware to compostable items would reduce plastic use, but we currently landfill compostable items

→ Support composting for potential integration of compostable cups, plates, and utensils

## 4) Prioritize an Organic Waste solution

→ Evaluate an anaerobic digester installation on campus

# Waste Reduction Strategies

## Approval Requested

1) Revise Coke Contract
2) Increase Use of Local Drinking Water
3) Switch to compostable materials
4) Prioritize an Organic Waste solution

# Updates

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# Updates

- Campus Landscape Master Plan
- Sustainability in Gen Ed requirements

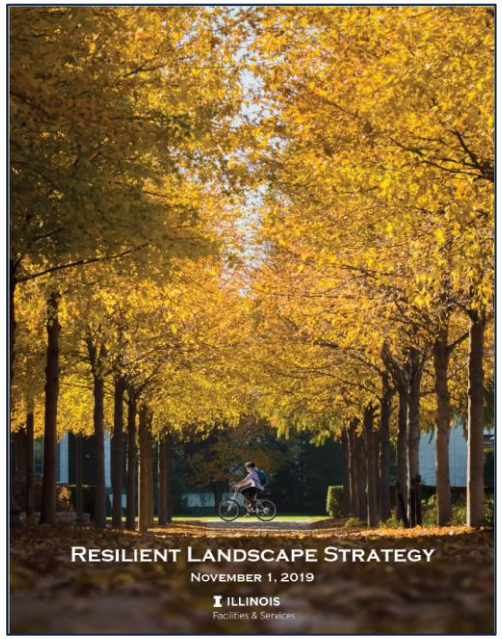
# Campus Landscape Master Plan


**Brent Lewis**

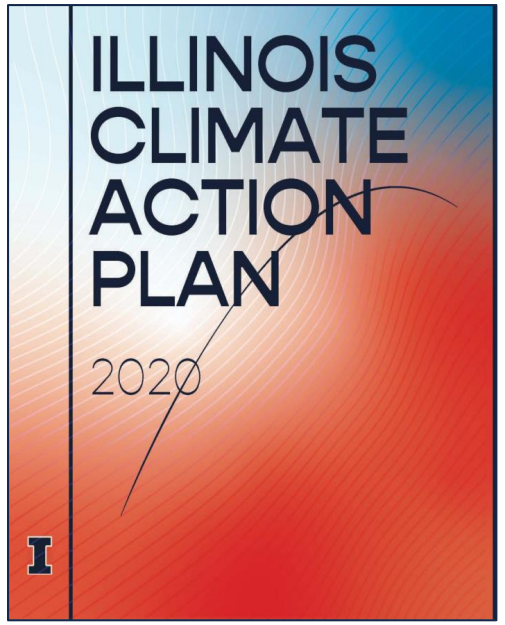
***University Landscape Architect***

Facilities & Services, Capital Programs

# Campus Landscape Master Plan





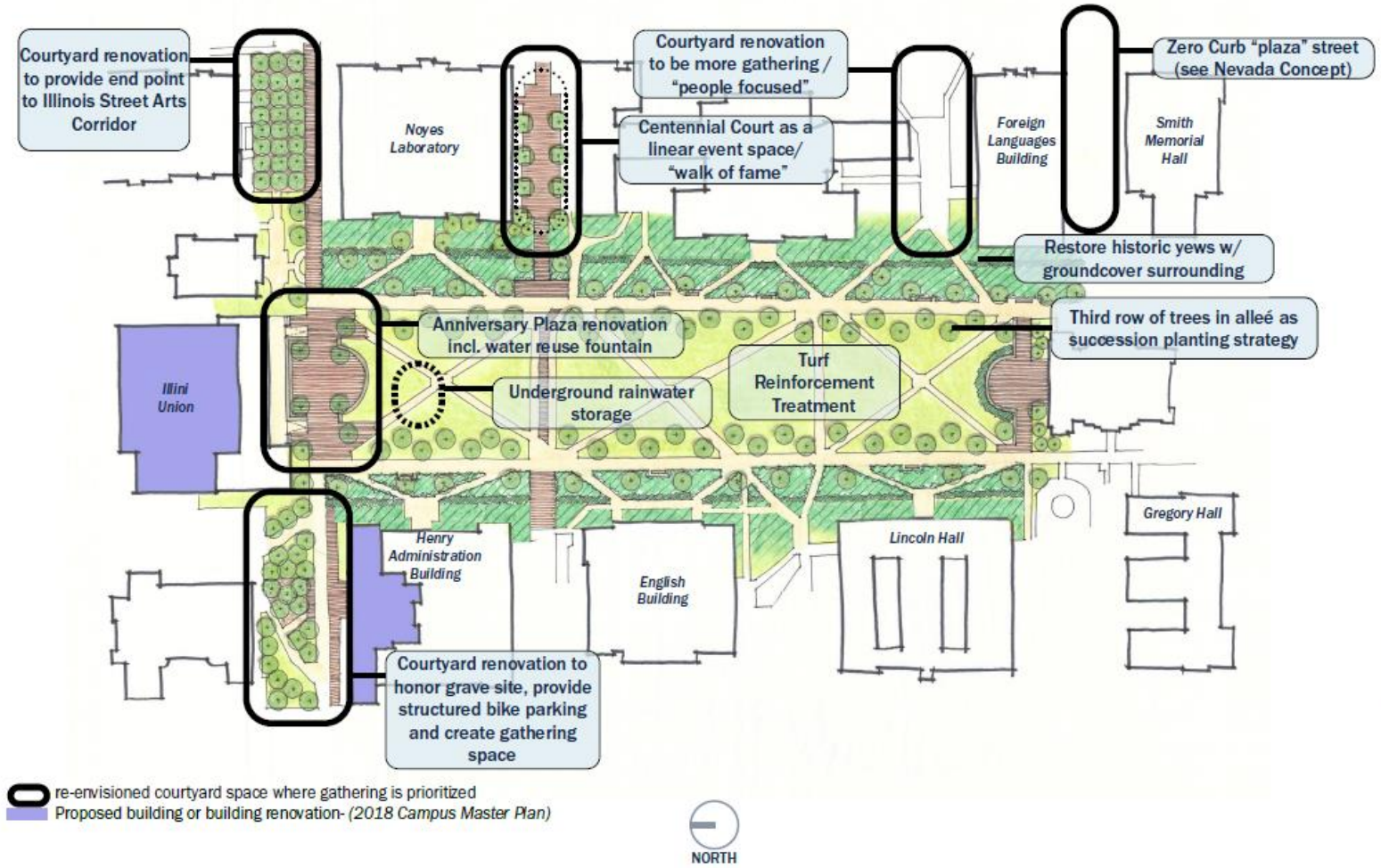


## Stakeholder Input Common Themes

1. The landscape strongly contributes to the economic success of the university.
2. Address areas of deferred maintenance first.
3. More even/equitable investment in landscape across campus.
4. Higher priority set on landscape performance and aesthetics.
5. Intentional funding strategy is needed.
6. Campus should be a world leader in resiliency and stormwater management.
7. Need more maintenance staff across campus, including special skill-sets.
8. Places for people to gather, sit and study is the #1 “missing element” on campus.
9. Current and prospective students want a campus that places sustainability at the forefront by making it visible.
10. Landscape is integral to the mental health of the entire campus community.

# Campus Landscape Master Plan

## MAIN QUAD




### PROJECT SUMMARY

- Strengthen courtyard spaces to meet demands of stakeholders
- "Event proof" turf
- Recreate Centennial Court as a linear event space - Provide underground rainwater storage and "celebrate" it
- Upgrade Anniversary Plaza to better support student activities
- Reinvision courtyards to better support gathering
- Plan for tree succession

# Sustainability Gen Ed. Requirement

**Jessica Nicholson**

***Undergraduate student***

# Sustainability Gen Ed. Requirement

## Purpose and Details

**Proposal: Create a 3 credit-hour gen-ed category within Natural Sciences and Technology for a course in sustainability and environmental topics**

- Will be an option for all undergraduate students to fulfill their Natural Science and Technology credit hours
- Initially passed as an Illinois Student Government resolution
- We must pass it through the UC Senate as a proposal for implementation
- Sponsors and Contributors
  - Author: Jessica Nicholson
  - Senate Sponsors: Senator Alexandra Gergova, Senator Jack Reicherts, Senator Alexandra Nevarez, Senator Bryce Davis, Senator Greg Davidson, ISG Vice President Nicole Arnold
  - Contributors: Sustainability Gen-Ed Working Group, iSEE, iCAP Education and Engagement SWATeams, Gen-Ed Board Working Group, ISG Environmental Sustainability Committee

# Courses to Fulfill Requirement

**List of University-offered courses that focus on sustainability and environment**

- Majority are 3-4 credit hours and undergraduate
- All are relevant to Natural Sciences and Technology, but focus on sustainability
- Initial set of courses proposed for consideration to fulfill this requirement:

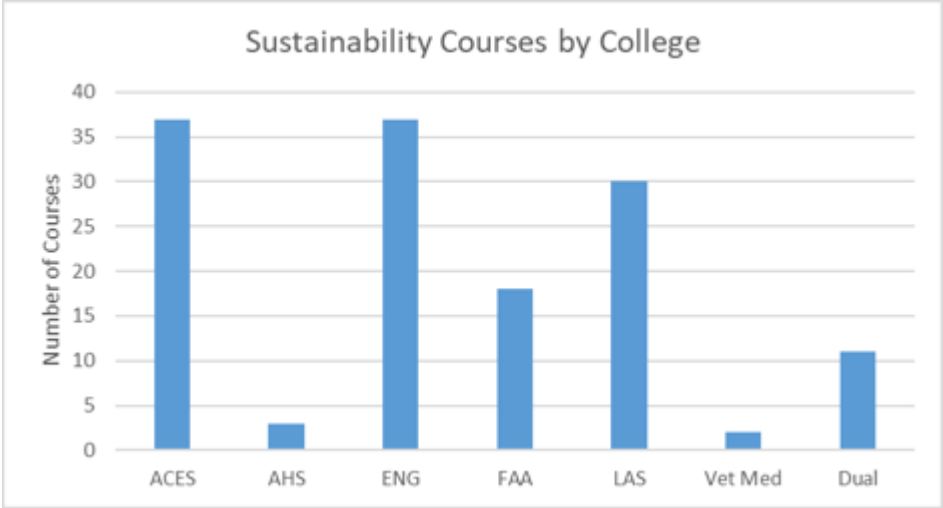
https://docs.google.com/spreadsheets/d/1xO82s4qHGxNaXpj5urH96iQlWGevW0t3/edit?usp=sharing&ouid=101372498739058214439&rtpof=true&sd=true

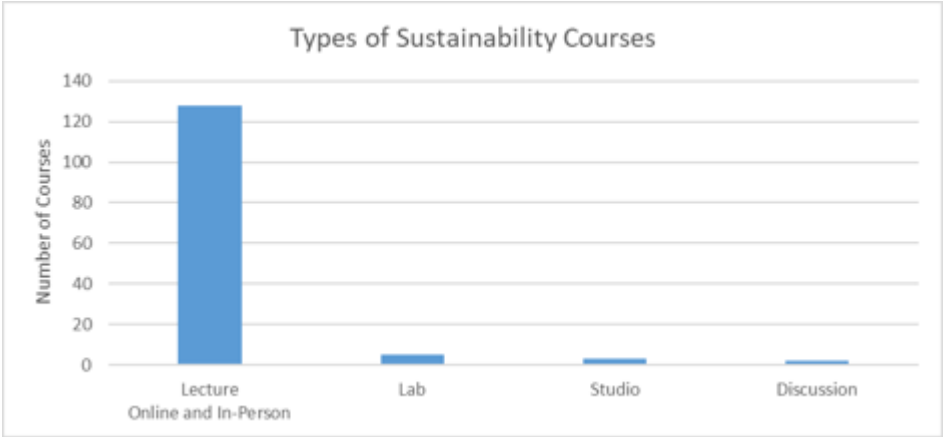
- Course Explorer will list recommended courses starting with this designated course list that are deemed appropriate to fulfill the Sustainability Gen-Ed category
- The General Education Board will work to approve courses to fulfill this requirement
  - Courses we have identified in our list
  - Additional existing courses submitted for consideration
  - Any new courses created by faculty that meet our criteria

# Sustainability Gen Ed. Requirement

## Course Capacity and Projected Demand

- Sustainability-focused courses at UIUC, shortened list used
- Initial set of courses that will be added to upon review by the Gen-Ed Board
- Faculty are encouraged to propose courses
- Distribution of these courses amongst Colleges
- Most courses are lecture-based, ideal for Gen-Ed



# Sustainability Gen Ed. Requirement

## Next Steps

- Written proposal nearly finished, endorsements gathered
- Pass proposal through UC Senate committees
  - Educational Policy
  - Campus Operations
  - Senate Executive Committee
- Invite supporters and contributors to speak on behalf of proposal during discussion
- Introduce final proposal to Senate floor
- Gen-Ed Board will approve courses to fulfill the requirement

Future of the Proposal:

- This proposal creates a category within Natural Sciences that is an option for students
- Will significantly increase enrollment in sustainability-focused courses and build a strong course structure focused on sustainability education
- Is a step towards a stand-alone sustainability general education requirement

# STARS → Shifting to Platinum

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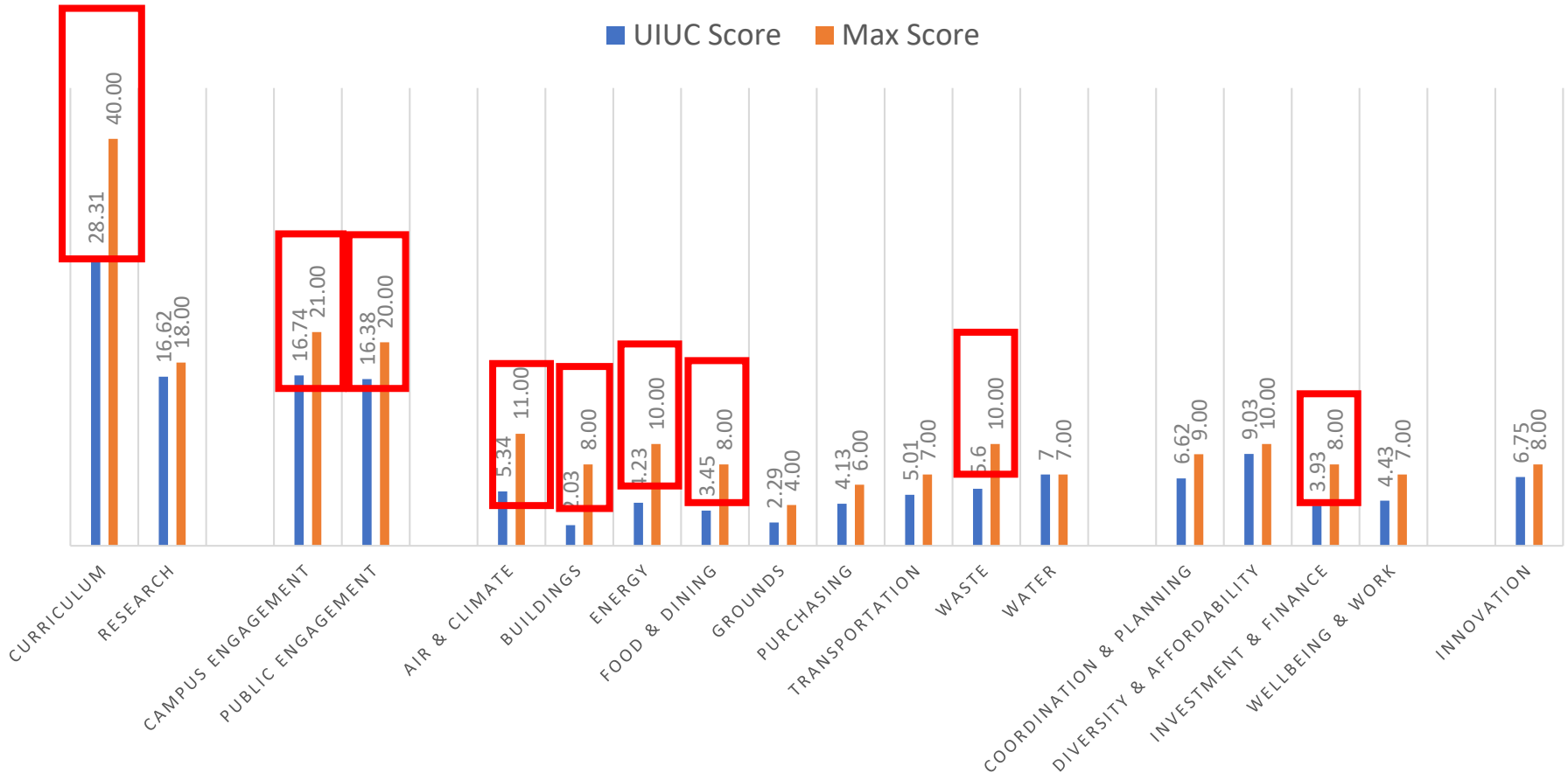
# STARS → Shifting to Platinum


**Meredith Moore**

***Sustainable Programs Manager***

***Institute for Sustainability, Energy, and Environment***

# STARS → Shifting to Platinum




***Preliminary score (72); Platinum status (85)***

- ***What should we work on to improve our score?***
- Curriculum
  - Increase # of sustainability courses
- Campus/public engagement
  - Peer-to-peer engagement, improve tracking mechanisms
- Air & climate
  - Decrease overall GHG emissions
- Buildings
  - LEED O+M
- Energy
  - Building energy efficiency/percentage of energy consumption from clean sources
- Food & dining
  - Increase % of purchases on sustainable/ethically produced products
- Waste
  - Decrease landfill %, increase recycling %
- Investment and finance
  - Increase % of sustainability investments

# Thank you

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