



Meeting Summary  
March 28, 2024

**Council Members Present: (via Zoom):**

Carlo Colella – Vice President for Administration (Chair)  
Scott Lupin – Assoc Dir., Environmental Safety, Sustainability & Risk; Director, Office of Sustainability  
Bryan Quinn – Director of Technical Operation, Department of Electrical & Computer Engineering  
Eric Wachsman – Director, MD Energy Innovation Institute; Professor, Materials Science & Engineering  
Maureen Kotlas – Executive Director, Environmental Safety, Sustainability & Risk  
Tom McMullen – Special Assistant to the Provost for Facilities  
Colleen Wright-Riva – Assistant Vice President, Division of Student Affairs  
Mark Addy – Executive Director, Systems and Networking, Division of Information Technology  
Giovanni Baiocchi- Associate Professor, Geographical Sciences  
Susan Corry – Director, Engineering & Energy  
Jennifer Hadden – Associate Professor, Government & Politics  
Margaret Mothershed – Undergraduate Student Representative

**Guests Present:**

Javiera King – Administrative Coordinator, Office of the Vice President & Chief Administrative Officer

Meeting Highlights

**Draft Climate Action Plan 3.0 Overview - Sally DeLeon & Scot Lupin, Office of Sustainability**

Scott Lupin, Director of the Office Sustainability introduced Sally DeLeon, the office's Sustainability Manager and introduced the Climate Action Plan 3.0 (CAP) as one of the topics for the meeting. He provided a brief history and context for the Climate Action Plan 3.0 (Appendix A) noting that the first climate action plan was initiated in 2009, with periodic updates since then. He highlighted that there are energy projects that are still in the procurement process and that they are awaiting finalization of state regulations, all of which affect the finalization of CAP strategies.

Sally outlined the carbon neutrality goal set for 2050, accelerated to 2025 by President Pines, who also announced a fully electric vehicle fleet by 2035. She stressed the need to review and update the CAP every 5 years and the GHG emissions inventory annually. CAP 3.0 represents the third major update addressing emissions, with the last update in 2017. Mention was made of past commitments set by President Lo in 2014, now transitioning to President Pines' targets. Sally emphasized the legislative timeline, including the Climate Solutions Now Act of 2022 and subsequent milestones leading to statewide net zero emissions by 2045.

CAP 3.0 focuses on maintaining existing strategies and introducing a few new programs to reflect evolving markets, funding, goals, and technologies. Sally proposed future updates as new developments occur,

including presidential commitments and legislative reports. Legislative mandates and partnerships were highlighted, alongside planned CAP 3.0 categories and central strategies (Appendix A).

A committee member inquired about the scope of carbon neutrality, specifically regarding off-campus servers. Sally clarified that such emissions fall under scope 3, suggesting potential exploratory research. They further discussed cloud migration's impact on emissions, prompting Sally to acknowledge the need for additional sections in future CAP updates. Sally also outlined factors influencing future updates, including ongoing studies, regulatory finalizations, infrastructure developments, and technological advancements.

In conclusion Sally mentioned future action items that included, obtaining approval for the Sustainability Council on the latest version of the CAP, creating a communications and outreach strategy for the CAP, and needing support and advocacy for CAP 3.0 when it is unveiled in the fall.

### **Sustainability Fund Proposals Presentation – M. Mothershed**

Margaret Mothershed presented to the Council on the Sustainability Fund Budget and proposals (Appendix B). The Sustainability Fund Review Committee estimates having a revenue of \$650,000 and recommends funding for three proposals:

- *University Libraries Graduate Assistantship Proposal: (\$36,878.00)*
  - Submitted by: Gary W. White, Sr. Associate Dean, Research and Academic Services.
  - The libraries are seeking funding to support a graduate assistant who would conduct a sustainability audit and develop strategies to make the libraries more sustainable with a flexible amount of undergraduates assisting.
  - The Council **unanimously approved** this project proposal.
- *IoT - enabled Hyperlocal Stormwater Living Laboratory at UMD: (\$69,962.00)*
  - Submitted by: Marcus D. Hendricks, Associate Professor.
  - This project would allow for improved stormwater management, climate resilience and weather reporting through the installation of monitors and sensors around campus.
  - The Council **unanimously approved** this project proposal. As long as the project lead is in support of receiving less than the amount they originally requested as the SFRC recommends.
  - The council also had questions regarding the long term maintenance of the project. The project has existed on a smaller scale for years and has been maintained by the staff and faculty involved.
- *Maryland Agrivoltaic Demonstration for Research, Education, and Outreach: (\$100,000.00)*
  - Submitted by: Drew F. Schiavone, Energy Conservation and Technology Specialist for the University of Maryland Extension.
  - AGNR faculty want to develop agrivoltaic systems at two extension centers to reduce energy costs and support renewable energy research. The systems would research the optimal arrangement to maximize energy production and crop yield on the same plot of land.
  - The Council were all in support of this project and it's potential payback. They were interested in the data that will be collected and the effect the panels will have on the utility budget.
  - The Council **unanimously approved** this project proposal with the contingency that the project receive other grant funding from AGNR and the MEA.
- *IBBR Riparian Habitat Restoration: (\$24,940.00)*
  - Submitted by: Stephen Reid, Assistant Director, IBBR Facilities & Lab Services.
  - This project will rehabilitate a stormwater retention pond on the Institute for Bioscience and Biotechnology Research campus in Rockville. The drainage pond encounters many

issues like impervious surfaces and regular algae blooms. This project will reduce nutrient inputs into the watershed and support biodiversity.

### **Open Forum**

*Adjourn 12:30PM*

### **Appendices:**

*Appendix A: Draft Climate Action Plan 3.0 Overview - Sally DeLeon & Scott Lupin, Office of Sustainability*

*Appendix B: Sustainability Fund Proposals Presentation*

DRAFT

# Climate Action Plan 3.0

*Briefing to the University Sustainability Council*  
*March 28, 2024*



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# Refresh Needed

Update is necessary to satisfy guidelines for the Presidents' Carbon Commitment

**FEARLESSLY  
FORWARD**

CAP 2.0 finish  
line reached  
in 2022

#fearlessideas



# Leadership on Climate Change

**2007 > 2014 > 2021**

Every seven years UMD's president has launched a voluntary operational climate action initiative

Each initiative has showed UMD's **deepening ambition**



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FORWARD**



**2030**

# CLIMATE ACTION TIMELINE

2007	2009	2014	2018	2021	2022
Climate Leadership Commitment	Climate Action Plan 1.0 (2.0 in 2017)	President Loh's Energy Initiatives	Meet 50% Reduction in Net GHG Emissions	President Pines 2025 Carbon Neutrality Commitment	Maryland's Climate Solutions Now Act of 2022
2025	2025	2031	2035	2040	2045
Maryland's Building Energy Performance Standards	Campus Net Carbon Neutrality Commitment	60% Reduction in Statewide Emissions Target, 20% EUI Reduction by BEPS	Fossil-Fuel Free Power Plant & Zero-Emissions Vehicle Fleet Target	BEPS Net-Zero GHG Emissions Target	Statewide Net-Zero Emissions Target



## TIMELINE



# New Regulatory Requirements

CAP 3.0 will be refreshed regularly to 3.1, 3.2, 3.3 etc. as campus departments adopt new strategies, projects and resources to meet the State's new regulatory milestones





# Refresh - CAP 3.0

Stakeholders worked with OS to prepare and quantify existing strategies and set the foundation for our next phase of climate action



# KEY MILESTONES: PRESIDENTIAL COMMITMENTS

## Carbon Neutrality (“Net-Zero Carbon Emissions”): 2025

- ▶ Established by President Pines in his 2021 inaugural address
- ▶ Accelerates previous CAP commitment by 25 years
- ▶ Progress towards this strategy is underway with the strategic purchased carbon offsets to meet at minimum carbon neutrality on Earth Day 2025 (April 22, 2025)

## Zero-Emissions Vehicle Fleet: 2035

- ▶ Established by President Pines in his 2021 inaugural address
- ▶ In line with State of Maryland Zero Emissions Vehicle (ZEV) state-owned vehicle procurement requirements
- ▶ Progress towards this target is underway with the ZEV Infrastructure Study, Severn ZEV pilot and ShuttleUM bus electrification grant

## Fossil-Fuel Free Power Plant: 2035

- ▶ Established by President Pines in the Fall 2022 Welcome Message: Where Change Begins
- ▶ The Maryland Building Energy Performance Standards (BEPS) may influence the outcomes of this program
- ▶ Progress towards this target is currently tied to the NextGen Energy Program



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# INFLUENTIAL STATE LEGISLATION & REPORTS

- ▶ SB528: Climate Solutions Now Act of 2022
  - ▶ 60% statewide GHG reduction from 2006 levels by 2031,
  - ▶ Net-zero emissions by 2045 ([Maryland's Climate Pollution Reduction Plan](#))
  - ▶ Maryland Building Energy Performance Standards: 20% reduction in net direct greenhouse gas (GHG) emissions by January 1, 2030, as compared with 2025 levels for average buildings of similar construction and net-zero direct GHG emissions by January 1, 2040.
- ▶ HB1391: Clean Cars Act of 2022
- ▶ SB781 / HB793: Promoting Offshore Wind Energy Resources (POWER) Act (2023)
  - ▶ 8.5 gigawatts (GW) of offshore wind energy by 2030
  - ▶ Maryland Public Service Commission: "[Assessment of Electrification Impacts on the Maryland Electric Grid](#)"
- ▶ SB483 / HB264: Solid Waste Management – Organics Recycling and Waste Diversion – Food Residuals (2023)
- ▶ Maryland Green Building Requirements: High Performance Green Building Program (March 2022)





## CLIMATE ACTION PLAN 3.0 CATEGORIES

- ▶ Power
- ▶ Power: Heating and Cooling (*NextGen*)
- ▶ Refrigerants & Chemicals
- ▶ Campus Fleet
- ▶ Land Use and Management
- ▶ Solid Waste
- ▶ Air Travel
- ▶ Commuting
- ▶ Purchasing
- ▶ Education & Research



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FORWARD**



# CENTRAL STRATEGIES

## Maintain Existing Climate Action Strategies

- ▶ 100% Renewable Purchased Power; Renewable Energy Projects
- ▶ Governor's Energy Conservation Executive Order; Identify Steps to Support and Improve Energy Efficiency
- ▶ Divert & Recycle Appropriate Solid Waste & Compost Appropriate Organic Solid Waste
- ▶ Reduce Single Occupancy Vehicle Commutes; Micro-mobility Support; Safety for Campus Bicyclists

## Power Plant & Electrification Infrastructure

- ▶ President's Zero Emissions Vehicle Initiative; ZEV Infrastructure Study; Shuttle UM Electrification
- ▶ Campuswide Decarbonization Study and Plan development
- ▶ Central Energy Plant Improvements ([nextgen.umd.edu](https://nextgen.umd.edu))

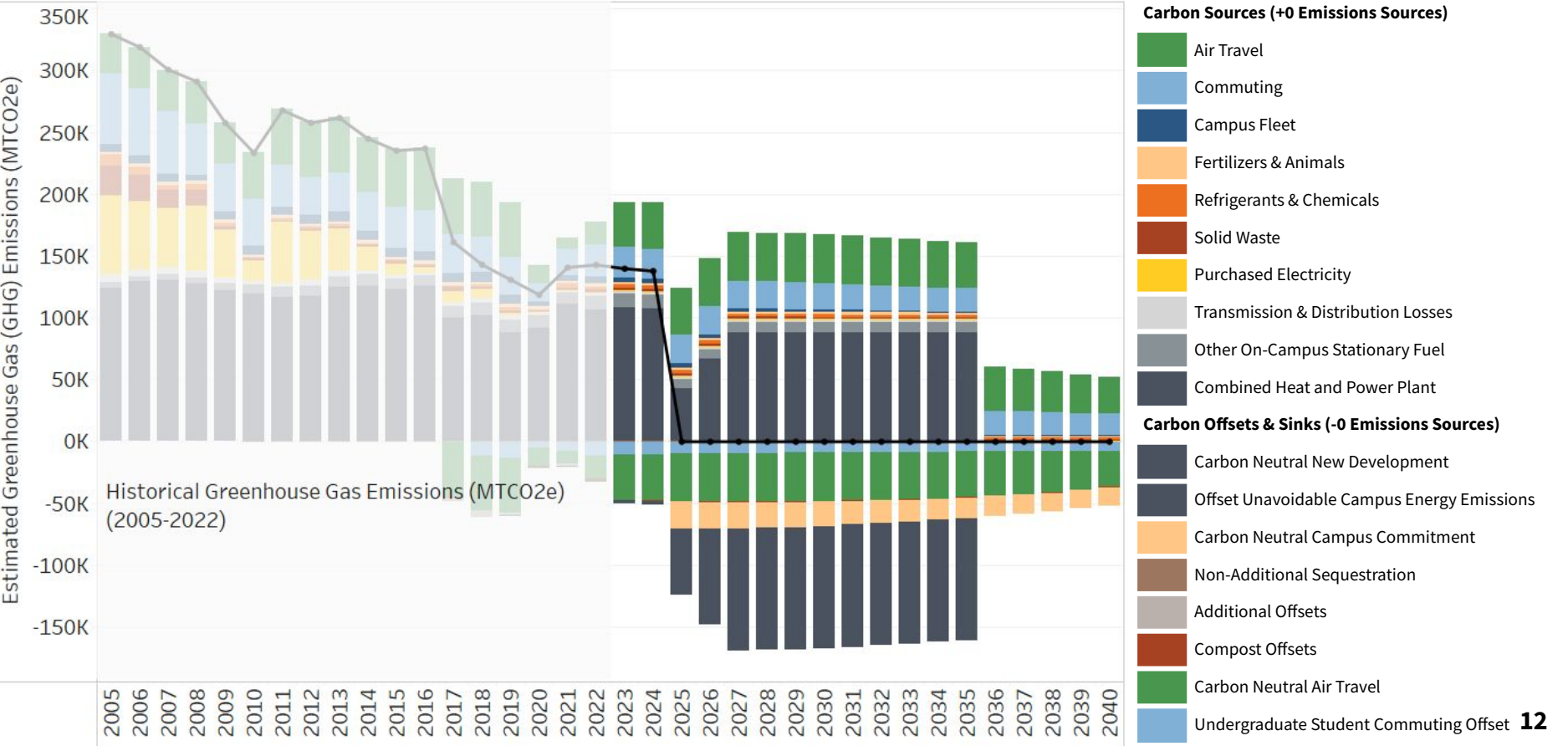
## Carbon Offsets for unavoidable emissions during decarbonization:

- ▶ Carbon Neutral Air Travel and Undergraduate commuting since 2017/2018
- ▶ Net Zero Carbon Neutral Campus starting in 2025



# Climate Action Plan 3.0: Projected Greenhouse Gas Emissions (2023-2040)

Metric Tons of Carbon Dioxide Equivalent (MTCO2e), University of Maryland, College Park





## **CAP 3.0 OPPORTUNITY:** **Campuswide Decarbonization Study**

### **Emissions Sources Not Fully Addressed by CAP 3.0**

- ▶ Building-level Energy Use
- ▶ Satellite Campus Energy Use: IBBR, MAES, MFRI
- ▶ Fertilizers, Animals, & Land Use
- ▶ Refrigerants, Chemicals, & Research Materials

### **Benefits & Outcomes of a Decarbonization Plan**

- ▶ Will establish new emissions reduction strategies from 2026-2040
- ▶ Pathway with interim targets and goals
- ▶ Explore adding climate restorative practices



# Future Factors

Emerging issues that will influence  
the next CAP update

- Final design for Central Energy Plant improvements
- Decarbonization study findings
- Finalization of the State Building Energy Performance Standards
- Completion of the Purple Line
- Expansion of cyclist and pedestrian infrastructure
- EV and ZEV market availability
- Emerging technologies
- Climate Leadership Network
- Availability of funding



# Emerging Network Initiatives



 Second Nature



## Commitments 3.0 Workgroup

- ▶ Incorporate framing in [climate justice principles](#)
- ▶ Update technical guidance to reflect the urgency of the climate crisis
- ▶ Consider various membership models for the Leadership Network

## Carbon Offsets Advisory Council

- ▶ Following emerging standards, codes and tools
- ▶ Collaborative discussion about how to best lead and behave to maximize positive outcomes
- ▶ Finding: Schools that have claimed carbon neutrality in network have offset 82% of direct emissions on average





**GRANT RECOMMENDATIONS March 2024**



# Sustainability Fund Budget for FY24



FY24 General Info		Expenses	
Fund Balance as of July 1st	\$284,410	Sustainability Mini-Grants**	\$20,000
FY24 Revenue	\$683,668.84	Carbon Offsets for Carbon Neutral Undergrad Commuting**	\$100,000
<b>Proposals Received</b>	21	Grants Issued to-date	\$372,939.67
FY24 Total requested	\$1,657,001.59	Today's Grant Recommendations	\$231,779
FY24 Requests still pending	\$243,359.67	Remaining Balance if recommendations are approved	\$243,359.67

\*\*Maximum allowed



## Projects Recommended for Funding



1. University Libraries Graduate Assistantship Proposal
2. Stormwater Living Laboratory
3. Maryland Agrivoltaic Demonstration for Research, Education,  
and Outreach
4. IBBR Riparian Habitat





## Graduate Assistantship Proposal



**Requested:** \$36,878

**SFRC recommendation:** \$36,878

**Summary:** The libraries are seeking funding to support a graduate assistant who would conduct a sustainability audit and develop strategies to make the libraries more sustainable with a flexible amount of undergraduates assisting.



**Submitted by:** Gary White, Senior Associate Dean, Research and Academic Services



# Graduate Assistantship Proposal



- The number of undergraduates is flexible depending on their departmental funding, they anticipate hiring 2-4 undergraduates to assist the GA
  - Seeking funding from us for one
- GA duties will include:
  - Conducting a sustainability audit of campus library spaces and practices
  - Deepen sustainability connections between the library and related groups
  - Develop immediate, short and long term strategies to improve sustainability in all library spaces
- They may also assist in ongoing efforts, such as:
  - Composting/adhering to guidelines
  - Assisting sustainability workshops
  - Food/clothing drives





## Stormwater Living Laboratory



**Requested:** \$124,155

**SFRC recommendation:** \$69,961

**Summary:** This project would allow for improved stormwater management, climate resilience and weather reporting through the installation of monitors and sensors around campus.

**Submitted by:** Marccus D. Hendricks, Associate Professor of Urban Studies and Planning





# Stormwater Living Laboratory



- Since graduate salaries were such a large part of this proposal, we are recommending funding the equipment and undergraduate salaries
- There are currently three campus priority stormwater drainage outfalls equipped with IoT stormwater sensor sets
  - Research has lead to two manuscripts, presentations at conferences and three project reports
- Installation of further sensors would allow for real time stormwater monitoring across campus
- Expand IoT network and increase student involvement
  - Data integration using GIS
  - Developing a data visualization dashboard



# Stormwater Living Laboratory



2 undergraduate students	\$	17	520	<u>17,680</u>	10 hours/week; 12 months; 2 UG student; field management and quality control work data harmonization and visualization, and UG trainee program design/build
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<i>Other Direct Costs - Equipment</i>	<i>Cost</i>	<i># of units</i>	
IoT sensor box - MACE FloSeries Hydromace	\$ 4,380	3	13,140 Trainee program equipment
Doppler Ultrasonic Area/Velocity sensors	\$ 3,395	3	10,185 Trainee program equipment
Aqua TROLL Multiparameter Sonde (water quality) sensors	\$ 6,760	3	20,280 Trainee program equipment
WebComm - 4G sim Cards	\$ 595	3	1,785 Trainee program equipment
Miscellaneous (installation assistance)	\$ 1,500	1	1,500 Trainee program equipment
Calibration chemicals	\$ 500	1	500 Trainee program equipment
Hydroview pre-paid cellular (one year for each Mace sensor)	\$ 120	3	360 Trainee program equipment
Consultant field visit (amount by 1/4 days)	\$ 200	8	1,600 Trainee program equipment and equipment consultant
IoT visualization software subscription (one year)	\$ 1,800	1	1,800 Software for objective #2 and #4
<b>Total Other</b>			<b><u>51,150</u></b>



## Agrivoltaic Demonstration for Research, Education, and Outreach



**Requested:** \$100,000

**SFRC recommendation:** \$100,000

**Summary:** AGNR faculty want to develop agrivoltaic systems at two extension centers to reduce energy costs and support renewable energy research. The systems would research the optimal arrangement to maximize energy production and crop yield on the same plot of land.

**Submitted by:** Drew Sciavone, Extension Specialist





## Agrivoltaic Demonstration for Research, Education, and Outreach



- Seeking funding for small equipment, undergraduate, and graduate assistant salaries
- Project would research best practices for agrivoltaic systems and how to optimize energy production and crop yield
- UMD would save about \$44,662 per year and generate \$2,436 per year in solar renewable energy credits
  - Payback period of 2.12 years
  - Lifespan of 25-30+ years
- Students would assist with data collection, load monitoring, system design and analysis
- Expecting funding from AGNR and MEA to support phase 2
  - They will know by the summer, before the project is set to start
- Recommending that it is fully funded with the condition that they receive funding from AGNR and MEA



# Agrivoltaic Demonstration for Research, Education, and Outreach



Personnel			
Undergrad. Assistance	Data collection, load monitoring, and analysis in Year 1	Sustainability Fund	\$20,000
Graduate Assistance	System design, placement, layout, and analysis in Year 1 and 2	Sustainability Fund	\$60,000
Research Technician	Project coordination, development, and implementation	Maryland Energy Admin	\$30,000
<b>Subtotal</b>			<b>\$110,000</b>
Contracts and services			
System engineering	Modeling, (pre-)design, commissioning, and utility engineering study	Maryland Energy Admin	\$30,000
General contractor	Installation of solar systems	Maryland Energy Admin	\$45,000
<b>Subtotal</b>			<b>\$70,000</b>
Equipment, tools, supplies			
Energy meters	Sensors and instrumentation to monitor energy use at UMD facilities	Sustainability Fund	\$10,000
Solar software	System design, placement, layout, and analysis	Sustainability Fund	\$10,000
<b>Subtotal</b>			<b>\$20,000</b>
Capital Expenditures			
PV infrastructure	Solar panels, racking and balance of system at each location (~150kW)	Maryland Energy Admin	\$400,000
Agrivoltaic system	Supplementary field and PV infrastructure at each location	AGNR	\$100,000
<b>Subtotal</b>			<b>\$500,000</b>
<b>TOTAL</b>			<b>\$700,000</b>



# IBBR Riparian Habitat



**Requested:** \$34,940

**SFRC recommendation:** \$24,940

**Summary:** This project will rehabilitate a stormwater retention pond on the Institute for Bioscience and Biotechnology Research campus in Rockville. The drainage pond encounters many issues like impervious surfaces and regular algae blooms. This project will reduce nutrient inputs into the watershed and support biodiversity.

**Submitted by:** Stephen Reid, Assistant Director for Facilities and Lab Services





# IBBR Riparian Habitat



- Challenges currently:
  - 39% impervious drainage area
  - Large algae blooms in the summer
  - Significant nutrient runoff
  - Lack of a riparian buffer
- Restoration of the riparian habitat surrounding the pond would limit goose access, filter runoff, increase biodiversity, and improve the physical appearance of the pond
- In discussions with Stephen Reid, he agreed to allocate \$10,000 out of his departmental funds for the project
- FM will be responsible for all landscaping and maintenance of the pond after the project is complete.