

PRESIDENT'S SUSTAINABILITY RESEARCH FELLOWSHIP

Annual Report
2022-2023

PRESIDENT'S OFFICE
ENVIRONMENTAL STUDIES
OFFICE OF SUSTAINABILITY
LANG CENTER FOR CIVIC AND SOCIAL RESPONSIBILITY

SWARTHMORE

LETTER FROM THE PRESIDENT



Friends,

When I think of the President's Sustainability Research Fellowship, I see 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 receive the unanticipated lessons that life has to teach. This program reminds me that Swarthmore changes 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 to develop solutions for 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 me personally and to our entire campus. Special thanks to James Padilioni, visiting assistant professor of religion and environmental studies, and to Carr Everbach, Isaiah V. Williamson professor of civil and mechanical engineering and environmental studies, who served as faculty leads for the PSRF program during the 2022-23 academic year. I am also deeply grateful to Elizabeth Drake, director of sustainability, and Alex Flowers '21, sustainability and engaged scholarship 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.

I look forward to the eighth year of the President's Sustainability Research Fellowship and meeting with the new cohort of fellows.

With gratitude,
Val Smith,
President

WHAT IS PSRF?

In the President's Sustainability Research Fellowship (PSRF) at Swarthmore College, students learn by leading, taking stewardship over 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 and produce replicable solutions for our campus and beyond.



President Smith, fellows, mentors, and teaching staff gathered in October 2022.

YEAR IN REVIEW

In the program's seventh year, the yearlong course was taught by Professor of Religion and Environmental Studies James Padilioni and Professor of Engineering and Environmental Studies Carr Everbach, alongside Director of Sustainability Elizabeth Drake. Seven students were selected to participate in the program, taking part in six 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 who participated in PSRF while at Swarthmore — for project consultation and mentorship.

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 piloted an e-waste recycling program with partner PAR Recycling, conducted research to prepare Swarthmore for the increasing popularity of electric vehicles, engaged local fifth graders in the restoration of Crum Woods, and so much more.

In May 2023, over 100 people attended PSRF final presentations to celebrate the fellows in person and online. We invite you to read on for project summaries of the 2022-2023 PSRF cohort.



Over 100 people attended the May 2023 final presentations.



PSRF Anna Considine '23 responds to a question from the audience.

PSRF TEACHING TEAM 2022-23



Elizabeth Drake

Director of Sustainability
PSRF Co-instructor



James Padilioni

*Faculty, Religion &
Environmental Studies*
PSRF Co-instructor (Fall)



Carr Everbach

*Faculty, Engineering &
Environmental Studies*
PSRF Co-instructor (Spring)



Alexander Flowers '21

*Sustainability & Engaged
Scholarship 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 at least one fellow annually.

This year's Class of 1968 fellows were Viktoriia Zakharova '24 and Ryan Jin '24.



Viktoriia Zakharova '24



Ryan Jin '24

Susan Lamb '82 and Rick Seavey Fellow

Thanks 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 Daniela Kim '23.



Daniela Kim '23

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!

PROJECT SUMMARIES

Crum Woods Engagement . . pg. 6

Daniela Kim '23

Electronic Waste pg. 8

Viktoriia Zakharova '24

Environmental Justice pg. 10

Anna Considine '23 and Darid Prom '24

Hawai'i Relationships pg. 12

Catherine Atalig '23

Retail Food Tracking pg. 14

Gary Chen '25

Vehicle Electrification pg. 16

Ryan Jin '24

Senior Fellows pg. 18



From left to right: Gary Chen '25, Daniela Kim '23, Viktoriia Zakharova '24, Ryan Jin '24, Darid Prom '24, Anna Considine '23, Catherine Atalig '23

CRUM WOODS ENGAGEMENT



DANIELA KIM '23, SHE/HER

Project Team

Project Mentor: Carolyn Bauer, Assistant Professor of Biology

Project Board Members: Jeff Jabco, director of grounds and coordinator of horticulture; Lars Rasmussen, assistant garden supervisor and plant health; Rachel Warren, Scott Arboretum assistant education programs manager for youth, families, and diverse audiences; Sue MacQueen, Scott Arboretum campus engagement coordinator; Alex Flowers '21, sustainability and engaged scholarship fellow; Megan Rossman, public horticulture intern; and Jennifer Bradley, assistant professor of education

Sustainability Sage: Gavriela Mallory '17

Mission

This project is designed to create an opportunity for young students to experience their natural local environment in a positive way through engagement with the Crum Woods, so that they carry these memories with them, and build on their experiences with nature in the future.

Background

A key aspect of Crum Woods stewardship is to ensure that the Crum Woods are usable and accessible to the whole surrounding community. In the past, efforts to engage members of the community with the woods have focused primarily on adults and College students; one population that has not received much attention in this goal is children. Research shows that exposure to nature at a young age has many benefits, such as a reduction in stress and anxiety levels in children.

The recent construction needed for improved stormwater management in the Upper Crum Swale left the land barren, so restoration was needed to return plant life to the area. This project was an opportunity to provide local children with education on environmental conservation and to help them get away from the monotony of desk work. Daniela's planting events with fifth-grade classes from Swarthmore Rutledge School (SRS) helped reintroduce suitable plants and trees to the Upper Crum Swale. By interacting with their local environment and helping restore Crum Woods, young students learned sustainable practices and values that they can carry into their future.



Fifth-grade Swarthmore Rutledge School class interacting with Daniela in Swarthmore's amphitheater

Outcomes

Coordinated logistics with SRS school

Daniela worked with four fifth-grade teachers from SRS in planning the planting event. This involved soliciting permission from the principal as well as coordinating a group of volunteers from Swarthmore to assist with the event.

Developed curriculum for the visit

Daniela developed a curriculum that included key topics and learning outcomes for the students, and delivered it as a presentation to students in the lead-up to the event. Daniela visited the four participating fifth-grade classes to introduce the planting event a week before it took place, and taught the students about the different plants they would be planting, the schedule, take-home messages, and safety rules.

Planting event with kids from SRS

With the help of the Grounds crew, Arboretum staff, and her project board members, Daniela was able to have four successful planting days, with about 100 students participating in the planting of a total of 325 plants (perennials, woody plants, and live stakes). A reflection survey administered before and after the event showed students leaving the planting event with a greater sense of connection to natural spaces.



A fifth-grade SRS class planting live stakes by the Crum Creek

Future Work and Recommendations

Going forward, a PSRF fellow working with the Crum Woods Stewardship Committee could build on this year's work by leading another planting event or other form of engagement in the woods with different groups of school-age children.

If an event like this is replicated in the future, Daniela recommends contacting schools as early as possible and collaborating with the institutions' administrative assistants to get all necessary information and items, including legal forms, to the principal.

This event was successful because a multi-stage engagement model was used: Teachers explained planting concepts in class; Daniela visited each class ahead of time to introduce the event; students visited the woods for the planting event; and teachers administered reflection activities after the event. Daniela recommends using a similar model moving forward, as it reinforces key concepts and maximizes the event's positive impact on students.



ELECTRONIC WASTE RECYCLING



VIKTORIIA ZAKHAROVA '24, SHE/HER

Project Team

Project Mentor: Chris Kane, director of procurement

Project Board Members: Alex Flowers '21, sustainability and engaged scholarship fellow; Kelly Fitzpatrick, ITS business operations manager; Christopher (Chip) Proctor, environmental services manager of administration; Clare Hyre, associate director of sustainability; Jeff Knerr, computer science lab/system administrator; Mark Davis, director of IT support services; Colleen Battista, environmental health and safety officer; Christopher Graves, associate professor of chemistry and environmental studies and chair of environmental studies; Matt Powell, biology business and technology manager; Thomas Snyder, Lang Performing Arts Center manager of operations

Sustainability Sage: Eriko Shrestha '19

Mission

This project aimed to advance the College's efforts to become a zero waste campus by 2035, through its [To Zero by Thirty-Five](#) energy plan. Sustainable electronic waste management is an essential step towards achieving responsible production and consumption and for advancing the [United Nations Sustainable Development Goals](#). This project sought to create systems for responsibly managing electronic waste on campus and to minimize the amount of waste sent to the incinerator.

Background & Objectives

To ensure the College's electronic devices support the community's educational and operational needs, Swarthmore's ITS department has implemented a replacement policy in which every device used by staff and faculty for work is replaced periodically. As a result of this practice, old devices started accumulating and becoming a source of electronic waste on campus, as there was not an adequate established process for community members to recycle their non-reusable electronic devices.

E-waste on Swarthmore's campus has been a research topic for several years, led by students and the Office of Sustainability. Building on previous success, this year's project worked towards establishing a long-term partnership with an affordable e-waste recycling vendor, conducting a campus e-waste study through public e-waste collection events, and developing a centralized campus e-waste recycling system.

Outcomes

Contractor collaboration

In collaboration with campus stakeholders, Viktoriia helped establish an institutional partnership with [People Advancing Reintegration \(PAR\) Recycle Works](#), an e-waste recycling company based in Philadelphia. This resulted in several centralized collection events on campus and laid the foundation for future events, helping ensure a means of regular campus e-waste pickup for proper recycling. Apart from their e-waste sustainability goal, PAR has a social mission of providing transitional employment to people returning from prison to ensure they are supported throughout their reintegration process. Swarthmore now has a contract with PAR for long-term collaboration.

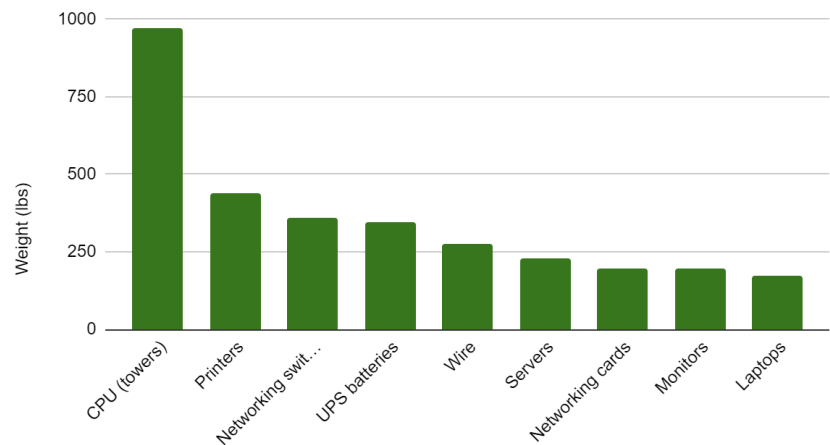


PAR Recycle Works workers, Viktoriia Zakharova, and Chris Kane conducting the fall (left) and spring (right) collection events.

E-waste collection events

With PAR, Viktoriia conducted two centralized e-waste collection events – one in the fall semester and one in the spring semester. Around 6,000 pounds of e-waste were collected in total. These events allowed students, faculty, and staff members to drop off their e-waste for recycling. These events were the first centralized recycling of departmental e-waste across the whole campus. They increased e-waste recycling awareness on campus and supported individual e-waste-generation data.

Fall E-waste Collection Results



Bar chart depicting total e-waste collected at both campus events, sorted by category.

Establishing a system for e-waste

To define a benchmark for Swarthmore’s e-waste recycling system, Viktoriia conducted interviews with Villanova University and Haverford Township. Both have well-established e-waste recycling programs conducted in partnership with PAR. With the help of Environmental Services, Facilities and Grounds, the Purchasing Office, the Office of Sustainability, and ITS, Viktoriia developed an e-waste recycling protocol with recommended procedures for managing departmental and individual e-waste, including hazardous devices, and both Swarthmore-owned and personal electronics. The protocol outlined the distribution of responsibilities, communication structure, and logistics process for centralized e-waste recycling on campus.

Future Work and Recommendations

This project successfully created and implemented a framework for a centralized e-waste recycling system on campus. Next steps include installing an e-waste drop-off bin, developing mechanisms for e-waste recycling communication and advertisement, implementing a work order execution, and instituting regular e-waste pickup.

Viktoriia recommends that Swarthmore continue to contract with PAR Recycle Works to ensure the institutional relationship remains strong. Swarthmore could also expand that relationship from solely e-waste recycling to cooperating with PAR in achieving their social goal of supporting further employment for previously incarcerated workers.

Organizing continued e-waste collection events would be beneficial as a transition to a regular e-waste collection protocol.

Once a regular e-waste collection mechanism is established, e-waste reports should be analyzed and archived in order to summarize e-waste distribution and diversion efforts on campus. E-waste stakeholders — such as ITS, the Computer Science Department, and Facilities and Grounds — should integrate their e-waste recycling mechanisms into a uniform, all-campus, e-waste recycling protocol.

ENVIRONMENTAL JUSTICE & COMMUNITY RESILIENCE



DARID PROM '24 (ANY PRONOUNS)

ANNA CONSIDINE '23 SHE/HER

Project Team

Project Mentors: Giovanna Di Chiro, professor of environmental studies and coordinator of environmental justice and community resilience, and Oswaldo Morales Solorzano '21, sustainability and engaged scholarship fellow

Project Board Members: Adrienne Benally, assistant professor of environmental studies; Elizabeth Drake, director of sustainability; Juliana Lin '22, civic and engaged scholarship fellow; Ashley Henry, Lang Center assistant director; Alex Flowers '21, sustainability and engaged scholarship fellow; James Padilioni, visiting assistant professor of religion and environmental studies; Carr Everbach, professor of engineering and environmental studies; Hulices Murillo '23

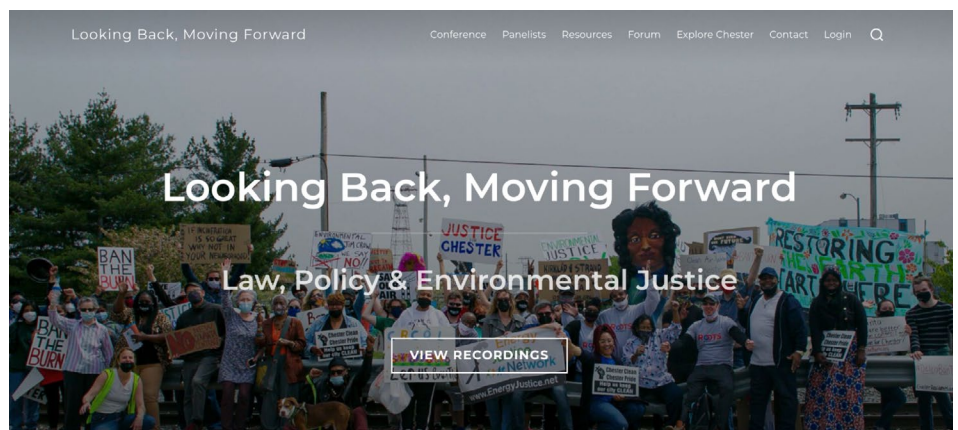
Sustainability Sages: Shayla Smith '20 and Patrick Houston '17

Mission

The project aimed to support an effective first year of the new [Environmental Justice and Community Resilience \(EJCR\)](#) program that launched in spring 2022. PSRF fellows Darid and Anna assisted with the launch and roll-out process of the EJCR program by developing a storytelling initiative on campus and facilitating focus groups with different Swarthmore student organizations. Through this work, the fellows uplifted and informed student understandings of environmental justice on campus.

Background & Objectives

The EJCR program, a new initiative of the [Lang Center for Civic and Social Responsibility](#), was created out of responses from a 2015 Sustainability Charette — a two-day series of speakers and workshops that included students, faculty, staff, and neighbors — wherein participants called for a center specifically dedicated to environmental sustainability and the advancement of social justice.



[Webpage](#) for the Spring 2022 Looking Back, Moving Forward Environmental Justice Conference.

Giovanna Di Chiro, professor of environmental studies and coordinator of environmental justice and climate resiliency, helped facilitate a soft launch of the program in spring 2022 by hosting the Looking Back, Moving Forward: Law, Policy & Environmental Justice Conference. Moving forward, the program seeks to advance critically engaged scholarship, racial and gender justice, and purposeful, campus-community collaborations with local partners and beyond. It will serve as a gathering space and support network, facilitating action research partnerships grounded in environmental justice and committed to forging diverse campus-community collaborations.

Two main goals guided the project: to take the pulse of current attitudes towards environmental justice in the student body and to help uplift student stories of environmental justice work.

Outcomes

In order to achieve project goals, Darid and Anna planned two tabling events, three focus groups, and one storytelling event. These events resulted in the following outcomes:

- Successful communication with the Swarthmore community about the existence and offerings of the EJCR program. Darid and Anna collaborated with Kitao Art Gallery and Green Advisors and offered light-hearted events bringing awareness to the environmental justice conversation and the EJCR program.
- Consultation with and understanding of the needs and wants of the student body in regards to environmental justice work and the program. Focus groups were conducted with i20 (international student club), first-generation low-income students, and the Campus Coalition Concerning Chester (C4). From these conversations, Darid and Anna consolidated a number of takeaways about student needs and hopes for the future of environmental justice work at Swarthmore.
- A broader sense of awareness of the intersectionality of the environmental justice movement on campus. Through collaboration with Lang Center Associate Natalie Fraser '24, Darid and Anna worked with several student storytellers to develop and craft their stories of environmental justice, which they then shared with an audience of 45 people.



Future Work and Recommendations

From the focus groups and events, Darid and Anna derived four key recommendations for improving EJ work at the College going forward. These include reducing barriers to engaging with environmental justice, addressing gaps in student knowledge, ensuring ethical engagement, and emphasizing storytelling.

Students expressed barriers to engaging in environmental justice work. Solutions can include developing more paid opportunities for this work, connecting students to existing resources, offering early exposure to environmental justice work, and providing class credit. Moreover, efforts should be made to ensure that all students at Swarthmore, not just those studying environmental justice, are clear on the definition of environmental justice.

This can help ensure that people working on these issues can continue to critically examine their work so as not to engage in savior mentalities and extractive practices.

Finally, students valued the opportunity to tell their stories of environmental justice and this could be continued in future years.

HAWAI‘I RELATIONSHIPS



CATHERINE ATALIG '23, SHE/HER

Project Team

Project Mentors: Elizabeth Drake, director of sustainability, and Oswaldo Morales Solorzano '21, sustainability and engaged scholarship fellow

Project Board Members: James Padilioni, visiting assistant professor of religion and environmental studies; Adrienne Benally, assistant professor of environmental studies; Carr Everbach, professor of engineering and environmental studies; Christopher Graves, associate professor and chair of environmental studies; Ben Berger, associate professor of political sciences and executive director of the Lang Center; Cynthia Ruimin Shi '23; and Alexander Flowers '21, sustainability and engaged scholarship fellow

Sustainability Sage: Max Katz-Balmes '20

Mission

For several years, Swarthmore has been engaged in partnerships with organizations in Hawai‘i through a number of programs, including summer fellowships, faculty visits, and co-hosted events at partnering universities, including the University of Hawai‘i. This programming has been an important opportunity for our community members to learn about different models of sustainability than those taught at Swarthmore – models deeply rooted in Indigenous Pacific Islander knowledge. The purpose of this project was to reflect on this existing programming and offer recommendations to ensure that the College is able to collaborate with Hawai‘i partners in a way that is mutually beneficial, not harmful to Native Hawaiians, and supports Hawaiian sovereignty and Indigenous knowledge. This project seeks to bring guidance to Hawai‘i programming in order to plan impactful and mutually beneficial collaborations.

Background & Objectives

The Hawai‘i partnerships and programming at Swarthmore began through Aurora Winslade, previous director of sustainability, and built on connections she established while living and working in Hawai‘i prior to joining the College. Since then, Swarthmore faculty and staff in the Office of Sustainability, the Lang Center for Civic and Social Responsibility, and the Environmental Studies Program have developed relationships with the University of Hawai‘i and several sustainability nonprofit organizations on the islands.

Since 2018, Swarthmore has sent students to Hawai‘i for fellowships with local organizations and the University of Hawai‘i Office of Sustainability. Swarthmore has also organized faculty and staff visits to the state to consider ways to make this programming more central to sustainability work being done at the College. Through many of these collaborations, our partners in Hawai‘i and Swarthmore students, faculty, and staff expressed that, while the summer programming was a very impactful extracurricular component to the student experience, the programming could be more intentional in how it connects to the College’s curriculum. Moreover, there could be more direct efforts to support our partners in Hawai‘i beyond sending honorariums for hosting students over the summer.

Higher education institutions, like Swarthmore College, have a social responsibility to be critical of their role in Indigenous erasure and colonialism, especially in their curriculum and other learning experiences. They also have a responsibility to prepare their community members to be better allies and leaders. Native Hawaiian and other Pacific Islander groups hold critical knowledge for living in reciprocal relationship with the land. Partnerships with these groups have been, and could continue to be, an important opportunity for the Swarthmore community to learn and support Indigenous sustainability knowledge and ecological stewardship.



Photos from the spring 2020 Huaka'i experiential learning trip attended by Swarthmore students, staff, faculty, and Chester residents.

Given this feedback from previous participants, this project was designed to reflect on the efficacy of our collaborations in Hawai'i, and to offer recommendations on how to improve them in the future, with a focus on ensuring these efforts are intentional, non-exploitative, and as mutually beneficial as possible.

Outcomes

The main outcome of this project was facilitating conversations with stakeholders at Swarthmore and in Hawai'i about how the program should look moving forward. From those discussions, a decision was made to pivot away from the summer fellowship program towards other models of collaboration that can occur during the semester and tie more closely into the College's Environmental Studies curriculum. Potential models for future collaborations include: promoting already existing opportunities to study domestically at the University of Hawai'i; incorporating a study trip to Hawai'i as part of a course taught at Swarthmore; and establishing an exchange program between the University of Hawai'i–West O'ahu and Swarthmore. Though we had previously worked with the University of Hawai'i at Mānoa more closely, we were able to identify that the West O'ahu campus exists in an area with a much larger population of Native Hawaiians and caters more directly to Indigenous students in their work. A partnership with that campus would be an opportunity to support concurrent efforts at Swarthmore focused on uplifting Indigenous perspectives and work.



Swarthmore community members have visited and interned at Paepae o He'eia Fishpond (left) and Ma'o Organic Farm (right), located across O'ahu Island.

This project convened faculty from Swarthmore College and University of Hawai'i–West O'ahu to begin brainstorming what an institutional collaboration could look like based around both sustainability and food systems education. These conversations established a working relationship between faculty at both institutions and outlined possible models of collaboration to be further explored.

Future Work and Recommendations

A relationship-building project can be a slow process, and this year marked the start of a potential new relationship between Swarthmore College and University of Hawai'i–West O'ahu. For this collaboration to be successful, there needs to be a more firmly established relationship between the institutions with clear staffing capacity and funding to support a partnership. Additionally, determining internal ownership of this program at Swarthmore will be an important next step as we define the parameters of a mutually beneficial collaboration.

RETAIL FOOD PROCUREMENT TRACKING



GUOHAO (GARY) CHEN '25, HE/HIM

Project Team

Project Mentor: Clare Hyre, associate director of sustainability

Project Board Members: Tim Smith, retail operations manager; Elizabeth Drake, director of sustainability; and Alexander Flowers '21, sustainability and engaged scholarship fellow

Sustainability Sage: Terrence Xiao '20

Mission

This PSRF project aimed to bring more transparency into Swarthmore College's food system by researching the College's food sourcing practices within Swarthmore Dining campus retail locations, including Essie Mae's, Science Center Café, and Kohlberg Café.

Background & Objectives

Swarthmore aims for a sustainable campus food system that prioritizes nutrition, sustainability, and responsible purchasing. The Food System Working Group (FSWG) focuses on the food supply chain, from production to consumption stages, on campus. However, there is a lack of data tracking for the pre-consumption stages of our supply chain. This project specifically addresses the food purchasing stage within the overall supply chain (Fig 1).

This project worked to establish a data tracking system for the pre-consumption stages of the College's food supply chain and provide valuable insights through research, surveys, and data analysis. We aimed to optimize food spending in the College's retail dining areas by aligning that spending with the College's sustainability vision and identifying areas for improvement in terms of sourcing food locally, ethically, and with greater emphasis on plants and minimal processing. The collected data will then inform decision-making by Swarthmore Dining and the Office of Sustainability to advance sustainability in the campus food system.

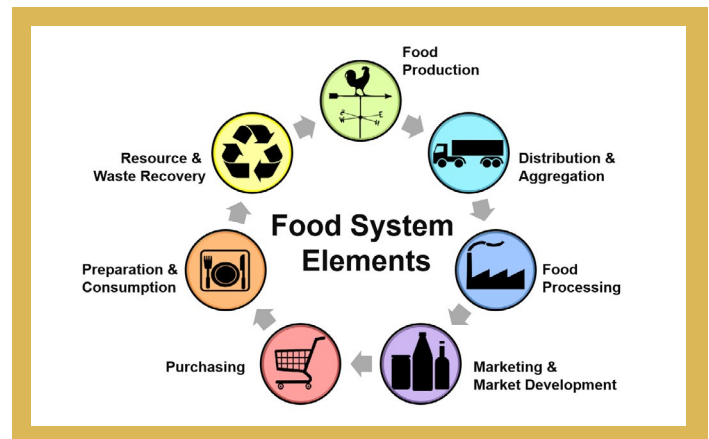


Fig. 1 Illustration of the food supply chain. Source: Cornell University

Outcomes

A retail food spending baseline survey was carried out using the Real Food Challenge framework, which encompasses six dimensions of campus food systems: dining management, employment, food supply chain, college meal plan policy, college social responsibility, and college food sustainability practices. “Real food” is defined as meeting at least one of the following criteria: local, ethical, eco-friendly, or fair. Through this project, we learned that 16% of our purchased food in retail dining locations qualifies as Real Food, and 21% is plant-based (Fig. 2). For reference, 20% is the target line set by the Real Food Challenge organization. These figures are conservative extrapolations based on four sampled vendors out of the 14 vendors Swarthmore Dining’s retail operations work with, and represent 40% of the College’s retail food spending. The project investigated these vendors on Real Food criteria and additional characteristics requested by Swarthmore Dining.

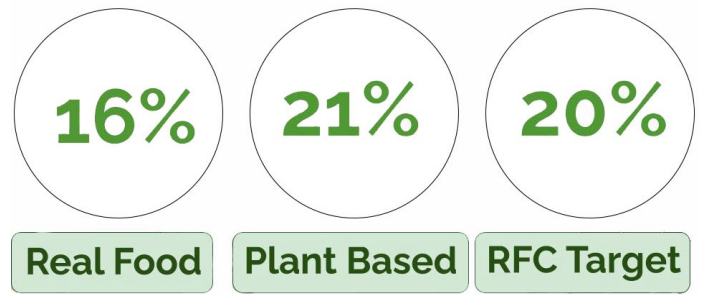


Fig.2 Estimated percentage of Retail expenditures that are Real Food or Plant-based. “RFC Target” is the Real Food Challenge’s target percentage for Real Food expenditures.

Future Work and Recommendations

Information collected through this project can be used by Swarthmore Dining and the Office of Sustainability to better understand our food sourcing practices. Gary created a comprehensive retail product spreadsheet for the Retail Dining department and Office of Sustainability that can help the College identify areas for improvements in food purchasing, promote sustainable food purchasing practices, and better align the College’s purchasing decisions with its vision for a sustainable food system. In particular, the retail product research suggests that [Artisan Exchange](#) is a food distributor network that merits continued partnership because of its local and social responsibility program.

In order to expand this kind of research to more campus operations, like the College’s new Dining Center, the process could be simplified by taking the following steps: collecting standard order invoices, translating them to spreadsheet format, researching purchased products and checking for the relevant characteristics, and using software developed for this year’s project to summarize the results. While it would be comparatively easy to search for a product’s certification status and characteristics like “gluten free” or “vegan,” it will likely be difficult to trace its production sources due to a lack of industry transparency. Related information could be potentially obtained through interviews or back-end database exploration. Even if tracing ingredients through distributor networks is challenging, Swarthmore can work to expand partnership sourcing with local businesses like Artisan Exchange.



VEHICLE ELECTRIFICATION



RYAN JIN '24, HE/HIM

Project Team

Project Mentors: Hannah Ulloa, climate action manager; Jim Adams, director of sustainable maintenance

Project Board Members: Elizabeth Drake, director of sustainability; Alex Flowers '21, sustainability and engaged scholarship fellow; Anthony Coschignano, associate vice president of campus services; Bill Maguire, maintenance manager; Roderick Wolfson, senior planner and project manager

Sustainability Sage: Sierra Spencer '18

Mission

As electric vehicle (EV) demand grows rapidly across the world, it is necessary for Swarthmore College to develop effective incentivization strategies for EV adoption. This PSRF project aimed to provide tools for this by deepening our understanding of the EV landscape on campus in the present and near future.

Background & Objectives

Historically, staff member commuting has accounted for approximately 9% of Swarthmore's total annual greenhouse gas emissions. To reduce that number in alignment with the Swarthmore's carbon neutrality commitment, the College has taken steps to incentivize EV adoption for faculty and staff by installing 16 EV charging ports which are free to use. While this was an important first step, it was not clear whether this system would be enough to support the expected growth of EVs in the future.

The flowchart below presents the timeline the PSRF project envisioned for developing EV incentives. In order to create effective incentives for EV adoption, the College should first install the proper infrastructure to meet EV adoption demand, which requires a deeper understanding of the landscape of EVs on campus both in the present and in the future. To achieve this, Ryan's PSRF project sought to:

- Characterize current campus EV chargers by examining charging models, potential energy usage, operational costs, etc.
- Determine availability of EV charger usage data and analyze current EV charger demand
- Identify methods of projecting future EV adoption for Swarthmore faculty and staff

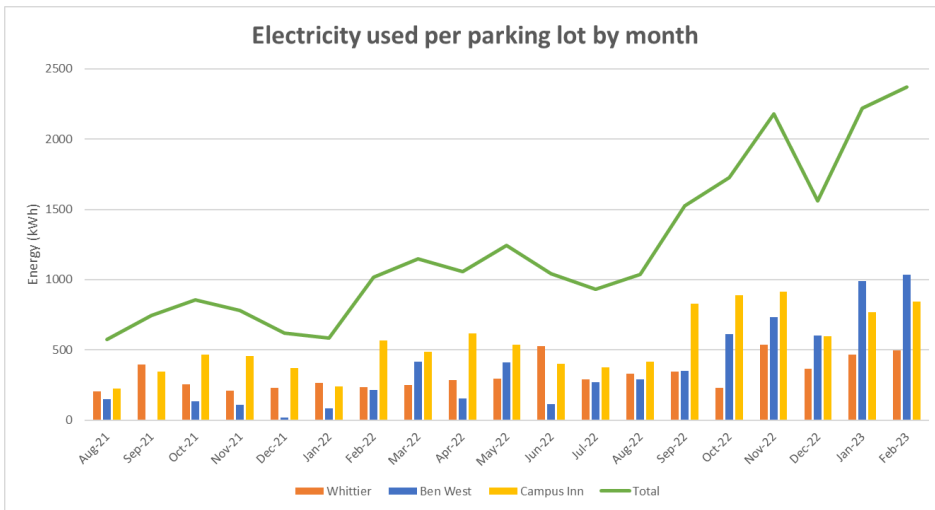
Outcomes

Characterizing EV chargers

In partnership with departments and offices, including Facilities and OneCard, Ryan was able to find and document the College's existing charger models, their installation history, and several metrics on current and potential usage. Through the data collected, Ryan determined that it costs the College about \$2.50 per person to provide free charging for each 4-hour charging period, and only 0.08% of the College's annual energy was used for EV charging in 2022. In general, we find that current charging infrastructure currently does not have an appreciable impact on electrical infrastructure.

EV charger usage data

Ryan determined EV charger usage through anonymized OneCard swipe data (user focused) and electricity usage data (energy focused). In analyzing the data, he found a very clear upward trend in EV charger usage over the past two years, despite having a fixed number of charging ports, as illustrated in the figure below.



This bar chart shows electricity usage per parking lot (Whittier, Ben West, Campus Inn, and totals) from the period between August 2021 to February 2023. The trend is of increasing usage, particularly in the last six months.

Identifying methods of projecting EV adoption

Through peer institution outreach, Ryan developed a research process and a timeline for finding an EV adoption forecast specific to Swarthmore’s campus, which involves counting our current EV user base and extracting projection estimates from a larger area. The 2023 Swarthmore College Commuting Survey found that approximately 5% of College staff members commute with an EV, and the results show substantial interest from staff members in adopting an EV in the future. Additionally, Ryan, with the help of Sierra Spencer ’18, identified a model that would forecast EV adoption at the county level and collected the necessary historic county-level data needed to complete the forecast.

Future Work and Recommendations

This project successfully deepened the College’s institutional understanding of its EV landscape. Future work on EV adoption at Swarthmore should build off of Ryan’s work, closely following the process flowchart. It’s recommended that future work in this area focus on:

- Completing the county-level projection model to forecast EV adoption for Delaware County
- Conducting outreach to peer institutions to determine our own infrastructure needs based on projection estimates
- Developing a formal system of compiling EV charger data for stakeholders to review EV charging infrastructure
- Holding discussions with stakeholders and staff members on their EV habits and response to EV incentives



SENIOR PRESIDENT'S SUSTAINABILITY RESEARCH FELLOWSHIP

This year, the PSRF program supported five previous PSRF fellows to return as senior fellows and advance campus sustainability. This year's cohort of senior fellows worked on a wide range of sustainability projects, from food systems work to research on embodied carbon.



ALICE DU '24, SHE/HER

Embodied Carbon: This fall, Alice worked with Project Manager Roderick Wolfson and Climate Action Manager Hannah Ulloa to research and propose strategies to reduce embodied carbon, the carbon emissions associated with the construction and demolition of buildings.



JORGE LOPEZ NAVA '23, HE/HIM

Sustainability Tracking: This year, Jorge worked with Sustainability and Engaged Scholarship Fellow Alex Flowers '21 to complete the [2023 Sustainability Tracking Assessment and Rating System](#) (STARS) report. Through extensive collaboration with stakeholders from across the College to gather the needed information, Swarthmore achieved a “gold” rating from [AASHE](#), the organization behind STARS, for the first time in its history! This means that Swarthmore achieved more than 65% of total available points for the four sustainability categories.



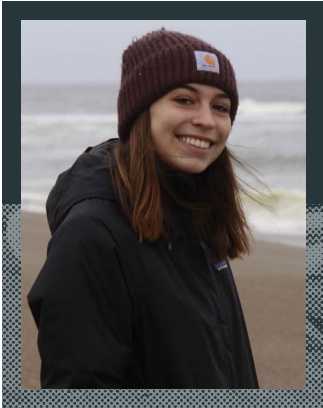
OLIVIA FEY '23, SHE/HER

To Zero by Thirty Five Engagement: This year, Olivia worked with Climate Action Manager Hannah Ulloa to conduct extensive campus engagement around the To Zero by Thirty Five energy plan. Olivia conducted surveys, tabled at campus events, and held several informational plant giveaways to inform the campus community about this important initiative and answer questions.



OLIVIA STOETZER '23, SHE/HER

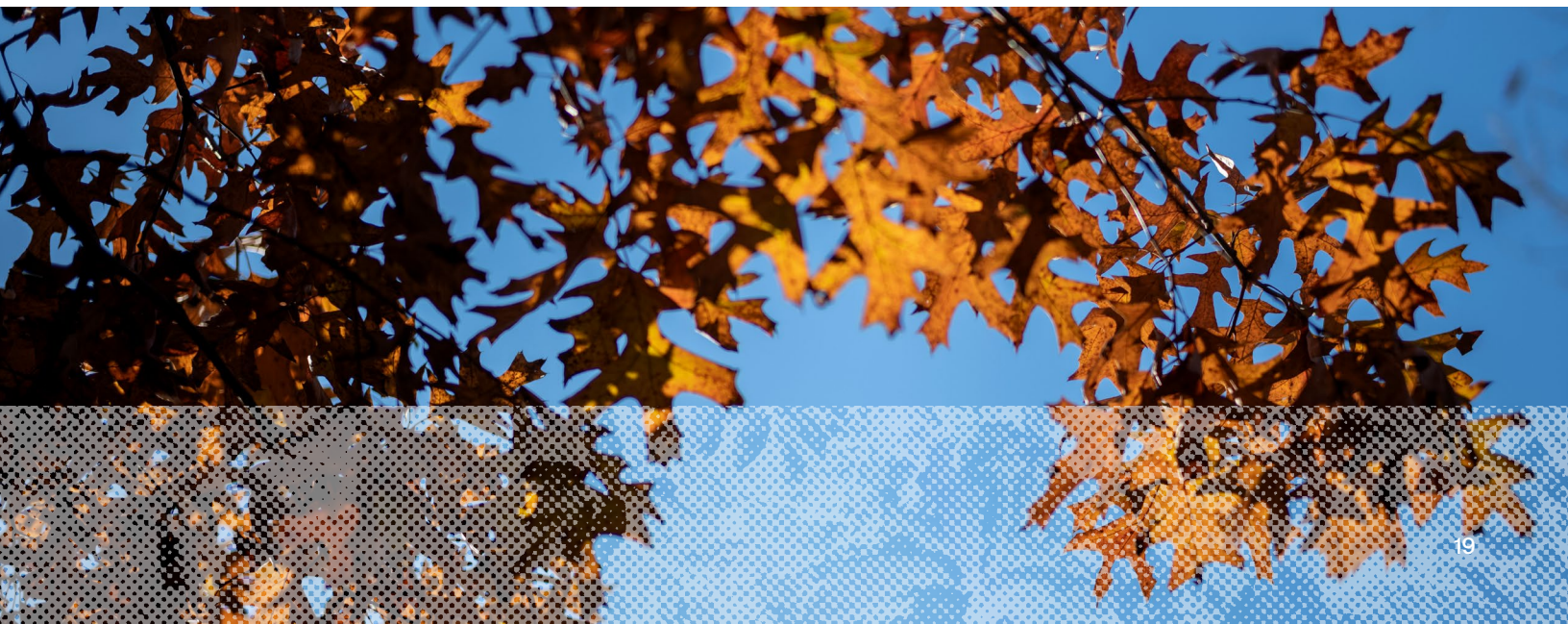
Greenhouse Gas Tracking: This year, Olivia worked with Climate Action Manager Hannah Ulloa to complete Swarthmore's annual greenhouse gas report. Olivia collected data from campus stakeholders and conducted data analysis to complete the report.



MAYA TIPTON '24, SHE/HER

SOPHIA SCHLENZ '24, SHE/HER

Food Systems: This spring, Maya and Sophia worked with Associate Director of Sustainability Clare Hyre to create lesson plans for community engagement in food growing spaces, host a speaker panel, and facilitate planting and work days to beautify and upkeep the Garden Collective space. The Garden Collective, adjacent to the Women's Resource Center and Our Food Garden, is a community area intended to increase student engagement with food systems and serve the campus community.



SWARTHMORE

QUESTIONS? COMMENTS?

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