



PRESIDENT'S SUSTAINABILITY RESEARCH FELLOWSHIP

ANNUAL REPORT 2023-2024

PRESIDENT'S OFFICE

ENVIRONMENTAL STUDIES

OFFICE OF SUSTAINABILITY

LANG CENTER FOR CIVIC & SOCIAL RESPONSIBILITY

SWARTHMORE

LETTER FROM THE CO-PRESIDENTS

Dear Friends,

The President's Sustainability Research Fellowship (PSRF) represents the liberal arts at work. Through this program, students learn project management, collaboration, and effective communication. They also develop an openness of mind that allows them to seek out and learn the unanticipated lessons that life has to teach. This program reminds us all that Swarthmore impacts the world not only through the work that happens here, but also by preparing our students to create new and exciting forms of social change beyond their time on campus.

President's Sustainability Research Fellowship projects model what it means to use rigorous intellectual study that touches on some of the most complex and urgent challenges facing the world today. The projects you'll read about in this annual report break down silos and catalyze change across the College. These fellows have provided us all with a greater awareness that allows us to become stronger advocates for sustainability within our own communities. When our country's recognition of and response to the climate crisis is in doubt, this work is a source of hope, to us personally and to our entire campus.

We thank James Padilloni, visiting assistant professor of religion and environmental studies, and E. Carr Everbach, Isaiah V. Williamson Professor of Civil and Mechanical Engineering and professor environmental studies, who served as faculty leads for the PSRF program during the 2023-24 academic year. Special thanks goes to Ben Berger, executive director, and his team at the Lang Center for Civic & Social Responsibility. We are also deeply grateful to Elizabeth Drake, director of sustainability, and Juliana Lin '22, civic and environmental engagement fellow, for stewarding this program. And thank you to all of the mentors and advisors who have given so generously of their time and expertise to the projects.

We look forward to the ninth year of the President's Sustainability Research Fellowship and welcoming the new cohort of fellows.

With gratitude on behalf of President Val Smith,

Rob Goldberg
Acting Co-President
Vice President for Finance and Administration

Tomoko Sakomura
Acting Co-President
Provost and Dean of the Faculty and Professor of Art History

WHAT IS PSRF?

The President's Sustainability Research Fellowship (PSRF) at Swarthmore College fosters student learning by positioning students to steward vital sustainability challenges. The program matches students with staff and faculty mentors to research, develop, and implement sustainability projects in a yearlong course and associated internship. The innovative PSRF program — a collaboration between the President's Office, the Office of Sustainability, the Environmental Studies Program, and the Lang Center for Civic & Social Responsibility — fosters interdisciplinary participation across the institution. Throughout the year, fellows apply their knowledge to pressing needs, develop vital leadership skills, and produce replicable solutions to pressing sustainability issues on our campus and beyond.



President Smith, fellows, and teaching staff gathered in October 2023 for fellows to pitch their projects

YEAR IN REVIEW

In the program's eighth year, the yearlong course was taught by Visiting Assistant Professor of Religion and Environmental Studies James Padilioni and Isaiah V. Williamson Professor of Civil & Mechanical Engineering and Professor of Environmental Studies E. Carr Everbach, alongside Director of Sustainability Elizabeth Drake. Nine students were selected to participate in the program, taking part in nine separate projects.

With the support of course instructors, a wide array of guest speakers, and other program participants, fellows spent the year learning about topics including change management, environmental justice, and the climate crisis. In their internship, the fellows worked closely with project mentors and board members to design and implement a truly impressive array of projects. Fellows were also each matched with a sustainability sage, an alumnus, for project consultation and mentorship. Many sustainability sages themselves participated in PSRF while at Swarthmore, reflecting the program's enduring legacy.

Through the years, the PSRF program has allowed fellows to help the College make exciting progress on its sustainability goals in areas including food systems, zero waste, and the integration of sustainability into the curriculum. This year, fellows conducted grant research for Swarthmore Borough to obtain electric vehicle chargers, outlined a food recovery program for campus, engaged high school students in planting of the Crum Woods meadow, and so much more.

In May 2024, over 50 people attended PSRF final presentations to learn more about and celebrate the fellows and their incredible work. We invite you to read on for project summaries of the 2023-2024 PSRF cohort.



PSRF's George Fang '25, Clara Lee '26, and Saumya Raj '25 respond to a question from the audience during their May 2024 final presentations.

PSRF TEACHING TEAM 2023-24



Elizabeth Drake

*Director of Sustainability
PSRF Co-instructor*



James Padilioni

*Visiting Assistant Professor,
Religion & Environmental Studies
PSRF Co-instructor (Fall)*



E. Carr Everbach

*Isaiah V. Williamson Professor of
Civil & Mechanical Engineering and
Professor of Environmental Studies
PSRF Co-instructor (Spring)*



Juliana Lin '22

*Civic & Environmental
Engagement Fellow
Teaching Assistant*

ACKNOWLEDGMENTS

CLASS OF 1968 FELLOW

Thank you to the Class of 1968, which endowed the Class of 1968 President's Sustainability Research Fellowship as part of its 50th reunion gift. The fund is intended to provide support for two fellows annually.

This year's Class of 1968 fellows were Jacob Herbold '26 and Saumya Raj '25.



Jacob Herbold '26



Saumya Raj '25

SUSAN LAMB '82 AND RICK SEAVEY FELLOW

Thank you to Susan Lamb '82 and Rick Seavey who established the Susan Lamb '82 and Rick Seavey President's Sustainability Research Fellowship in 2017. The fund is intended to provide support for at least one fellow annually.

This year's Susan Lamb '82 and Rick Seavey Fellow was Clara Lee '26.



Clara Lee '26

To all the alumni and friends of the College who support PSRF each year, and to the students, staff, and faculty who participated in the program this year,

THANK YOU!

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Lindsey Turner '25

SENIOR FELLOW

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Ryan Jin '24



From left to right, back row: George Fang '25, Jacob Herbold '26, Saumya Raj '25, Oviya Kumaran '24, Slate Hyacinthe '24; front row: Lindsey Turner '25, Isabela Ibrahim '25, Clara Lee '26



Anastasia Erley '25, she/her

PROJECT TEAM

Project Mentor:

Chris Kane, director of procurement

Project Board Members:

Elizabeth Drake, director of sustainability; Elizabeth Stern, inventory control coordinator, Facilities Management; Jessica Smalarz, special assistant, Faculty Affairs; Kelly Fitzpatrick, administrative coordinator, Information Technology Services; Patti Braun, senior buyer, Facilities; Alice Turbiville, associate vice president for finance & assistant treasurer

Sustainability Sage:

Chloe Klaus '19

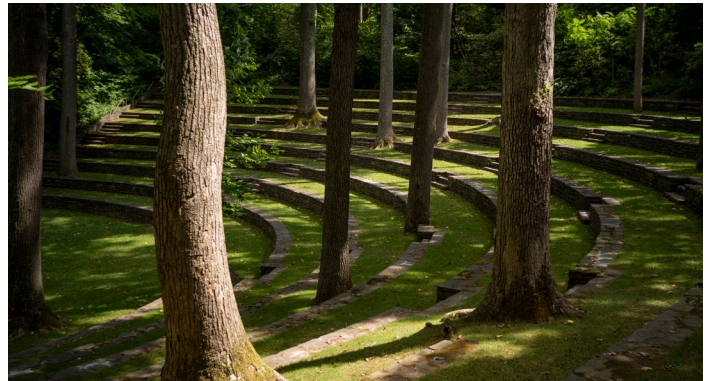
MISSION

In line with the College's goals for [carbon neutrality](#) and [zero waste](#) [PDF] by 2035, this project aimed to establish a comprehensive and centralized procurement strategy for Swarthmore. The focus of the strategy was on interweaving sustainability into the institution's decision-making processes while promoting ethical procurement, diminishing our environmental footprint, and cultivating a culture of sustainability within the campus community.

BACKGROUND

The day-to-day operations of the College depend on a large volume of purchased goods and services, all of which have an environmental impact. Developing a sustainable purchasing policy is an underexplored opportunity for Swarthmore to live into our values and longstanding commitment to sustainability. While some work has been done on sustainable purchasing, the College does not yet have a comprehensive sustainable purchasing program in place. Sustainable procurement is a multifaceted, globally recognized concept that has substantial influence in mitigating the environmental impact of institutional operations and advocating for ethical practices in procurement.

The College has a decentralized purchasing structure, where many individual faculty and staff members are responsible for procuring goods and services for their departments. Some larger institutions instead choose to handle these functions more centrally through a series of protocols, guidelines, and tools applied across the institution. Centralized procurement plays a pivotal role in promoting eco-friendly practices, ethical sourcing, and accountability, all contributing to the institution's broader commitment to environmental responsibility and sustainability.





OUTCOMES

As a first step, Anastasia worked with her mentor to define a framework for sustainable procurement within the context of the College and start developing an integrated approach for procuring goods and services that prioritizes environmental, social, and economic responsibility throughout the entire lifecycle of a product or service. This proposed definition encompasses more than simply choosing “green” alternatives — it incorporates environmental ethics, green score ratings, and the support of local business to transform our procurement practices into a driving force for positive change at our College and beyond.

Anastasia conducted the foundational research necessary to develop a sustainable purchasing policy and networked with other institutions and experts in the field by joining the Sustainable Purchasing Leadership Council (SPLC). The SPLC are leaders in sustainable procurement and offer an abundance of resources and guidance, including a learning hub with climate and procurement fundamentals, the ability to connect with a community of other institutions at similar stages of developing their sustainable procurement, and guidance for sustainable purchasing through e-learning. As a member, the College is able to participate in a program designed to provide coaching on developing sustainable procurement through strategic programming. This includes collecting metrics to better understand our internal stakeholder engagement, overall strategy development, and organizational inventory.



FUTURE WORK AND RECOMMENDATIONS

Equipped with the connections and resources from the SPLC, the next step towards finalizing a sustainable procurement program for the College is to outline a detailed road map to establish formal protocols and policies, develop tailored educational resources for our community members responsible for procurement, and establish a user-friendly platform to facilitate the selection of sustainable options, prioritizing automatic procurement of green products to streamline processes. The project should also work towards expanding the project board to encourage more interdisciplinary collaboration, which will be essential to making sustainability more accessible through centralizing procurement.

SUSTAINABLE PRINTING



George Fang '25, he/they

PROJECT TEAM

Project Mentors:

Mark Davis, director of support services, Information Technology Services; Seth Frisbie-Fulton, manager of endpoint system, Information Technology Services

Project Board Members:

Amanda Atkinson, director of residential communities; Chris Kane, director of procurement; Hannah Ulloa, climate action manager; Patrick Sinko, McCabe Library access & user services supervisor; Kelly Fitzpatrick, administrative coordinator, Information Technology Services

Sustainability Sage:

James Chen '17

MISSION

This project aimed to significantly improve campus printing sustainability by identifying socio-technical solutions to systemic problems in the College's printing system, as well as to support the rollout of a new swipe-release program.

BACKGROUND

Through systems design and behavior change initiatives, this project embodies the College's commitment to achieve [zero waste by 2035](#) [PDF]. This work continues that of PSRF Fellow Chloe Klaus '19, who began Swarthmore's printing overhaul with the [Sustainable Printer Purchasing Policy](#), which standardized printer acquisition and placement for new printers across campus. Swipe-release, a new initiative rolled out by ITS, is a method of printing that requires the swipe of a OneCard at a printer to release the job for printing. This approach has been shown to reduce paper waste from printing.

OUTCOMES

Evaluation of Sustainable Printing Practices

George collected and analyzed data on how several peer institutions approached sustainable printing. The findings were compiled in an extensive spreadsheet that served as the basis for new recommendations about how Swarthmore could continue to reduce waste from campus printing.

Swipe-Release Program

The project supported the research, deployment, and publicity of swipe-release and mobility print, which allows users to quickly print from their phone, tablet, or laptop or using any printer on campus to

SWIPE-RELEASE
PRESENTED BY THE OFFICE OF SUSTAINABILITY & ITS

SO, WHAT'S NEW?

WHY NOW?

01 EASE OF USE
Swipe-release makes it easy to implement more accessible technologies down the road, like printing from your phone or choosing when and where you want to release it after you've already sent the job.

02 SECURITY & PRIVACY
Worried about people seeing what sensitive information you were printing, or worse—taking your print job? Swipe-release ensures the paper doesn't come out until you're at the printer, ready for release.

03 IT'S GOOD FOR THE ENVIRONMENT
Swipe-release reduces erroneous and uncollected print jobs, saving 15% paper on average.

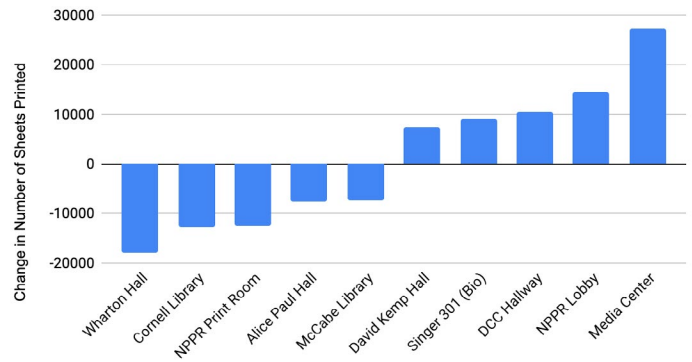
Flier sent to offices and staff on campus explaining the benefits and rationale behind swipe-release

release a print job without having to manually configure printer or network settings. This technology was installed in printers in the College's libraries, with this functionality coming to dorms and departmental printers in the next year. To increase visibility of the program, George created educational signage and published an [article](#) in the student newspaper, *The Phoenix*.

An analysis of printing usage revealed that McCabe and Cornell Libraries had the highest printing volume, at 247,288 sheets (18.3% of total campus printing) printed during the 2022-2023 academic year. This year, after the introduction of the swipe-release function, McCabe and Cornell's total printing volume has decreased by 7.6%. Additionally, by requiring users to release print jobs at the printer, the swipe-release technology prevented an additional 20% of pages from being printed.

Swarthmore Annual Printing Change (2022–23 vs. 2023–24)

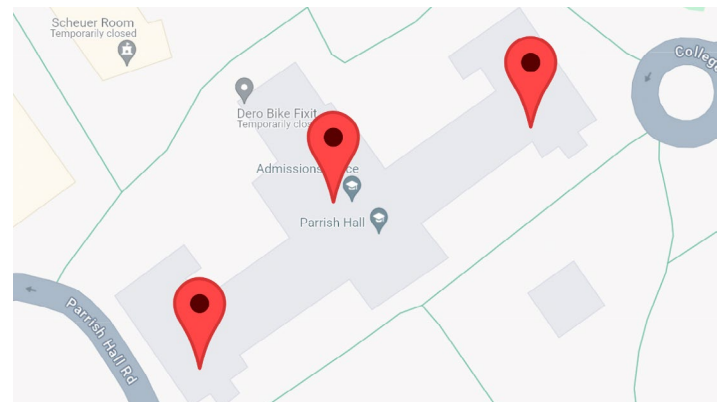
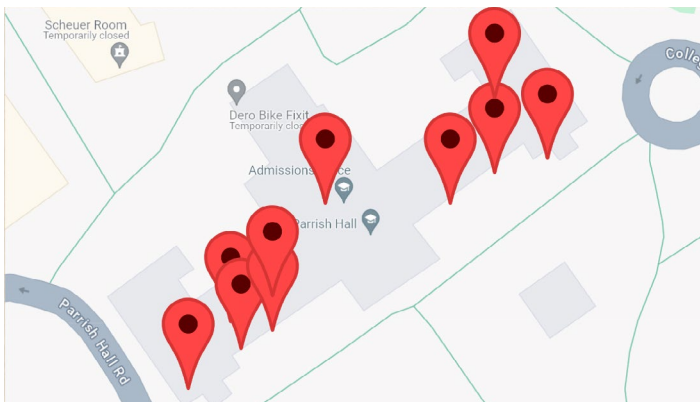
Largest changes in printing from the 2022-23 to 2023-24 academic year.



Graph depicting the largest positive and negative changes in student printing from the 2022-23 to 2023-24 academic year

Parrish Hall Case Study

George also evaluated opportunities to reduce the number of printers on campus by studying available offices in Parrish Hall to determine if there was an overrepresentation of printers in the building. A walk-through of the first floor revealed nine full-size multifunction printers on the floor, many in close proximity to one another. These findings demonstrate that there may be an opportunity to reorganize and reduce the number of building printers and increase efficiency.



Current printers in Parrish Hall, first floor as of April 2024 (left) and proposed plan to reduce and make printing more efficient (right)

FUTURE WORK AND RECOMMENDATIONS

Going forward, important considerations for improving printing sustainability include reforming pedagogical practices to reduce paper use, adopting a printing quota, collaborating with other institutions to source 100% post-consumer recycled paper, and more. These recommendations were proposed and accepted by the Sustainable Printing Project Board and will provide critical direction to ITS and the Office of Sustainability to reduce Swarthmore's printing waste.



ELECTRIC VEHICLES IN THE BOROUGH



Jacob Herbold '26, he/him

PROJECT TEAM

Project Mentors:

Philip Coleman, member of Swarthmore Borough Environmental Advisory Council;
Elizabeth Drake, director of sustainability

Project Board Members:

Swarthmore Borough Environmental Advisory Council

Sustainability Sage:

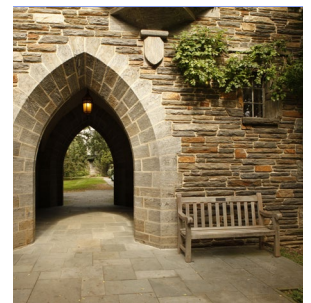
Kyle Richmond-Crosset '19

MISSION

This project aimed to identify and pursue funding opportunities for electric vehicle (EV) charging stations in Swarthmore Borough by investigating suitable federal and state grants and preparing the Borough to apply for funding. Through this collaboration, Swarthmore College's Office of Sustainability aims to support climate action in the surrounding community and foster continued collaboration with the Borough's Environmental Advisory Council.

BACKGROUND

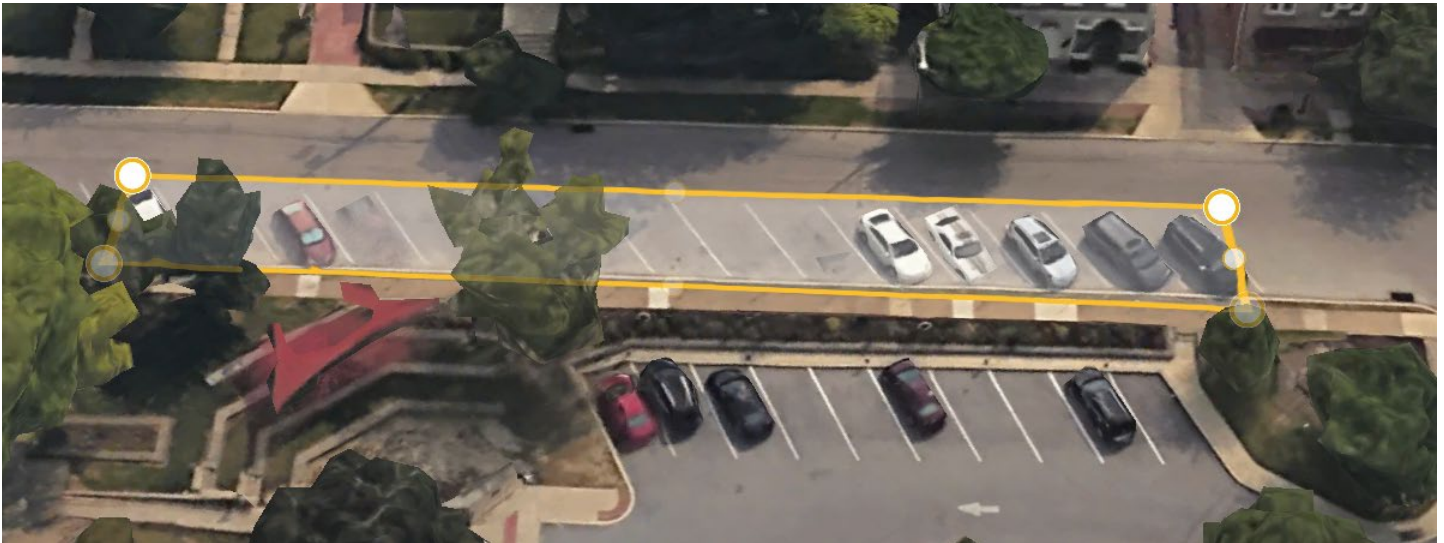
In 2019, the Swarthmore Borough [passed a resolution](#) committing Swarthmore to reaching 100% renewable electricity use in all homes, businesses, and government buildings within the borough by 2030 as part of the [Ready for 100 initiative](#). Borough Council also resolved that transportation, heating, and cooling energy will be generated by renewable sources by 2050. Efforts are underway to advance renewable electricity in the Borough, but less work has been done to evaluate and advance strategies for decarbonizing transportation.



OUTCOMES

Jacob worked with his mentors and other community partners to evaluate many different federal grant opportunities, including exploring a multi-municipal grant application. However, based on recent awards, it became apparent that Swarthmore may not be a competitive applicant for the programs under consideration, so the project instead pivoted to focusing on another suitable grant opportunity: the [PECO Public Benefit Charging Program](#). This program would cover 50% of the total project cost to buy and install charging stations in the Borough. Jacob worked to gather information necessary to complete an application, determine potential charging partners, and identify potential charging locations.

The top candidates for charging locations are the Borough parking lot and the parking spaces along Park Avenue, next to Borough Hall. Both locations are centrally positioned and in proximity to the Borough electric panel. Other locations considered were the Swarthmore Rutledge School parking lot, Children and Adult Disability & Educational Services parking lot, along Dartmouth Avenue, and in front of the CO-OP. The Swarthmore Centennial Foundation was also consulted about incorporating charging stations into their [plan to redevelop Myers Avenue](#).



One of the promising locations considered for EV charger installation is along Park Avenue in front of Swarthmore Borough Hall.

FUTURE WORK RECOMMENDATIONS

Next steps include finalizing the charging locations in order to submit a formal application to request funding under the PECO Public Benefits Charging Program in collaboration with our contact at PECO. Time should also be allocated to solidify additional funding sources to cover the remaining 50% gap in funding. Jacob looks forward to working with the Borough on this project Fall 2024 as a senior fellow and will continue work with the Borough over the summer to submit preliminary budgeting information by June and a full request for funding by September. Finally, students valued the opportunity to tell their stories of environmental justice and this could be continued in future years.



Slate Hyacinthe '24, they/them

PROJECT TEAM

Project Mentors:

Jeff Jabco, director of grounds & coordinator of horticulture for the Scott Arboretum;
Lars Rasmussen, assistant garden supervisor for the Scott Arboretum

Project Board Members:

Crum Woods Stewardship Committee, whose members include Andy Feick, associate vice president for sustainable facilities operations & capital planning; Betsy Bolton, Alexander Griswold Cummins professor of English; Claire Sawyers, director of the Scott Arboretum; Cynthia Ruimin Shi '23, sustainability & engaged scholarship fellow; Hansjakob Werlen, professor and section head of German studies; José-Luis Machado, associate professor of ecology; Maurice Eldridge '61; Nick Forrest '08, marketing and communications specialist; Randall Exon, Sara Lawrence Lightfoot professor of art; Sue MacQueen, campus engagement coordinator for the Scott Arboretum

Sustainability Sage:

Yarrow Syskine '22

MISSION

The Crum Woods is one of the last remaining forested areas in Delaware County and an invaluable natural resource for the campus and the surrounding community. Swarthmore College is committed to its ongoing restoration and stewardship. Working with the Crum Woods Stewardship Committee, this project aimed to secure a feasibility study for the Harris Dam removal, complete a meadow restoration project, and investigate water quality monitoring of the Crum Creek.

BACKGROUND

The removal of the Harris Dam on Crum Creek was identified in the Crum Woods Restoration and Stewardship and Plan as an opportunity for the College to help restore the ecological functioning of the creek. A feasibility study on the removal of the dam will evaluate if and how the dam could be removed, what the ecological and structural considerations would be, how the site could be restored, and how much this work would cost. The meadow near Crumhenge needed new plants better suited to the water-heavy environment of the floodplain. Long-term water quality monitoring in the Crum Creek has existed before, primarily through the work of Professor Emeritus Arthur E. McGarity up until the early 2010s. Re-launching research or taking initial samples will help to better understand the Creek's quality and assess the effectiveness of the recent stormwater management initiatives.



OUTCOMES

Harris Dam Removal

Extensive research was done on the permitting process and history of the Harris Dam including insight from past dam removals in the area. Companies that could be contracted to complete the feasibility study were identified and screened; a company was identified to move forward with a request for proposal.

Meadow Restoration

The meadow restoration was designed with floodplain conditions in mind and was an avenue to try out new planting techniques and created an opportunity for community engagement. In the spring, 15 Ridley High School students participated in the meadow planting, an event that was well received by both students and counselors. Slate put together a meadow field guide that can be used in future experiences in the meadow.

Water Quality Monitoring

Research and some initial sampling was done with small water quality test kits, but no substantial data was collected due to funding and capacity constraints. Several professors were consulted about potential interest in incorporating this work into their future curricula.



Led by PSRF Slate Hyacinthe '24 and project mentors Jeff Jabco and Lars Rasmussen, high school students and additional volunteers participated in a Crum Woods meadow planting in April 2024.

FUTURE WORK AND RECOMMENDATIONS

Now that a company has been identified, the College can move toward a request for proposal for the Harris Dam's removal. The meadow planting with Ridley High School was extremely successful and has great potential to continue annually, which would also be a great opportunity for students to experience the meadow as it grows. Monitoring should continue to assess if the new plants are better suited for wet conditions. The meadow field guide can be used in future projects, or be put up as a permanent installation around the meadow. To allocate more resources for water quality monitoring in the future, great starting points would be pursuing opportunities for research collaborations, grants, and community engagement.



Isabela Ibrahim '25, she/her

PROJECT TEAM

Project Mentor:

E. Carr Everbach, Isaiah V. Williamson Professor of Civil & Mechanical Engineering and professor of environmental studies

Project Board Members:

Food Systems Working Group, whose members include Anthony Coschignano, associate vice president for campus services; Andy Feick, associate vice president for sustainable facilities operation and capital planning; Brittany Pizio, registered dietitian; Clare Hyre, associate director of sustainability; Cynthia Ruimin Shi '23, sustainability & engaged scholarship fellow; Earnest Cherry, assistant director of residential dining; Elizabeth Drake, director of sustainability; Jeff Jabco, director of grounds & coordinator of horticulture for the Scott Arboretum; Jennifer Pfluger, visiting assistant professor of biology and environmental studies; Paige Jennings, director of gender and sexuality, Division of Student Affairs; Richard Green, associate director, Swarthmore Dining; Rhonda Hilt, greenhouse and garden manager; Sue MacQueen, campus engagement coordinator of Scott Arboretum; Tiffany Thompson, associate dean of inclusive excellence; Timothy Smith, retail manager, Swarthmore Dining

Sustainability Sage:

Alice Evans '10

MISSION

The Farm Feasibility Study project is part of an effort to establish a pedagogical farm at Swarthmore College by demonstrating that its creation is not only feasible, but also extremely desirable. A campus farm would serve as a living laboratory to create and support educational opportunities. In addition to curricular and co-curricular tie-ins, this space would foster community relationships, uplift well-being, and support the College's sustainability goals. This PSRF project explored the possibility of creating meaningful learning experiences by repurposing underutilized land into a pedagogical farm.

BACKGROUND

Despite the College's progress in various sustainability endeavors, there remains untapped potential to advance sustainable food systems on campus. Capstone projects, benchmarking reports, and work by previous PSRF Sophia Schlenz '24 highlight the growing student interest in food systems. Likewise, the Food Systems Working Group promoted the establishment of a campus farm in January 2023 through a white paper produced as part of the College's strategic planning process.

OUTCOMES

The objective of this project is to advance efforts to create an educational farm at Swarthmore by evaluating its feasibility and generating campuswide enthusiasm. Isabela and her mentor identified College-owned property at 302 Avondale Lane as a desirable site for a potential farm. Located across the Crum Woods, this space holds 1-2 acres of underutilized land. Soil tests demonstrated great soil health and a solar study revealed plenty of sunlight available during the growing season.



Google Earth view of 302 Avondale Lane total area by the Crum Woods, highlighted in yellow (left). Potential farm site landscape in early fall 2023 (right).

Through 13 faculty interviews, Isabela identified potential curricular tie-ins and emphasized how at least nine academic departments could benefit from the establishment of a farm in the identified space. Aligning with the goals of [Swarthmore Forward](#), faculty members highlighted how a farm promotes the education of the whole student and supports mental and emotional health and well-being. Discussions included conducting scientific research, exploring the crucial role of food in human culture, and emphasized community engagement and Indigenous knowledge, showcasing the farm as a source of joy and healing in education.

This project established a small prototype farm in the space where potatoes were planted. To enhance the prototype farm’s learning component, comparison plots were set up to determine their effect on potato yields. Spud Fest, planned for September 2024, will be an opportunity for students, faculty, and staff to harvest the potatoes, and roast and enjoy them at Swarthmore’s potential future farm.



Under the guidance of Rhonda Hilt, soil was prepared by rototilling the plot (left) prior to a potato-planting event with the PSRF cohort and teaching team (right).



The PSRF cohort engaged by making comparison plots with treatments of compost (left) and cover crops of white clover (right).

FUTURE WORK RECOMMENDATIONS

Moving forward, the priority for early fall 2024 is organizing Spud Fest, the potato harvesting event scheduled for September 19. Isabela will also explore partnerships with local farmers and organizations, such as [Farmer Jawn](#). Such a partnership could provide operational support for the farm while also creating opportunities for student workers, class visits, workshops, or the possibility of providing campus-grown food to the dining menu. The expansion of curricular tie-ins, by engaging other interested faculty, will motivate more research projects at the potential farm site.

AIR TRAVEL EMISSIONS



Oviya Kumaran '24, she/her

PROJECT TEAM

Project Mentor:

Hannah Ulloa, climate action manager

Project Board Members:

Alan Riddle, director of Swarthmore Fund leadership programs; Andy Feick, associate vice president for sustainable facilities operations and capital planning; Chris Kane, director of procurement; Elizabeth Drake, director of sustainability; Ernest Wright, budget director; Lauren Owens, director of operations, Global Engagement Office; Nicole Dianzumba, senior assistant dean of admissions, director of diversity and outreach; Ryan Jin '24

Sustainability Sage:

Alana Ballagh '22

MISSION

Swarthmore is committed to [carbon neutrality by 2035](#). In order to achieve this goal, the College must eliminate or offset all greenhouse gas emissions, including indirect scope 3 emissions, which includes College-funded air travel. This project aimed to enhance our understanding of the impact of air travel on emissions and develop effective strategies to mitigate these emissions.

BACKGROUND

In 2019, College-funded air travel accounted for approximately 17% of the College's total greenhouse gas emissions. By instituting an [air travel carbon fee](#) of \$11 per flight itinerary in 2022, Swarthmore has already taken steps toward addressing this issue. This project sought to build on that foundation by analyzing industry trends, including those of the airline industry and initiatives from the International Civil Aviation Organization and the Federal Aviation Agency, and making recommendations for improving Swarthmore's efforts to mitigate the impact of air travel.



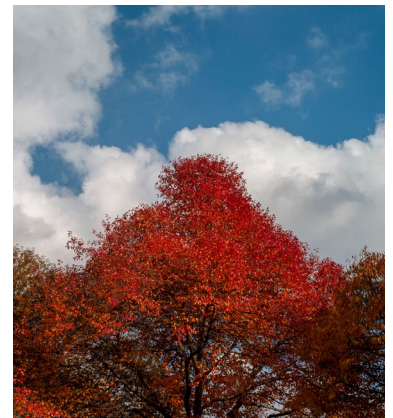
PSRF Oviya Kumaran '24 and project mentor and Climate Action Manager Hannah Ulloa in Dubai for COP28, an example of College-funded air travel, where they learned more about global air travel issues

OUTCOMES

Research revealed that Swarthmore's commitment to carbon neutrality by 2035 surpasses international goals for aviation, which are focused on carbon-neutral growth and longer time horizons for achieving net zero. This suggests that the College should continue to explore opportunities to reduce air travel emissions and invest in meaningful carbon offsets to achieve our climate goals. Through interviews with key stakeholders and an examination of air travel transaction data, the project identified significant gaps in current tracking methods, especially concerning restricted and endowed funds not yet subject to the air travel carbon fee. To address these gaps, recommendations include refining the air travel fee structure annually based on actual emissions data to reflect true environmental costs, and extending the fee to encompass all funding sources to ensure fairness and effectiveness. Additionally, Oviya developed educational materials to better inform the College community about sustainable travel options and the importance of emissions reduction. These materials aim to increase awareness and engagement, ultimately improving the efficacy of the air travel carbon fee program. Oviya also produced a report about current trends in the aviation industry, particularly around carbon neutrality and offsetting commitments.

FUTURE WORK RECOMMENDATIONS

Building on this work should entail enhancing data-tracking methods to ensure comprehensive accounting of all travel and continuing to foster a culture of sustainability within the College community. Through a combination of strategic policy refinements, enhanced data collection, and robust community engagement, the College can make meaningful progress towards its carbon neutrality goal and inspire similar efforts at other educational institutions and beyond. This project underscores the importance of proactive management of air travel emissions as part of Swarthmore's broader sustainability commitments.





Clara Lee '26, she/her

PROJECT TEAM

Project Mentor:

Christopher Graves, Environmental Studies Program coordinator, professor of chemistry and biochemistry and environmental studies

Project Board Members:

Chip Proctor, environmental services manager; Clare Hyre, associate director of sustainability; Colleen Marie Battista, environmental health and safety officer; Ian McGarvey, scientific instrumentation specialist for chemistry and biochemistry

Sustainability Sage:

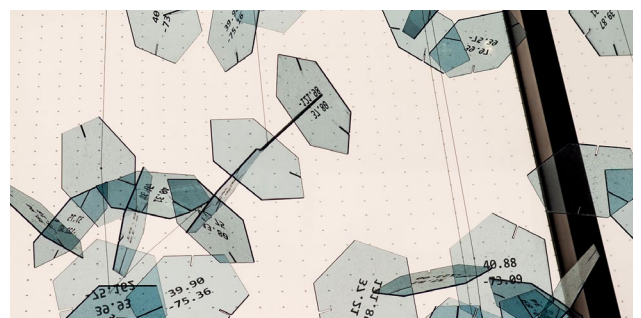
Bethany Bronkema '22

MISSION

This project aimed to identify an avenue to divert nitrile glove waste from the Reworld Incinerator in Chester, Pa., through glove recycling and to identify other ways of improving Swarthmore College's lab sustainability.

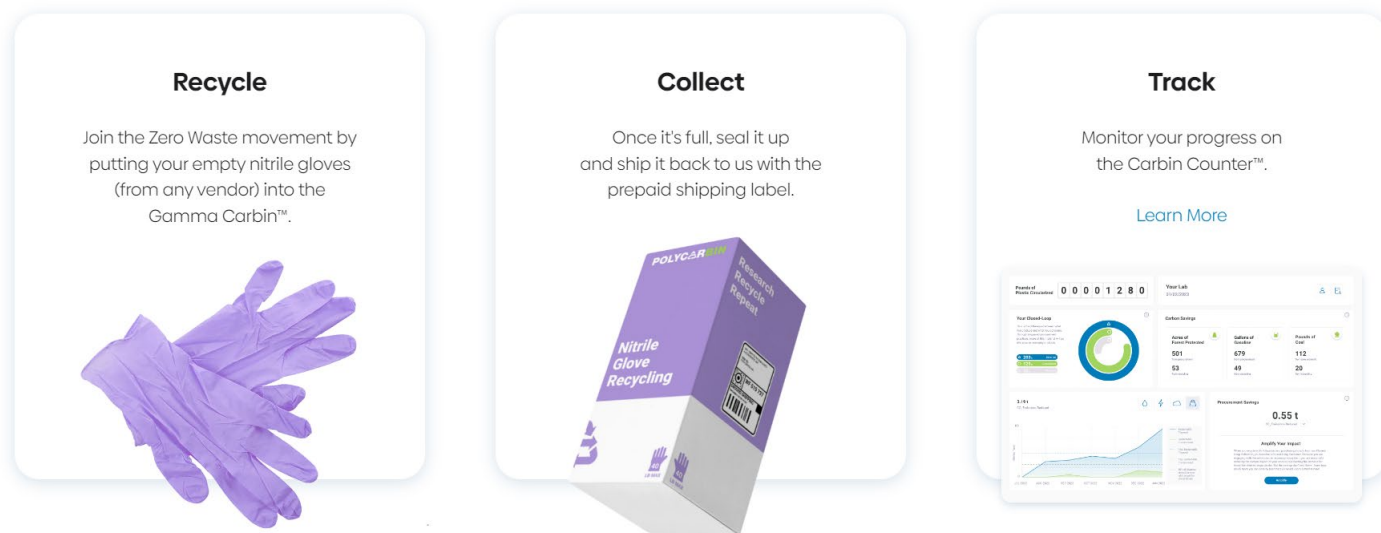
BACKGROUND

Campus laboratories generate a large amount of single-use waste, with disposable gloves being a primary example. The College has a chemical hygiene plan in place to manage chemical and hazardous waste, but we do not currently have an in-depth understanding of other waste streams produced by labs and how this waste could be recycled or diverted from incineration. Given the College's commitment to achieve [zero waste by 2035](#), it is imperative that we develop solutions for sustainably managing non-hazardous lab waste.



OUTCOMES

Clara conducted a substantial amount of research to identify a suitable glove recycling company that would offer waste diversion metrics (i.e. pounds of waste diverted, carbon emissions emitted/saved); offer a recycling process that is easy to use and adds little-to-no extra work on EVS or lab instructors; adhere to ethical, environmental justice-based practices that prioritize social responsibility; and have a strong worker safety policy. After consulting with lab specialists from other universities, PolyCarbin, a smaller recycling company dedicated to recycling non-hazardous lab waste, was found to be the most suitable option. Clara will be working with the Chemistry Department to pilot this initiative in the fall, with the hopes of rolling it out across Natural Sciences and Engineering departments in the future.



PolyCarbin's glove recycling program was identified as the most suitable as it offers easy implementation, waste diversion metrics, and considers ethical worker safety.

FUTURE WORK RECOMMENDATIONS

Beyond glove waste, Clara also identified other areas where sustainability in labs could be improved by promoting energy efficiency and process changes within labs. Fume hoods use a substantial amount of energy in labs, as they continuously suck up heated/cooled air. To improve energy efficiency, labs should start a [Shut the Sash](#) campaign, where proper labeling reminds researchers to shut fume hood sashes after finishing all chemical work. Additionally, the [Freezer Challenge](#) incentivizes researchers to establish more sustainable cold room practices to improve lab energy efficiency.

Additionally, lab instructors pointed out concerns about cross-contamination waste. When students work with chemicals, they may need to use their personal devices to do calculations and would need to switch gloves every time to avoid cross-contamination. A solution is to reorder lab curriculums to have students do all chemical work first, and then all computational work afterwards.

Clara will continue her work as a senior PSRF next year to support the glove recycling program and other lab sustainability initiatives.



The Shut the Sash initiative reminds lab users to close fume hood sashes to reduce energy consumption.

PILOT FOOD RECOVERY INITIATIVE



Saumya Raj '25, she/her

PROJECT TEAM

Project Mentor:

Clare Hyre, associate director of sustainability

Project Board Members:

Ben Shalk, assistant director of student activities and leadership; Brendan Carr, sustainability and engaged scholarship fellow; Deb Sloman, administrative assistant, classics and interdisciplinary programs; Juliana Lin '22, civic and environmental engagement fellow; Matthew Ramus, catering manager, Swarthmore Dining; Tom Ramsey, executive chef, Swarthmore Dining

Sustainability Sage:

Huiying Xiao '23

MISSION

This project aimed to reduce food waste and enhance food security on campus by creating an efficient system to recover, store, and redistribute surplus food from catered events. By devising strategies to efficiently manage food leftovers, the project built on the existing [Green Events Guide](#) to bridge the gap between excess food supply and the demand for food resources, particularly during off-hours when dining services are unavailable.

BACKGROUND

The College has committed to achieving [zero waste by 2035](#) and has a comprehensive zero waste plan in place. However, very little work has been done on campus on the topic of food recovery, especially from catered events. Research reveals that students, faculty, and staff believe that the campus would benefit from a food recovery initiative that makes leftover edible food available to the community. Benchmarking research demonstrates that many other schools have food recovery programs that donate food to off-campus partners, but few models exist already for repurposing edible food for on-campus consumption.



OUTCOMES

After learning more about current campus dining practices and researching possible solutions, Saumya concluded that a centrally located refrigerator for leftover food would be the best mechanism for food recovery. Working with campus stakeholders including Facilities, the Office of General Counsel, Swarthmore Dining, and others to evaluate possible locations based on electrical supply, accessibility, and other considerations, she identified a viable location in the Science Center for a refrigerator. She secured an [Amplify Grant](#) to fund the refrigerator and related equipment, which will be installed this summer. She also developed protocols for health and safety and the ongoing management of the fridge.

FUTURE WORK RECOMMENDATIONS

Saumya will be continuing her work as a senior fellow and anticipates having all necessary infrastructure in place to pilot the program during the Fall 2024. A primary goal as operations begin is to foster widespread awareness of the initiative across the campus, including the development of various informational materials. Additionally, a series of educational workshops will be hosted to highlight the environmental and social consequences of food waste and the positive impacts of participating in the food recovery program.

To ensure the initiative's success and sustainability, training workshops for students, faculty, staff, and event organizers will be conducted. These workshops will cover detailed protocols on the proper use of the food recovery station, responsibilities for maintaining cleanliness and efficiency, and guidelines for safe food handling practices. The aim is to cultivate a culture of responsibility and care around the new resource.

As the initiative progresses, several areas have emerged for further exploration to enhance its effectiveness, including incorporating community feedback to enhance functionality and user-friendliness; developing behavioral change strategies to influence event organizers to order food more accurately; and investigating interventions to reduce waste at events. These strategies aim to not only reduce food waste but also to enhance the overall event experience by ensuring that food availability aligns more closely with attendees' needs and expectations.

Food Recovery Initiative Room Design



This diagram outlines the organization of the space that will become the Food Recovery Room.



Lindsey Turner '25, he/him

PROJECT TEAM

Project Mentor:

Jordan Landes, curator, Friends Historical Library

Project Board Members:

Amy McColl, associate director of collection management and discovery and Tri-College licensing librarian; Domenic Porrini, director of sustainable maintenance operations; E. Carr Everbach, Isaiah V. Williamson Professor of Civil & Mechanical Engineering and professor of environmental studies; Elizabeth Drake, director of sustainability; Susan Smythe, ADA program manager and senior project manager

Sustainability Sage:

Nusaybah Estes '21

MISSION

McCabe Library houses the Special Collections – the Friends Historical Library, Peace Collection, College Archives, and Rare Book Room – which require strict environmental conditions to prevent degradation of the materials housed therein. Simultaneously, the College is pursuing ambitious energy efficiency targets to reach [carbon neutrality by 2035](#). This project aimed to gain an understanding of how to meet goals for both preservation and efficiency in McCabe Library and envision its sustainable short- and long-term sustainable future.

BACKGROUND

As books and articles become accessible online, physical college and university archives are emphasized for their uniqueness. The Special Collections has many valuable and educational items, including Jane Addams's Nobel Prize medal, Bayard Rustin's Poor People's March plans, and the first print appearance of Leonardo da Vinci's mechanical investigations. Physical archives also facilitate important partnerships; recent projects of the Special Collections include partnering with the National Native American Boarding School Healing Coalition. Last year, there was a 59.5% increase in the number of appointments made by faculty, staff, and students to access the archives for academic purposes.

Standard conditions for paper collections are 35-65°F and 30-50% relative humidity. McCabe Library struggles to maintain these conditions, especially since most of the building shares HVAC between offices and archives, which have different needs. This has led to damaging conditions, such as floods and a mold bloom. There needs to be an approach to managing the building that balances preservation and energy consumption.



Comparison of Rare Books during and after the white mold bloom in 2021

OUTCOMES

Data Collection

Twenty-two data loggers were installed to better monitor, quantify, and communicate the microclimates of the building. The [eClimateNotebook](#) software was used to streamline collection to analysis. This work resulted in nine months of data gathered, staff training on the monitoring system, and interest in expanding the project.

Documentation

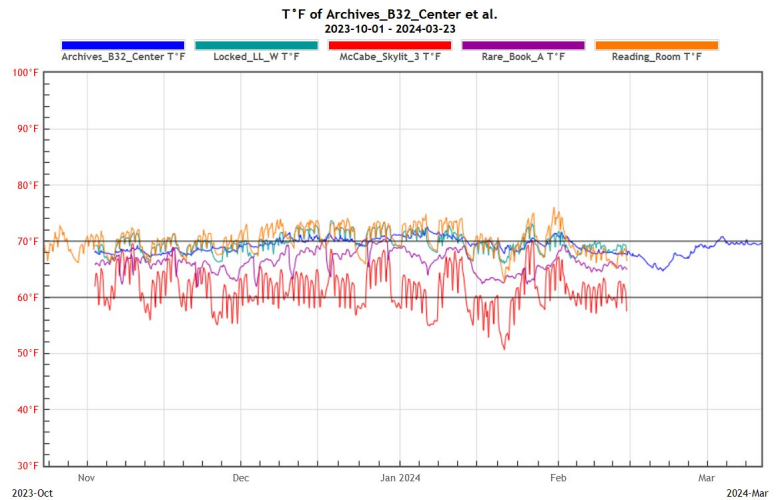
A baseline was established by cataloging McCabe Library. Through tours with Facilities, upgrades, equipment, ductwork, and concern areas were all identified. Communication between the Libraries and Facilities staff members became more transparent, adaptations to better preserve materials while supporting the College's sustainability goals were brainstormed, and important institutional knowledge was preserved.

Research

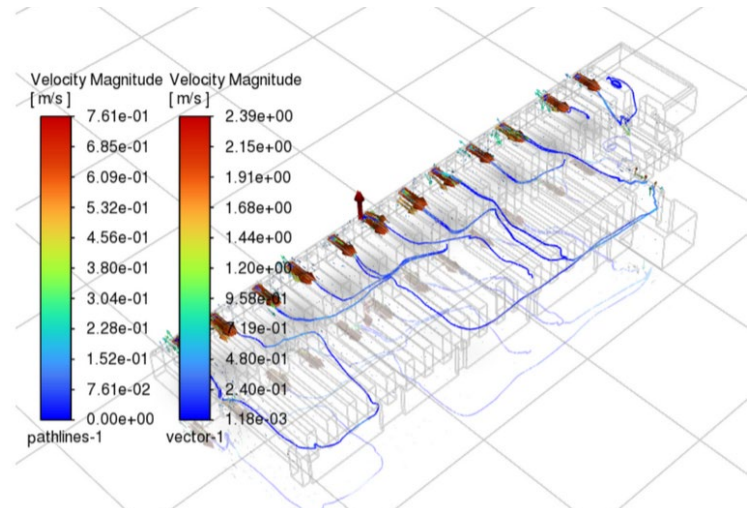
Documentation revealed that altering the layout of shelving could improve airflow. Using 3D models and real-world experiments, it was found that moving the air scrubbers, portable filtration systems that improve air quality, makes a noticeable difference in temperature. Through case studies, publications, and interviews, building renovations were explored. A report compiled these findings into digestible steps ranked by impact and feasibility.

Engagement

The project was presented at a Library all-staff meeting with very positive reviews from staff members. Additionally, an ice cream social was hosted to start generating enthusiasm from the Libraries staff members who will play critical roles in forwarding this work.



Graph generated from eClimateNotebook showing temperature trends in different locations of the archives



Pathlines and velocity field from airflow model of basement using Ansys Fluent

FUTURE WORK RECOMMENDATIONS

The data proves that controlled environments like the Rare Book Room significantly increase preservation, demonstrating more isolated archives are a worthy investment. The loggers will continue to be an invaluable tool in decision making. Future work includes creating an updated energy model, developing a timeline for implementing recommendations, and studying the Libraries' energy footprint, including Cornell and Underhill. Future research could also evaluate the environmental impact of other activities such as transportation of materials, off-site storage, and digital storage. Finally, increased engagement could enhance how Libraries and archives can continue to serve as radical public spaces.



SENIOR PRESIDENT'S SUSTAINABILITY RESEARCH FELLOWSHIP

This year, the PSRF program supported a previous PSRF fellow to return as a senior fellow and advance campus sustainability.

Ryan Jin '24, he/him



GREENHOUSE GAS INVENTORY:

This year, Ryan worked with Climate Action Manager Hannah Ulloa to conduct the College's annual greenhouse gas inventory and support the [Carbon Charge Working Group](#) with research and analysis to reduce campus carbon emissions. To complete the FY23 greenhouse gas inventory, Ryan reached out to several campus stakeholders to gather necessary data related to energy, water, waste, paper, air travel, ground travel, etc. Some data sources required further analysis, which Ryan conducted while carefully taking notes and labeling updates for future reference. Ryan then input all data into the Sustainability Indicator Management & Analysis Platform, a widely recognized online tool for greenhouse gas accounting. With these results, Ryan analyzed year-to-year trends and created charts for the annual greenhouse gas inventory report. The [final report](#) [PDF] was then posted on the Office of Sustainability website.

Reflecting on the year, Ryan believes this inventory is extremely important for the College's climate goals because it tells us how our emissions are trending and demonstrates the impact of changes we're making to campus to achieve our carbon neutrality goals. After completing his second year as a PSRF and third year working with the Office of Sustainability, Ryan also shared that he would like to "thank this truly special office for supporting me, our PSRFs, Green Advisors, interns, and engaged fellows in our endeavors to explore and implement sustainable practices and systems both here and beyond Swarthmore."



SWARTHMORE

QUESTIONS? COMMENTS?

Reach us at sustainability@swarthmore.edu or learn more at bit.ly/psrf.