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## Preface

The University of Richmond should commit to achieving the **Gold Standard** rating by the AASHE Campus Sustainability Index, by 2024. *Gold Standard for Green Spiders* includes eight proposals that taken together, will move UR up from our current silver rating to gold. This volume also includes short summaries of the sustainability programs of eight of the top ten most sustainable liberal arts colleges in the nation. The eight student authors of these chapters completed their works as part of the Environmental Studies Senior Seminar course, the capstone course for Environmental Studies majors. Below, I provide a brief background for this project.

### *Sustainability at the University of Richmond: Recent History*

At least since the year 2000, successive administrations of the University of Richmond have laid a solid foundation for achieving excellence in sustainability as an institution. In 2003, then-President Cooper signed the [Tallories Declaration](#) on sustainability. The commitments made in this declaration include working for environmental literacy for all in the university community, and creating a culture of sustainability. Cooper's successor, President Ayers, signed the [American College & University Presidents Climate Commitment](#) (ACUPCC). Building on the Tallories Declaration, this committed us to making sustainability part of the educational experience for *all* our students. It also obligated UR to make a plan with explicit targets to reach climate neutrality, and to set specific target dates. In order to meet these commitments, UR established an Office of Sustainability, with a full-time, dedicated Director of Sustainability. The UR Steam Plant converted from coal to natural gas, eliminating the black coal smoke that used to rise from the brick smokestack. The Office of Sustainability led the development of the [2010 action plan](#) to meet the commitments of the ACUPCC. The plan included a pledge to reduce carbon emissions by 30% by 2020 (relative to 2009) and to reach carbon neutrality by 2050. We also pledged that all new buildings on campus would meet at least the Silver rating for sustainability according the [LEED](#) rating system.

Our current President, Ronald Crutcher, has continued the tradition. In 2015, he signed UR to the [American Campus Climate Pledge](#), supporting US commitment to the Paris Climate agreement, and in 2017, he made UR a signatory to the "[We are still in](#)" declaration of continued support for the Paris Climate Agreement. Finally, in the 2016-17 academic year, President Crutcher led UR in creating a new master [strategic plan](#), which commits UR to "Complete and implement a Sustainability Strategic Plan to further weave responsible environmental stewardship into the fabric of the University."

### *Sustainability Now: Where Do We Stand?*

This solid foundation is an excellent start; however, it does not guarantee excellent achievements. To be truly excellent in sustainability, we must set ambitious goals. The goals must be specific, and measurable by widely accepted standards. And we must declare these goals publicly, to allow the entire University of Richmond community to participate in holding ourselves accountable to our commitment to excellence. The Association for the Advancement

of Sustainability in Higher Education (AASHE) provides the framework for just this kind of goal. They developed the [STARS](#) system for measuring the sustainability of college and university campuses. It is the most widely accepted system, and UR already uses it. UR is currently in the middle of the [silver rating](#). We urge the University to commit to reaching the gold standard rating by 2024, as part of the Sustainability Strategic Plan.

Currently, well over 100 institutions have met the gold standard rating (see page 77 of the [AASHE Campus Sustainability Index 2017](#)). They range from small private liberal arts colleges to large public state universities. They include very wealthy schools, and schools with very modest endowments. Of the 10 schools that our Office of Admissions lists as our [top competitors for admissions](#), half of them have already achieved the gold standard, including our very top competitor; the University of Virginia. Similarly, almost half of the national liberal arts colleges that rank above UR on the [US News and World Report ranking](#) have achieved the gold standard. If the University of Richmond wishes to advance in our competition for the best students, we must strive for excellence in *everything* we do – we cannot exempt environmental sustainability as a category where being second-tier is “good enough.”

A commitment to excellence in sustainability is more than just being “good for goodness’ sake.” The [UN Global Compact - Accenture CEO Study](#) found that 97% of CEOs believe sustainability will be important to the future success of their business. An article in [Harvard Business Review](#) finds “...sustainability is a mother lode of organizational and technological innovations that yield both bottom-line and top-line returns. Becoming environment-friendly lowers costs because companies end up reducing the inputs they use. In addition, the process generates additional revenues from better products or enables companies to create new businesses. In fact, because those are the goals of corporate innovation, we find that smart companies now treat sustainability as innovation’s new frontier.” [PwC](#) found that three quarters of CEOs say their companies are developing new products and services to respond to climate change – and a third say it’s helping them grow their business. PwC states: “Sustainability is fast becoming the lens through which a business is judged by its customers, workforce, society, governments and even its investors.” Universities and colleges will also be seen –and judged– through that lens. If we are to continue our climb up the ranks of the nation’s best liberal arts colleges, we must commit to achieving true excellence in sustainability; excellence that is recognized as meeting the Gold standard.

### *Silver to Gold: How to Get There*

A commitment to reaching the Gold standard by 2024 is the first step in reaching true excellence in sustainability. The next steps are to develop specific proposals – initiatives in the Sustainability Strategic Plan. The proposals in this volume are written as initiatives. The student authors of these proposals recognize that universities are complicated enterprises, and developing initiatives is exceptionally difficult. They do not expect their proposals to be simply adopted as initiatives. Rather, they hope that these proposals may *inspire* those who will write the strategic plan to be ambitious; to plan for excellence.

The students began by studying the best of the small liberal arts colleges, according to the [AASHE Campus Sustainability Index](#) (see page 71). The results of their studies are summarized in Chapter 9. These studies inspired and informed their proposals. The proposals range across all sectors of the university. Most of the proposals note specific components of the AASHE STARS rating system where their proposals would boost UR's score.

Some proposals focus on curricular issues. [Jablin](#) proposes a sustainability service requirement as part of our general education curriculum. While that seems to be a high challenge, she notes that other colleges have established similar requirements. We should also note that UR signed the ACUPCC, pledging to make sustainability a part of the educational experience for *all* our students. [Egner](#) proposes a new degree, a minor in sustainability. Faculty in the Environmental Studies Program are also interested in this idea, and we note that the degree may be particularly attractive to students majoring in Business School degrees.

Other proposals focus on university operations. [Jones](#) offers a Green Dining proposal that would substantially reduce wastes produced by our dining facility. Note, UR recently had to retreat from our commitment to reduce our trash shipments to landfills by 80% by 2020 – our new goal is 75% reduction by 2025. [Jaromin](#) suggests we expand our use of solar, and experiment with a different model of using solar power to explore which model will be best in the uncertain future. [James](#) advocates for a thrift store on campus, both to reduce wastes and to help meet Tallories pledge to create a culture of sustainability on campus.

Still other proposals are remarkable for how they cut across the different sectors of the University. [Psarakis](#) proposes that UR adopt a biodiversity management program. In addition to our heavily built 345 acre main campus, UR also owns two off-campus parcels of undeveloped land, each in excess of 100 acres. Inexpensive management options for biodiversity (operations) would also provide numerous opportunities for individual and course-based research projects (curriculum). [Bal](#)'s proposal for UR to establish a presence on the James River, and [Hingst](#)'s proposal to greatly expand the UR community gardens are similarly remarkable for the way they would impact all sectors of the university.

### *Acknowledgments*

We would like to express our gratitude to the staff of the University of Richmond for helping us develop these proposals. In particular, we thank Rob Andrejewski, Director of Sustainability; Alison Moyer, Landscape Manager; and Alison Smith, Director of Financial Planning & Budget. We are also grateful to Ben Stanley, President of Shockoe Solar; and Rohit Fenn, Research Assistant at Sterling College for their help.

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# Chapter 1



## A Campus Sustainability Service Program in the General Education Curriculum

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# Chapter 1

## A Campus Sustainability Service Program in the General Education Curriculum

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### **Abstract**

This paper describes a proposal for the addition of a sustainability-based community service requirement to the general education curriculum to encourage systemic involvement in on-campus sustainability projects. Current support for the University of Richmond's goal to integrate sustainability across various University functions is limited and this paper outlines the Campus Sustainability Service (CSS) program as an option for addressing the issue to ensure the success of the UR Sustainability Strategic Plan. It presents a framework for the CSS program and a strategy for piloting the initiative that can support phasing in a complete version of the program over time. The paper also discusses how this proposal benefits the University and its students, staff, and faculty, emphasizing impacts on the school's performance as an AASHE member, campus well-being, and student life outside of campus.

### **Introduction**

The growth of sustainability initiatives across campuses in the United States today pushes higher education institutions to establish environmental policies, implement action plans, and redesign course structures (Arroyo, 2017). Though there are numerous models and frameworks to facilitate an institutional shift towards adopting sustainability initiatives, studies suggest that a successful transition to sustainability is dependent on a systemic approach. A successful sustainability transition plan requires involvement from every group affiliated with the university: students, staff, and faculty, and even the local community (Blanco-Portela et al., 2017; Ferrer-Balas et al., 2010). At the University of Richmond (UR), there is evidence of some systemic involvement towards reaching the school's goal of integrating sustainability across campus departments and operations ("Get Involved", n.d.). Table 1 lists examples of current UR programs designed to encourage involvement from various University groups in supporting the school's sustainability initiative.

**Table 1. Current UR Programs that Encourage Campus Involvement in the University’s Sustainability Initiative**

<b>Program Name</b>	<b>University Group Program Applies To</b>	<b>Current Number of Participants</b>	<b>Program Description</b>
River City Project	Faculty	23	Provides faculty with essential development resources to revise and “link their courses to the unique geographical and environmental features of Richmond and Virginia” (“River City Project”, n.d.).
The Environmental Stewardship in a Changing World FLC	Faculty	16 <sup>1</sup>	A faculty learning community (FLC) focused on responding to the “Stewardship in a Changing World” goal of UR’s strategic plan. <sup>2</sup> This FLC works to define environmental stewardship and develop strategies to integrate it more extensively across the school (“Faculty Learning Communities”, n.d.).
University of Richmond Office Supply Exchange (UROSE)	Faculty and Staff	Not recorded	A student-run office supply exchange program where UR offices are encouraged to donate extra supplies and in return, can shop the surplus supply inventory. In Fall 2017, the program saved UR offices more than \$200 every week (“UROSE”, n.d.).
University of Richmond Sustainability Advocates	Students	5 to 20 per event	A peer education program encouraging a sustainability focused community through weekly activities (documentary screenings, volunteering, professional sustainability presentations, etc.) for students to attend to expand sustainability knowledge and interact with other, equally passionate students (“URSA”, n.d.).
Green Room Program	Students	129	A certification program encouraging students to reflect on and adopt sustainable living habits to become green room certified. Students must respond positively to 15 out of 29 checklist items for their room, suite, or apartment to qualify as a certified green room (“Green Room Program”, n.d.).

<sup>1</sup> Many faculty members participating in the FLC also are participants of the River City Project.

<sup>2</sup> Faculty learning communities (FLC) are an opportunity for faculty members to meet, collaborate, and develop projects that not only support UR’s mission, but benefit the University, City of Richmond, and greater global community. FLCs are not limited to the topic of environmental stewardship and exist for a variety of different focuses to support faculty from UR’s five different schools (“Faculty Learning Communities”, n.d.).



Though Table 1 does not list all implemented UR initiatives intended to encourage campus involvement, it does represent most programs that support a systemic approach for integrating sustainability more deeply across campus. Of concern is the small number of individuals participating in these voluntary programs, limiting the success of the sustainability initiative. This limited support highlights the possibility that the effectiveness of the new Sustainability Strategic Plan will be hindered by a similar lack of systemic involvement unless the plan accounts for such a challenge. This paper presents a solution to the school's lack of systemic involvement and outlines a proposal for a Campus Sustainability Service (CSS) program that increases involvement in UR's Sustainability Strategic Plan from students, staff, and faculty through a mandatory community service component of the undergraduate curriculum.

## **Campus Sustainability Service Program Overview**

The Campus Sustainability Service (CSS) program encourages systemic involvement that promotes the Sustainability Strategic Plan by requiring all undergraduate students to participate in on-campus community service that works to invigorate the school's sustainability efforts. This paper proposes the CSS program be added to UR's current required general education curriculum. The program requires a weekly three-hour service commitment from students for three consecutive weeks followed by a one-hour commitment for reorientation during a fourth week, resulting in a total time commitment of 10 hours over each student's UR career. Though a student-focused program, the CSS initiative relies on staff and faculty to function.

Staff are responsible for leading a campus service project for a group of 5-15 students throughout the course of the three service weeks. Ideally, staff in this leadership position guide and educate students about a service project related to their current work that benefits the school's overall sustainability practices. This allows staff members to complete their daily work with student assistance, advancing progress of the project. Table 2 includes service project ideas for the CSS program to begin with. The pilot projects described in Table 2 are certainly not all-encompassing and require appropriate staff training and, in some cases, infrastructure before implementation. These projects, however, create a strong foundation for increasing staff and student involvement in UR's sustainability initiative. Though these projects require physical work, some tasks, such as those associated with the dining hall food waste sort station, can be performed sitting down with minimal movement, ensuring that students who are physically restricted can still participate in the program.

**Table 2. Possible On-Campus CSS Projects**

Project Focus	Size of Student Group at Project	Potential Staff to Run the Project	Tasks Students Perform
Landscaping	15	UR Landscaping Staff	Daily landscaping tasks, such as emptying outdoor trash cans, spreading pine straw and hardwood mulch, planting native annual flowers, watering campus plants, and weeding (Moyer, 2018). Students also assist with surveying efforts for the proposed biodiversity management plan (see Psarakis 2018, chapter 5 of this document).
Gardening	5	-UR Landscaping Staff -Hired Staff for the Proposed Community Garden Plan (see Hingst 2018, chapter 4 of this document)	Assisting with maintenance of the proposed expansion of the on-campus garden (see Hingst 2018, chapter 4 of this document). Students are responsible for planting of crops, watering, pruning, staking, weeding, and harvesting.
Campus Building Waste Audits	10	UR Custodial Staff	Help conduct waste audits of campus buildings by pre-weighing waste, properly sorting waste, then re-weighing the waste to determine the performance of waste disposal in each building on campus.
Dining Hall Food Waste Sort Station <sup>3</sup>	5	Office for Sustainability Interns <sup>4</sup>	Before dining hall customers place their plates on the dish rack, students help the individual sort their food waste into either the landfill, recycling, or compost bin while educating them about the impacts of food waste.

<sup>3</sup> This project requires UR to set up a food waste sort station in the dining hall. To keep the waste sorting process efficient, there could be three bins each placed on top of a weighing scale so that as waste is added, consumers can see the amount of current food waste. Three bins are proposed to provide waste disposal for landfill, recycling, and compost. UR currently does not compost, so the school would have to start working with a compost vendor.

<sup>4</sup> Though Office for Sustainability interns are not specifically UR staff, working at the food waste sort station aligns with the current Rethink Waste Campaign that the interns and Rob Andrejewski are heavily promoting, making this task relevant to their current work. The Rethink Waste Campaign is a movement established to help UR reach its goal of 75 percent waste diversion by 2025 by encouraging conscious waste disposal across campus (“Rethink Waste”).

To further a systemic approach towards reaching UR's sustainability goal, the CSS program calls for faculty involvement after a student's completion of the service commitment, or during the fourth week of the program. This final reorientation week involves a faculty member meeting with a student completing the program to help them reflect on their service through an informal, verbal discussion. Research indicates that reflection after community service helps students process experiences and can contribute to positively changing one's mindset and behavior (Richard et al., 2016). The reflective component of the CSS program therefore encourages students to consider their service experience and gain meaning and knowledge about sustainability from the program. The reorientation piece of the CSS program is also a valuable tool for educating faculty members about current sustainability initiatives through student perspectives and encourages faculty members to personally reflect on sustainability at UR and on a global scale. While the increased involvement of students, staff, and faculty through both the service and reorientation portions of the CSS program will likely benefit the Sustainability Strategic Plan, the systemic approach associated with this proposal requires time to become fully active due to the logistical demands of the program.

## **Piloting and Phasing in the Campus Sustainability Service Program**

### *Benefits of Piloting and Phasing in*

Implementation of the CSS program would be particularly demanding because this proposal requires the involvement of all undergraduate students along with many staff and faculty members. There are currently 2,999 undergraduate students enrolled at the University and establishing a CSS program that immediately can accommodate the entire student population would be challenging ("About the University", n.d.). For this reason, it is recommended that the University first pilot the CSS program with a smaller portion of the student population, then phase the program in.

Piloting of the program not only helps gauge its long-term prospects, it creates the opportunity for the campus community to adjust before large-scale implementation. Figure 1 on the title page shows current UR students completing community service off-campus and highlights the existence of students who already participate in service and can easily transition to the expectations of the CSS program. However, because the CSS program involves changing University expectations for students, staff, and faculty, it is likely that the program would also initially receive some resistance from individuals who are content with the current system and see no reason for change. Research suggests that successfully implementing initiatives involving change in a university is dependent upon how the initiative is introduced into the institution. Introducing the initiative to small groups of individuals first, then increasing the magnitude of the change (if the initiative is successful) is recommended over immediately introducing change to a large group of people, who if resistant to the change, will be hard to address (Elton, 2003). By piloting the CSS program with a small part of the student population, UR avoids large scale resistance that can damage a reputation and allows for small scale resistance that will eventually

die down or can be resolved through communication with students, staff, and faculty. If the pilot program is successful, gradual expansion of the CSS program will allow the University community to slowly adapt to and accept the change in expectations as the CSS initiative is completely phased in.

Piloting the CSS program also allows for problems to occur with the program itself. Researchers note that some initial issues normally arise when increasing sustainability-based efforts at the university level, including structural conflicts, miscommunication, and negative behavior (Lozano, 2006). Testing the CSS program on a small-scale creates an opportunity for these or other issues to occur, but at lower social and productivity costs to the school. If an issue arises, the University can effectively address it by altering the requirements of the program or through adjusting on-campus service projects that the program supports. The proposed CSS program has the structural flexibility to evolve to meet the needs of and satisfy the campus community and will likely require change to accommodate for unforeseeable issues that will inherently occur. The flexibility of this proposal also allows the University to receive feedback from participants in the pilot program and respond with the appropriate changes, further promoting the success of the program.

#### *Logistics of Piloting and Phasing in*

When completely phased into the general education curriculum and campus community, the CSS program must support about 3,000 students through the help of approximately 638 faculty members and 643 eligible staff members (IFX Official Census Admissions Files, 2016).<sup>5</sup> To meet this requirement, this paper proposes a year-long pilot program with 210 student participants, followed by a three-year phase-in program. Because the CSS program only requires a four-week commitment from students, the program can repeat with a new group of student participants multiple times a semester. As demonstrated in Figure 2, which assumes the academic calendar schedule for the fall semester of 2018, the first cycle of the CSS program could start on September 3, during the second week of classes, and continue until the end of the month. The second cycle could then start on October 1 and end November 3, and the last cycle could occur from November 5 to December 7. The sample schedule also accounts for weeks that the program would not operate, or be on “break,” due to school holidays or exam schedules disrupting part of the weekly schedule. A similar schedule of three CSS program cycles could be adopted in the spring semester, resulting in a total of six cycles of the program during the pilot year. Assuming the pilot program implements the four projects described in Table 2, a total of 35 students from the first year class can participate in each cycle. With six cycles, this allows for all 210 student participants to partake in the program during the pilot year.

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<sup>5</sup> The total number of staff is 1,241, which represents the number of professional and service/support staff working at the University. Since professional staff (engineers, healthcare practitioners, librarians, etc.) likely have stricter schedules, these staff members were removed from the pool of potential staff participants in the CSS program. As a result, the 643 “eligible” staff members only represents the number of service/support staff on campus.

**Figure 2. Fall 2018 Sample Semester Schedule with the CSS Program<sup>6</sup>**

September						
Su	Mo	Tu	We	Th	Fr	Sa
26	27	28	29	30	31	1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30						

October						
Su	Mo	Tu	We	Th	Fr	Sa
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

November						
Su	Mo	Tu	We	Th	Fr	Sa
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	

December						
Su	Mo	Tu	We	Th	Fr	Sa
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

- Service Commitment
- Reorientation Session
- Program Break (due to School)

- 27** First Day of Classes
- 7** Last Day of Classes

To promote faculty and staff participation, members from these campus groups also change with each new pilot program cycle. At the end of a cycle, each staff member meets with their respective incoming replacement member to appropriately transition and prepare the individual to successfully lead the next program cycle. Similarly, outgoing faculty members transition incoming faculty members to ensure the continued success of the reorientation segment of the program. During each cycle, service for each of the four different projects occurs

<sup>6</sup> This figure was produced using information provided by the University of Richmond Registrar’s Office (University of Richmond Registrar’s Office, n.d.).

at the same time and on the same day of the week with student participants attending the same project every week. Figure 3 provides an example schedule of one week of a cycle. If this schedule were adopted for a cycle, all three service weeks would follow this same schedule. Days of the week that each service project occurs are arbitrarily assigned, while project times are determined based on staff and student schedules. The duration of the project, however, is consistently three hours so that students meet the required weekly three-hour service commitment.

**Figure 3. Sample Weekly Project Schedule**

Monday	Tuesday	Wednesday	Thursday	Friday
Landscaping Project 1:00 – 4:00 pm	Gardening Project 12:00 – 3:00 pm	Waste Audit Project 10:30 am-1:30 pm	Dining Hall Food Waste Sort Station Project 12:00 – 3:00 pm	No Project Running

Since only 35 students participate in each CSS cycle of the pilot program, only four different projects are necessary for a cycle to run. And, with one staff member leading each project, this means that there are four staff participants for each cycle, resulting in a total of 24 staff members participating in the pilot program.<sup>7</sup> During each reorientation week of the pilot program, faculty members meet with one student at a convenient time for the required one-hour time commitment. Therefore, 35 faculty members participate in each cycle of the pilot program, contributing to a total of 210 faculty member participants during the pilot year. As evidenced by the number of staff and faculty participants in the pilot program, the first year of the CSS program does not require commitments from all staff and faculty members, reinforcing the idea that building a systemic approach through this proposal is a gradual process. A lottery system is used to choose staff and faculty members to participate in the pilot program, requiring chosen individuals to participate.

Similarly, a lottery system is used to choose student participants for the pilot program, but under different conditions. The student participant group size of 210 individuals is intentionally a little larger than a quarter of the incoming expected first year class size, which was 801 students in fall 2017 (“Student Profile”, n.d.). To set up a pilot program that can easily transition to the phase-in segment of this proposal, the 210 student participants of the pilot program are randomly chosen from only the incoming first year class. If the pilot program is successful and the University decides to completely phase in the CSS program, the following year will be the first year of the phase-in segment and involves randomly selecting 210 student

<sup>7</sup> There are six CSS cycles in the pilot program and if four different staff members participate in each cycle, this will contribute overall to 24 staff participants.

participants from the now sophomore class in addition to 210 participants from the new incoming first year class for a total of 420 student participants in the program. The second year of the phase-in segment of this proposal maintains this lottery-based selection process of 210 students from the first year class and 210 students from the sophomore class, but expands to accommodate 210 additional student participants randomly selected from the junior class for a total of 630 participants in the program. During the third and final year of the phase-in segment, 210 randomly selected students from the senior class are added to the program, expanding the number of student participants to 840 individuals.

Gradually expanding the CSS program in this manner ensures that all students who were first year students when the pilot program began can participate in the CSS initiative by the time they graduate.<sup>8</sup> The design of the phase-in segment of this proposal also allows class years that come after this first year class to participate in the program during their four years at UR, supporting complete implementation of the CSS program. Through allowing 210 student participants from each class year to complete the program a year, the fully implemented CSS program must only support 840 undergraduate students every year. To account for the increase from the 210 student participants in the pilot program, the structure of the CSS program can grow to include either projects that can support a larger number of student participants or more projects offered every day of the week. Figure 4 provides an example schedule that could be implemented if the University offered multiple projects a day. Because student participants are required to attend the same project at the same time every week, this sample schedule could support up to 140 participants for a cycle, leading to 840 student participants over the course of six cycles in a year. The number of faculty and staff participants could also increase to meet the expanded demands of the fully implemented program.

**Figure 4. Sample Weekly Project Schedule Under Full Implementation of CSS Program**

Monday	Tuesday	Wednesday	Thursday	Friday
Landscaping Project 11:00 am– 2:00 pm	Gardening Project 12:00 – 3:00 pm	Waste Audit Project 11:00 am– 2:00 pm	Dining Hall Food Waste Sort Station Project 11:00 am– 2:00 pm	Landscaping Project 11:00 am– 2:00 pm
Dining Hall Food Waste Sort Station Project 12:00 – 3:00 pm	Landscaping Project 12:00 – 3:00 pm	Landscaping Project 12:00 – 3:00 pm	Gardening Project 12:00 – 3:00 pm	Dining Hall Food Waste Sort Station Project 11:30 am– 2:30 pm
Waste Audit Project 1:00 – 4:00 pm	Waste Audit Project 1:30 – 4:30 pm	Gardening Project 12:00 – 3:00 pm	Landscaping Project 1:00 – 4:00 pm	Gardening Project 1:30 – 4:30 pm

<sup>8</sup> Though UR class sizes tend to be smaller than 840 students, this proposed number allows for flexibility of future class sizes.

The fully implemented CSS initiative requires a more complicated structure, but the phase-in segment of this proposal creates an easier transition to the complete program, which largely increases student, staff, and faculty involvement in UR's sustainability initiative and provides multiple benefits.

## **Campus Sustainability Service Program Benefits**

One of the main benefits of implementing the CSS program is the impact of the initiative on UR's overall performance in sustainability. In the 2017 Sustainable Campus Index compiled by AASHE, the University received a Silver STARS rating, indicating room for improvement in multiple sustainability areas (AASHE, 2017). The Campus & Community Engagement area is one such area that would benefit from the implementation of the CSS program. The most recent STARS rating the school received for Campus & Community Engagement was 27.1 out of 41 points. Since the CSS program requires faculty and staff members to transition each other and educate and guide students about projects, the initiative helps improve UR's chance of receiving the full three points for the sub-category Employee Educators Program. The sub-category titled Community Service would also greatly benefit from the CSS program, improving the school's ability to receive the full five points associated with this feature ("University of Richmond Sustainability Report", 2017). Given that UR already received some points towards these sub-categories of the Campus & Community Engagement section, implementation of the CSS program has the potential to bring the school's STARS rating up to 31.64 points. The improved STARS rating is a minimal increase however, the rating only represents the impact of introducing a community service component across campus.

As Table 3 demonstrates, the on-campus service projects that form the foundation of the CSS program create an opportunity for UR to earn more STARS points across different AASHE categories. Assuming the four projects listed in this proposal are used in the CSS program, the school could earn up to 15.32 additional STARS points. The sustainability-based service projects therefore have the potential to greatly benefit UR's STARS rating if the school opts for CSS projects that improve performance in AASHE areas in which the University currently underperforms. In addition to augmenting the University's overall sustainability performance, the CSS initiative also benefits the campus community and its members.



**Table 3. Project Impacts on UR STARS Rating<sup>9</sup>**

<b>Project Focus</b>	<b>AASHE Area Project Impacts</b>	<b>STARS Points UR Already Earned in Area</b>	<b>Additional STARS Points UR Can Earn in Area from Project</b>	<b>Sub-Categories Project Impacts to Improve STARS Rating</b>
Landscaping	Grounds	1.01 out of 4	2.99	<p><b>Landscape Management</b> Project creates extra help from student participants, allowing UR landscaping staff to dedicate more time and energy towards sustainable grounds keeping initiatives, such as a thorough invasive species management program.</p> <p><b>Biodiversity</b> Project helps with assessment of on-campus species and habitats (see Psarakis 2018, chapter 5 of this document).</p>
Gardening	Dining	1.13 out of 7	5.87	<p><b>Food and Beverage Purchasing</b> Project supports expansion of on-campus garden, which could supply the dining hall with produce to minimize non-local food purchasing (see Hingst 2018, chapter 4 of this document).</p> <p><b>Low Impact Dining</b> Campus garden produce in the dining hall could also be used to develop more plant-based meals (see Hingst 2018, chapter 4 of this document).</p>
Campus Building Waste Audits	Waste	3.45 out of 10	6.46	<p><b>Waste Minimization and Waste Diversion</b> Conducting waste audits for buildings across campus will help identify where specifically the school performs poorly with waste management so that the Office for Sustainability can direct more efforts towards improving waste management practices in these buildings.</p>

The systemic foundation of the CSS program encourages students, staff, and faculty to interact with one another outside of the classroom setting, creating a more cohesive campus community. Research shows a connection between social cohesiveness and happiness, suggesting that the community cohesion fostered by the CSS initiative could create a more encouraging campus environment to balance the stressful conditions often promoted by academics and work (Cloutier & Pfeiffer, 2015). Furthermore, many of the CSS projects proposed require physical activity, and such activity is shown to decrease stress levels in college students (Baghurst & Kelley, 2014). Through building a required service commitment with physical activity into the general education curriculum, this proposal therefore also builds in an academic break for students, which could greatly benefit them.

Not only does the CSS initiative promote a healthy campus community, it provides students with skills that are transferable to everyday life. Whether it be from landscape work, composting, or another activity at a project, participants can gain life skills to help them complete routine tasks, such as lawn care and appropriate waste disposal. Through experiential learning at service projects and from staff and faculty guidance, students are also exposed to environmental education. Studies on college campuses suggest a correlation between environmental education and environmentally-conscious behavior (Hsu, 2010; Zsoka et al., 2013). The CSS initiative can thus also encourage an environmentally-conscious mindset that is transferable to the larger community as students graduate and interact with new community networks.

On a larger scale, the CSS program is beneficial to the University as a competitor among other schools driven by sustainability initiatives. Currently, the University of Redlands in California appears as the only AASHE member that requires all undergraduate students to participate in a community service program (STARS, n.d.). With the Redlands community service program, students must complete either a community service activity course or a service-learning course taught by faculty members. The program includes a gardening and sustainability focus, but students can also explore other service fields, such as elementary education, through their community service experience (University of Redlands, n.d.). Though the faculty involvement and required service components of the Redlands program are relatable to the CSS initiative, the Redlands community service program remains different from the initiative proposed in this paper. Adopting this proposal would set the University of Richmond apart from other AASHE competitors and possibly make it a leader in the sustainability field and a unique attraction to prospective students.

## **Conclusion**

Altogether, the CSS program that this proposal outlines supports a systemic approach to achieving UR's sustainability initiative in the University's Sustainability Strategic Plan. The

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<sup>9</sup> This table was produced using information provided by the Office for Sustainability ("University of Richmond Sustainability Report", 2017).

pilot program presented creates a framework through which the University can experiment with the idea of the CSS program, highlighting an advantage of this proposal. When entirely implemented, the program's involvement of students, staff, and faculty through sustainability-based community service projects and reorientation sessions creates a campus-wide effort directed towards improving the University's performance in multiple areas, including dining, waste management, and grounds keeping. Ultimately, campus health and sustainability are features that everyone in the UR community enjoys and can contribute to through participation in the CSS initiative. Though the University currently encourages students, staff, and faculty members to help promote UR's sustainability efforts, a larger group of campus community members is necessary to accelerate the school's current sustainability performance. The CSS program could serve as such a catalyst, setting the University apart from other higher education leaders in sustainability while encouraging a healthier, more cohesive UR community that extends beyond campus.

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## Chapter 2



*Figure 1: Taken from (Patwary, 2016).*

## A Proposal for a Minor in Sustainability Quinn Egner

# Chapter 2

## A Proposal for a Minor in Sustainability

Quinn Egner  
Environmental Studies Major, 2018

### **Abstract**

It is nearly undeniable that humans are altering the earth and rapidly depleting natural resources, compromising the future of generations to come. Thus, the importance of sustainability and sustainable practices is becoming increasingly important and relevant. While the world is working to innovate and prioritize sustainability, it is important that the University of Richmond must do the same. This proposal is for the addition of a minor in sustainability added to the university's available education opportunities. The minor will be a total of six classes; three core sustainability classes and three additional classes to effectively cover the three pillars of sustainability (environmental, social, and economic sustainability). The minor would be beneficial to the University of Richmond in that it requires minimal costs of only two additional faculty members and would provide unquestionable benefits. A minor in sustainability would improve the university's AASHE STARS rating, allow the university to gain a competitive advantage among other institutions, and would allow the university to entice more prospective students and produce more competitive graduates that are global citizens. Furthermore, the university would be symbolizing that it understands the importance of sustainability by introducing this minor. Around the globe, businesses, communities, colleges, and individuals are taking the necessary steps to work towards a sustainable future. The University of Richmond, with the introduction of a sustainability minor, has the opportunity to help lead the way instead of falling behind.

### **Introduction**

Living in the Anthropocene, the world today is defined by how humans are rapidly changing the earth in an unsustainable way (Smith & Zeder, 2013). Because of the drastic altering of the planet and the unsustainable practices of today's population, humans are facing wicked problems for which the solutions are not easy nor clear. Universities have a vital and unique role to help societies move through these issues through educating the next generations (Hill & Wang, 2018).

Sustainability is most commonly defined using the UN World Commission on Environment and Development's definition: meeting the needs to the current generation without compromising the ability of future generations to meet their needs (United Nations, 2011). Generally, sustainability is divided into three pillars: environmental sustainability, social sustainability, and economic sustainability. The University of Richmond's strategic plan mirrors this language, as well (University of Richmond, 2017). Environmental sustainability describes

maintaining natural resources and minimizing human impact on the earth, allowing biological systems to remain diverse and function indefinitely. Social sustainability refers to building social support systems, communities, and political structures that foster human wellbeing and maintain social order. Economic sustainability describes the ability of an economy to produce a defined level of production indefinitely into the future (Blackburn, 2007).

The issue of creating a sustainable society and future has been receiving more attention lately. Many people, specifically young generations, are prioritizing sustainable thinking and addressing climate change (Hanks et al, 2008). Social sustainability is also gaining traction as the young generation works to fight for human rights, address social justice issues, and increases community building, among other initiatives. A survey of 26,000 young people aged 18-35 found that 45% of respondents listed climate change as the most serious issue globally, the largest response listed (Babington-Ashaye, 2016). Another survey of 5,000 people aged 18-25 found just how serious the young generation is about prioritizing sustainability: almost half of the respondents had used their purchasing power to buy from companies that focus on sustainability. Furthermore, over 30% of respondents said that they would boycott a business of company that did not take sustainability seriously (Masdar, 2016).

Businesses and CEOs are taking notice. According to a UN Accenture CEO survey, 97% of CEOs believe that considering sustainability and sustainable practices is vital to the future successes of their business (United Nations Global Compact, 2016). An article in the Harvard Business Review has found the drive of this sustainable thinking in business: “executives recognize a simple truth: Sustainability = Innovation” (Nidumolu et al, 2014).

The University of Richmond can address this growing interest in sustainability in society by adding a sustainability minor to its curriculum. The minor will entice more students to be interested in the university. As previously discussed, almost half of the current young generation uses their buying power to prioritize businesses and organizations with sustainability focuses. Adding a visible sustainability focus in the form of a minor for students will help put the University of Richmond on the sustainable map, making the university more enticing to the younger generation that highly values sustainability. Furthermore, the goal of the university is to produce well-rounded graduates who are able to find great careers. Clearly, surveyed businesses and companies are moving towards a focus on sustainability and are looking for employees with sustainability skills to help them achieve this goal. If the university matched that focus, graduates will be more competitive in the field and will be able to secure better jobs.

## **The Sustainability Minor**

### *Focus*

The sustainability minor will focus on the three pillars of sustainability as described by the United Nations: economic, social, and environmental sustainability. Environmental sustainability is weighted slightly more heavily as it is crucial to a basic understanding of sustainability. Furthermore, it is currently the most pressing issue concerning sustainability, as anthropogenic climate change promises disastrous consequences in the near future.

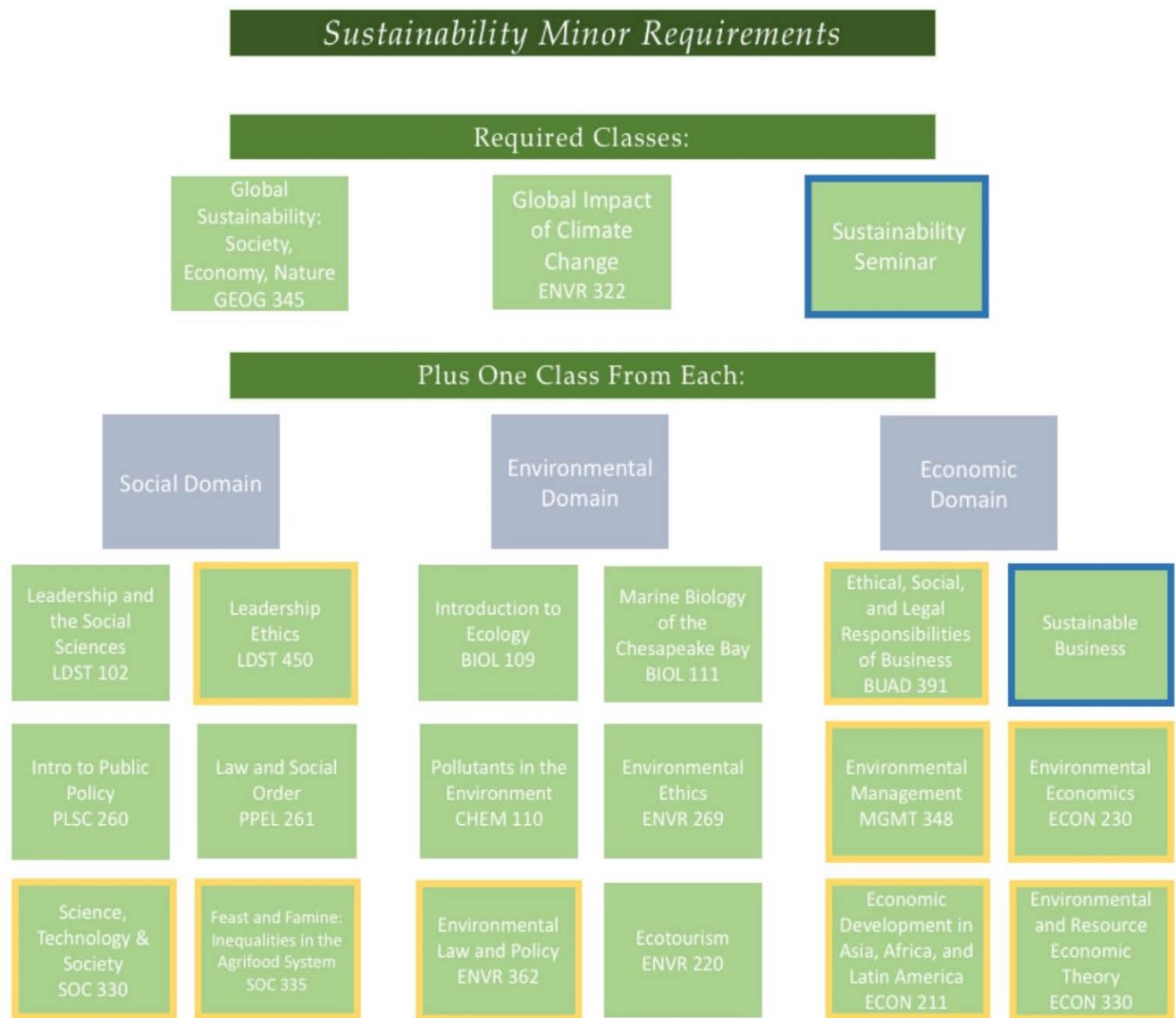


## *Classes*

The classes required for the minor are shown in Figure 2. Each sustainability minor will be required to take three classes as a basis and overview of sustainability and sustainable practices. These classes include Global Sustainability: Society, Economy, and Nature, Sustainability Seminar, and Global Impact of Climate Change. The sustainability minor will then have the option to choose classes to fulfil the remainder of the minor. Following the three pillars of sustainability, the minor may choose one of six classes in the social domain, one of six classes in the environmental domain, and one of six classes in the economic domain. This will complete the minor with a total of six classes. This is comparable to the curriculum of other sustainability majors and minors currently offered from other institutions, which focus on an interdisciplinary minor with an applied-knowledge component (Figure 3).

Every class listed for the sustainability minor is listed under University of Richmond's sustainability course index (Office of Sustainability –UR 2010). Courses listed as sustainable follow the STARS Academic Course Guidelines in that they integrate sustainability heavily into the curriculum and prepare students to apply sustainable thinking and practices into their professional and personal lives (Academic Course Criteria, 2017).

To make the sustainability minor accessible to all students and truly interdisciplinary, there is at least one option in every domain that does not require prerequisite classes outside of the minor. Any classes that require prerequisite classes that are not already covered by the minor are outlined in yellow.



Yellow borders indicate classes that require outside prerequisites. Blue borders indicate classes that will be created for the minor.

*Figure 2: Sustainability minor courses. Minors will take three core courses and three additional courses, one from each of the pillars.*

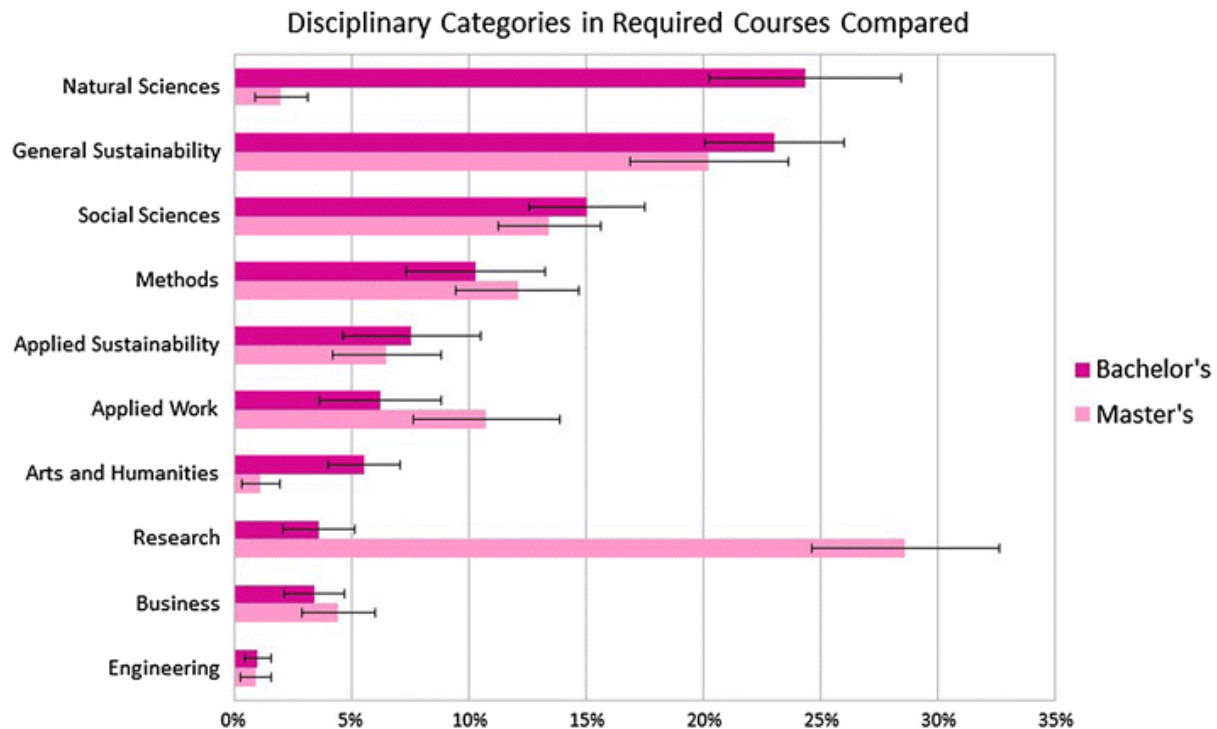


Figure 3: For many undergraduate sustainability degrees, a focus is placed on interdisciplinary studies and an applied component. The proposed minor in sustainability for the University of Richmond is similar to other institutions in this way. Taken from (O'Byrne, 2014).

While the University of Richmond offers many classes with sustainability themes, there are gaps that needed to be filled in order to create a comprehensive and successful minor. Classes shown in the graphic with blue borders are classes that would need to be added to the university in order to create a minor in sustainability. These classes require additional faculty involvement or faculty hiring. However, these classes are critical in developing a thorough and respected program.

*Sustainability Seminar:* This class is crucial to the sustainability minor. The class is similar to capstone classes in that the course is available to sustainability minors only in their final year of schooling. The class will reiterate the concept of sustainability under the three pillars in the first two weeks of the class. For the remainder of the class, students will work on individual or group projects with focuses on improving sustainability, whether that be for the University of Richmond campus, their hometowns, or an interesting case study. While other courses, especially Global Sustainability, may offer students an analysis of sustainability concepts and ideas, the Sustainability Seminar course is unique in its opportunity for sustainability students to engage with what they have learned and apply their knowledge through sustainable projects.

*Sustainable Business:* A sustainable business class is long overdue at the university and is also a critical class for the sustainable economy domain. As previously stated, it is important that the minor is available and accessible to all students. Thus, each domain must contain at least one class that does not require a prerequisite. The business, economics, and

management classes chosen for the domain all include sustainability focuses. However, they all require business school enrollment or extensive prerequisite requirements. Therefore, a broad sustainable business course should be added to the curriculum that requires no prerequisites. The sustainable business class will focus on sustainable growth for business, long-term planning, and environmental stewardship. The class will specifically cover topics of eco sustainability, human sustainability (ethics), and supply-chain sustainability.

### Crossover

The sustainability minor does share some common classes with the environmental studies minor (Figure 4).

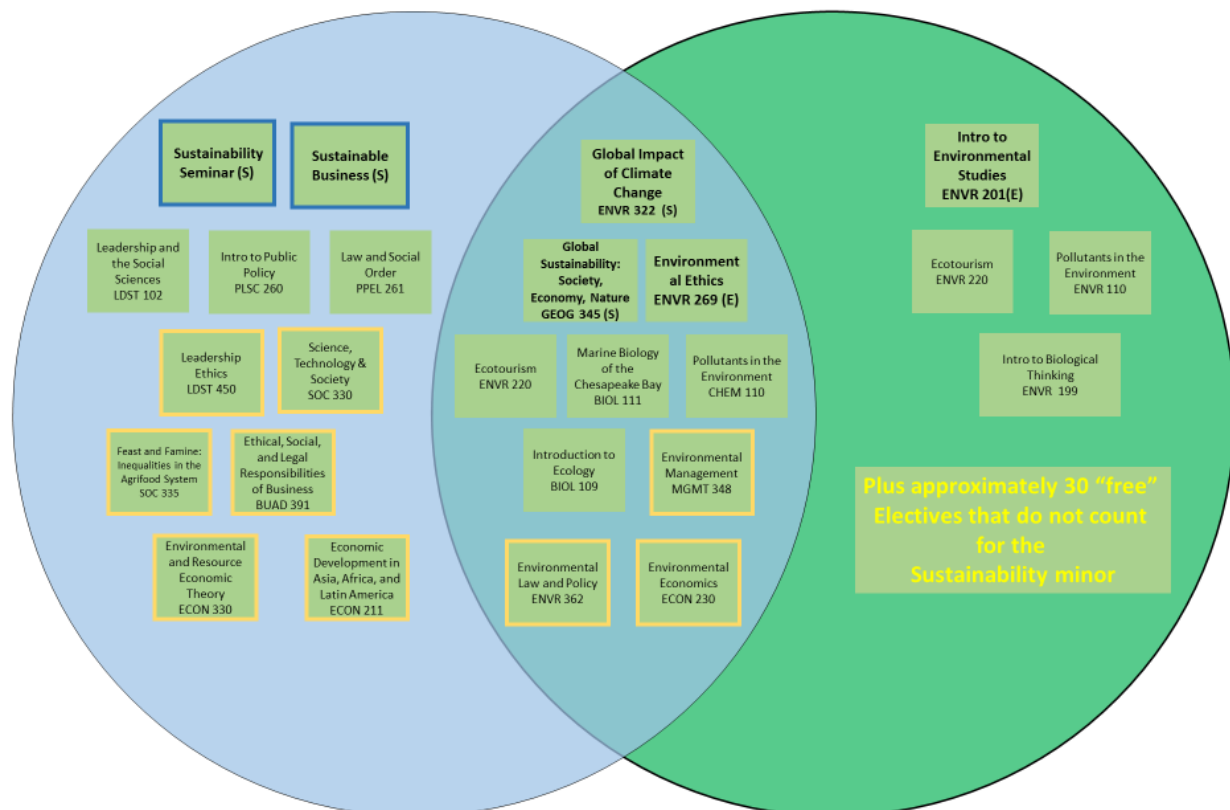


Figure 4: Courses offered for the Sustainability Minor in blue, courses offered for the Environmental Studies minor in green, and courses offered for both in teal. (S) denotes courses required for the Sustainability Minor, and (E) for courses required for the Environmental Studies Minor.

If already minoring in Environmental Studies, students might fulfill less than half of the requirements for a minor in sustainability. Environmental Studies compliments sustainability and does offer sustainability themes, leading to this slight cross-over of courses. However, the minors are sufficiently different enough to more than justify the addition of the sustainability minor. Furthermore, in many cases, such as in Notre Dame, the majority of students who choose to pursue a minor in sustainability come from non-sustainability related academic backgrounds (Hellman, 2018, pers. comm.). To that end, note many of the Business School courses with pre-requisites – the pre-requisites are also Business School courses.

## **Justification**

### *AASHE Score (STARS)*

The University of Richmond is currently rated silver by AAHSE STARS (AASHE, 2017). Out of 200 possible points in categories such as operations, engagement, and planning and administration, the University of Richmond has scored 113.18 (reported as 56.59 %). The University of Richmond works hard to be a sustainable school, but there is a significant opportunity for improvement, as evidenced by the university's STARS rating. Striving towards a higher STARS rating will help the university stand out to prospective students and will give the community a source of pride in the university's sustainability accomplishments.

Adding a sustainability minor will help the University of Richmond increase its STARS rating considerably. In the STARS rating system is a category for sustainability curriculum, valued at 37 points (AASHE, 2017). Currently, the university has 16.77 points, less than half of the total points available. Focusing on improving out STARS rating is easy low-hanging fruit, as adding a sustainability minor will help the university raise its score in curriculum, the largest subcategory in terms of points in the STARS rating system, signifying its importance.

As previously stated, the university currently holds 16.77 points out of the total 37 possible points in curriculum. However, in reality the university does not actually have those 16.77 points. In the curriculum category, there are points awarded for sustainability-themed academic courses which are worth 14 points. The University of Richmond listed and counted many sustainability courses in the self-reporting STARS system that are not currently offered, such as ENVR 321 Land Use Law and ENVR 325 Global Sustainability. It is difficult to know exactly how many courses offered at the university contain sustainability themes. While the university reported 33 total courses that involve sustainability, the actual number of continuously offered courses at the university may be closer to 25, currently. Even with a slightly inaccurate representation of the sustainability courses offered at the university, University of Richmond still managed to only bring in 5.22 out of the total 14 points for academic courses. With the addition of the sustainability minor and the additional courses that will need to be created, the university's score in academic courses will improve. Moreover, if interest in the sustainability minor grows over time, there could be growth in this category as new courses are offered to fit demand. More points will also be rewarded to the university with the adoption of the sustainability minor through the increase in the number of departments that offer sustainability courses, as the sustainability minor is interdisciplinary.

In the curriculum category, there are also points awarded for learning outcomes (AASHE, 2017). Out of a total of 8 points, the university has earned 0.33 points. Learning outcome points are award based on how many students pursue degrees related to sustainability. Currently, the University of Richmond can only count its majors and minors in Environmental Studies and Geography and the Environment. However, with the addition of the sustainability minor drawing in students from diverse fields of study, the number of students pursuing a degree related to sustainability will increase, gaining the university more points.

### *Costs*

Compared to other sustainability initiatives that the university could pursue, adding a minor in sustainability would be incredibly cost-effective. The only major expenses that the university would need to add would be the costs associated with hiring approximately two additional faculty and extending current faculty to meet the need of the new minor. Additionally, depending on the response to the minor and the number of students enrolled, some of these new professors could also teach courses in related fields, alleviating some of the responsibility of other professors. The minor costs associated with adding a sustainability minor are more than justified considering the significant impact the minor would have on the university in terms of increased student applicants, improved student retention rates, enhanced recognition, and the invaluable worth of taking strides to help students live in a sustainable way.

### *Case Studies*

Seventy three universities offer a major in sustainability, most of whom also offer a minor in sustainability; also, many other schools offer a stand-alone minor (Vincent et al, 2013). Most sustainability minor offerings at schools integrate the three pillars of sustainability by designating classes to take from each sustainability theme, as proposed in the University of Richmond's sustainability minor. These schools can be used as case studies to evaluate the benefits of adding a sustainability minor to the University of Richmond curriculum.

Emory University is a very competitive mid-sized university that has seen success by integrating sustainability into its curriculum. Emory is located in Atlanta, Georgia, and offers 58 different minor options, one of which is sustainability (Emory University- Majors, Minors, Programs, 2018A). Emory University is currently ranked gold by the AASHE STARS ranking system. Out of 5,281 total undergraduate students, 1,128 students graduate with a degree that includes sustainability (AASHE-Emory, 2017). Emory's sustainability minor is truly interdisciplinary, with faculty on the steering committee ranging from the physics department to the German studies department (Emory University, 2018B).

Arizona State University's sustainability minor, introduced in 2010, has been wildly successful. Arizona State University is also rated gold by the AASHE STARS ranking system (AASHE-Arizona State University, 2018). With their sustainability minor, sustainability major, and other course offerings, 70% of students chose to pursue a degree that includes sustainability at Arizona State University (AASHE-Arizona State University). Students pursuing a minor in sustainability at the university come from a wide background of fields, including students from all of the university's five schools. Students are passionate and excited about what they are

learning and are confident that it will help them secure a job after graduation and help them lead a more sustainable life (Paul, 2015).

Notre Dame also saw exceptional success in its addition of a minor in sustainability. The University of Notre Dame is also ranked Gold in the STARS system (STARS- University of Notre Dame, 2014). Jessica Hellman, one of the creators of the minor, believes the benefits of the minor go beyond the classroom. At Notre Dame, the vast majority of students who choose to pursue a minor in sustainability are students who do not come from other sustainability fields, such as environmental science. Therefore, the minor not only offers the students the ability to explore sustainability themes, become better global citizens, and gain an advantage in the job market, it also creates a new academic community that is truly interdisciplinary. Students from a wide variety of backgrounds have the opportunity to connect as they work through solution-driven sustainability curriculum together. After only two years, the sustainability minor at Notre Dame became the most popular minor for students (Hellman, 2018 pers. comm.).

The sense of community that develops as a result of a minor in sustainability is not unique to Notre Dame. Creating an introductory-level sustainability course led to a sense of community among students in the minor from the University of British Columbia (UBC) in Vancouver, Canada. A study by Coops et al (2015) found that the minor brought together students from over 14 different areas of study and allowed them to form relationships over a shared commitment to sustainability. In fact, “students not only enjoyed interacting with peers from different faculties and programs, but formed mentor – mentee relationships” (Coops et al, 2015).

The University of Richmond could easily adopt a sustainability minor that emulates these schools. Arizona State, Emory University, Notre Dame, and the University of British Columbia have gold STARS ratings, have a diverse array of students pursuing the minor, and have found their sustainability minors to be popular and successful (AASHE-UBC, 2015).

A sustainability minor is an excellent way for the University of Richmond to keep pace with the direction of university education. A survey of higher institutions found that from 2008 to 2012, sustainability degree programs increased 57% (from 1,183 to 1,859). Furthermore, as of 2012, a total of 141 sustainability degree programs are offered by 114 institutions. Of those, around two-thirds are undergraduate degrees (Vincent 2013).

### *Alternative Options*

While adding a sustainability minor should be the university’s top priority, there are other ways in which the University of Richmond can incorporate sustainability into its curriculum. For example, the university could add a sustainability concentration to the Environmental Studies major, giving Environmental Studies majors the opportunity to focus their studies and potentially increasing the popularity of the major. The university could also establish a sustainability certificate through the School of Professional and Continuing Studies. This would be similar to the certificate offered by the Community Garden Project (see [Hingst](#) 2018, Chapter 7 of this volume). Ultimately, however, a minor in sustainability is proffered for its accessibility to all students and true interdisciplinary curriculum.

## *A Unique Opportunity*

It is evident by the increasing interest in sustainability from young people and from businesses that the University of Richmond has been given a unique opportunity to become a leader in sustainability education. Currently, none of the top ten liberal arts schools in the United States as ranked by US News offer minors in sustainability (The 10 Best Liberal Arts Colleges in America, 2016). If the University took advantage of this opportunity and offered a minor in sustainability, the university would act as a leader and gain competitiveness with these schools. While many schools offer sustainability minors, few of those schools are small liberal arts schools. For incoming students looking for a small liberal arts experience who also value sustainability and are interested in a sustainability minor, the University of Richmond will be able to out-compete all other liberal arts schools and gain more applicants. This is not new for the university; though a small school, the University of Richmond offers a nationally-recognized business school, top-ranked science facilities, and was the first school in the United States to offer a leadership school. Being unique and innovative is what drives prospective student interest in the university. Adding a sustainability minor will only enhance that effect.

## *Conclusion*

A minor in sustainability will be extremely beneficial to this school. Disregard the student interest in the minor, the obvious benefit to the university's STARS rating, and the minimal costs needed to look at the big picture. What the university is really doing in adding a minor in sustainability is symbolic in its nature: the University of Richmond is showing the rest of the world that it values sustainability and recognizes its importance. Sustainability is not a trend; it is a necessity. The rest of the world is moving and mobilizing to incorporate sustainability into everything humans do, as it is what humans need to do to survive. If the university does not want to be left behind, it must do the same.

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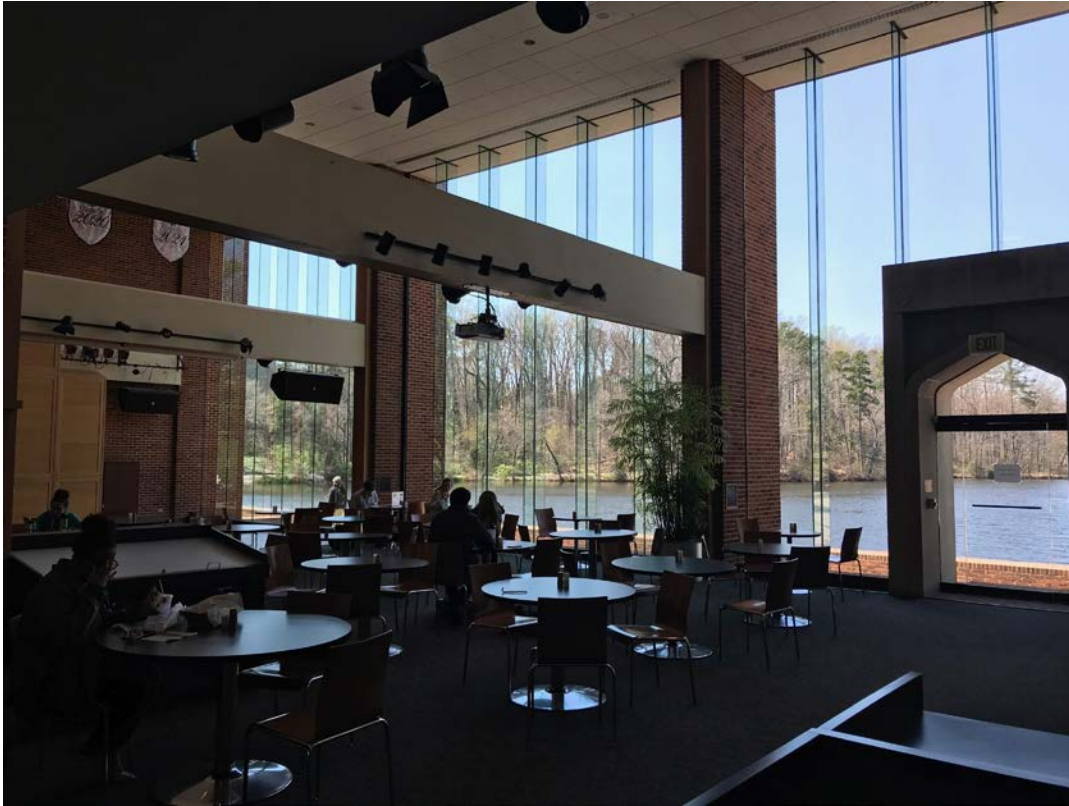
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## Chapter 3



**Figure 1** A seating area in Tyler Haynes Commons, located outside of Tyler's Grill (Jones, 2018).

# Green Dining Proposal

Caroline Jones  
Environmental Studies Senior Seminar

# Chapter 3

## Green Dining Proposal

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### **Abstract**

University of Richmond has slowly but steadily introduced efforts to reduce its campus-wide, local, and national environmental impact, notably with its commitments to achieve carbon neutrality by 2050 and to divert 75 percent of waste from landfills by 2025. Yet most eateries on campus offer their food and beverages to the hundreds of customers they serve every day only with single-use serve ware, an incredibly expensive practice in terms of cost, energy use, and the environment. This proposal suggests introducing a “for-here” option—serving food and beverages with reusable serve ware—at all eateries on campus that currently do not offer one. The introduction of reusable serve ware, in tandem with an update of the current single-use to-go serve ware (such as switching to entirely post-consumer, recyclable, plant-based, or compostable materials), could help significantly reduce the University’s waste production and support efforts to reach our waste diversion goal. It also has the potential to enhance customers’ dining experience; provide marketing opportunities for eateries, programming opportunities for the Office for Sustainability, and learning opportunities for students; and, finally, help improve the University’s rankings and reputation.

### **Introduction**

University of Richmond (UR) finalized its campus-wide Strategic Plan in 2017, and it includes a Sustainability Strategic Plan (University of Richmond, 2017). There is ample opportunity to solidify sustainability efforts across campus as this Plan is implemented, notably in UR Dining Services. UR is home to one dining hall, the Bruce E. Heilman Dining Center, and five other eateries on campus: Tyler’s Grill, The Cellar, Eight-Fifteen, Lou’s, and Passport Café. Both the Heilman Dining Center and The Cellar are sit-down dining facilities with a for-here dining experience as their main model. Therefore, the other four eateries—Tyler’s Grill, Eight-Fifteen, Lou’s, and Passport Café—are the focus of this proposal, as they currently do not offer a for-here dining option. Food and beverages at these four eateries are only offered in single-use serve ware, such as plastic and waxed paper cups and containers; yet many customers choose to dine in and do not have the option to enjoy their meal with reusable serve ware.

For example, Tyler’s Grill (Figure 1) is a favorite for affordable, on-the-go food, but its tables are often full of students, faculty, and staff sitting down for a quick bite to eat or a longer stay to do work. The description of Tyler’s Grill on the University’s

Dining Services page even encourages staying around for a meal: “Dine in or grab and go, Tyler’s is fast, fresh, and made for you” (University of Richmond Dining Services: Tyler's Grill).



**Figure 2** Eight-Fifteen coffee shop in the lobby of the Boatwright Memorial Library (Jones, 2018).

Eight-Fifteen is the University’s on-campus coffee shop located in the main lobby of the Boatwright Memorial Library, described on their University page as “a full-service café” (University of Richmond Dining Services: Eight-Fifteen at Boatwright). It is common for customers to enjoy their snack or beverage inside of the library, or to use the café as a meeting place (see Figure 2). Lou’s is another hotspot on campus, mainly for weekday lunches, and there is plentiful seating for dine-in customers (see Figure 3).



**Figure 3** Lou’s, and a large seating area in Queally Hall of the Robins School of Business (Jones, 2018).

Passport Café is another popular spot, and while many customers take their meals to go, the indoor tables and outdoor courtyard are always full of eat-in diners (see Figure 4). Passport Café has many local, vegan, and vegetarian offerings, and is working on introducing composting as a new waste management mechanism (University of Richmond Dining Services: Passport Café). It is certainly a leader on campus in terms of environmental efforts in its operations, sourcing, and offerings.



**Figure 4** Carole Weinstein International Center’s large courtyard, outside of Passport Café (Jones, 2018).

As much of the campus community frequents these four eateries for sit down meals, meetings, and places to do work, there is clearly ample opportunity to introduce a for-here option to improve both the dining experience for customers and also to reduce their environmental impact, especially in terms of single-use material waste reduction. By introducing reusable serve ware and overhauling the current single-use to-go option, the University could make significant strides towards its waste diversion goals as well as other efforts to reduce the University’s environmental impact. A for-here option would certainly enhance customers’ dining experience by making meals more authentically dine-in, especially when customers can feel good about reducing their use of single-use materials, and therefore, shrinking their environmental footprint. Other University-wide benefits are possible with the implementation of this proposal, and will be explored later.

## **Serve Ware Overhaul**

### *A New For-Here Option*

Introducing a for-here dining option at these largely grab-and-go eateries would help reduce the amount of single-use waste generated on campus, while also increasing the sophistication and versatility of the dining experiences at these locations. This project would involve purchasing and integrating an entirely new set of reusable serve ware at

each eatery based on its main food and beverage options, such as the serve ware offered at the Heilman Dining Center (see Figure 5).



**Figure 5** Reusable serve ware used at the Bruce E. Heilman Dining Center (Jones, 2018).

The needs of and best path of implementation for each eatery could be determined by their managers, staff, and even with input from frequent customers, and also in collaboration with the Office for Sustainability. A basic idea of their potential needs, though, is as follows: for Lou's, salad bowls, soup cups and bowls, small plates, cups, mugs, and silverware would be needed for its offerings, which are centered around salads; Passport Café and Tyler's Grill would likely need plates, bowls, cups, mugs, and silverware; and Eight-Fifteen, with a greater focus on beverages, would require mainly cups and mugs, but a set of small plates and silverware would certainly be useful for their pastries and other breakfast foods.

### *To-Go Update*

The introduction of a for-here option at these four on-campus eateries should not be confused with a removal of the to-go option that is the basis of many of these establishments' main business model. This project provides an opportunity for a total overhaul of the serving systems at these eateries, not just introducing a new for-here option. More environmentally-friendly serve ware could replace the current conventional materials many of these locations use, some of which are recyclable or even compostable, but some of which are neither (see Figure 6). Single-use plastic utensils, waxed paper cups and containers, and non-postconsumer materials are all major culprits in terms of wastefulness, and more sustainable options certainly exist.





**Figure 6** Single-use serve ware offered at Lou's (Jones, 2018).

Shifting to more sustainable materials, such as paper, bamboo, or post-consumer materials (especially ones that do not have to be disposed of in a landfill) would help reduce Dining Services' waste and energy contributions and its overall environmental footprint. These environmental benefits are detailed further in the Justification section. When paired with the introduction of for-here serve ware, sourcing single-use products in a more environmentally-conscious manner would represent a major improvement of these eateries' sustainability practices, and could become a substantial contribution to University efforts to meet its waste diversion goal of 75 percent by 2025 (University of Richmond Sustainability: Goals and Progress).

### *Costs and Challenges*

It is important to consider the cost implications and operational adjustments that introducing a for-here option at these eateries would entail. Of course, purchasing a new set of serve ware and associated supplies (such as dish bins and dishwashers) is the largest cost associated with this proposal. That said, overall costs will vary based on the needs of each eatery and the number of customers they typically serve each week. Operational changes may be necessary, as well. As Barlett (2017) points out, "As sustainability projects" (such as this one) "extend beyond the life of one champion to become institutional policy," changes must be made "that support longer-term commitments" (p. 190). In other words, for this proposal to be a long-term, University-wide success, policy changes regarding areas like purchasing, budgeting, staff responsibilities, cleanliness and hygiene, etc. may be necessary to ensure these commitments are institutionalized parts of UR's overall sustainability strategy.

Introducing more sustainable single-use packaging to replace the current to-go materials may prove more costly than conventional types, but these materials are becoming cheaper as manufacturing processes improve and demand increases (Choosing Environmentally Preferable Food Service Ware). Ideally, though, the reduced demand for to-go orders with the introduction of a for-here option would help offset some of these

costs by reducing the amount of single-use materials necessary for eateries to purchase. It is difficult to estimate how much new sets of serve ware would cost since each eatery varies in its size, needs, budget, and customer base, but Heilman Dining Center and The Cellar have successful for-here dine-in systems that could be used as a guide.

Although estimating the cost of a set of serve ware for each eatery is challenging, there are many identifiable ways that these costs could be offset, aside from reduced demand for to-go packaging materials. In recent decades, administrators of educational institutions are becoming more environmentally responsible (Earl et al., 2003) for financial reasons (Eagan & Keniry, 1998). For example, according to Chen et al. (2011), "...reducing waste leads to reduced tipping fee charges for waste disposal in landfills or incinerators. Implementation of energy efficient and water conservation practices save on both utilities and water bills" (p. 146). Of course, the main goal of introducing a for-here option is to reduce single-use waste, which would, ideally, produce cost savings by reducing waste disposal fees. The costs of implementing this proposal could be offset in other ways, such as introducing a small "environmental tax" for customers choosing the to-go option, such as the one currently used at The Cellar for takeout orders. An environmental tax of \$0.10 to \$0.20, for example, would encourage diners to use the for-here option, and would pass some of the costs of these changes on to the customers (Choosing Environmentally Preferable Food Service Ware).

## **Justification**

UR has made multiple formal sustainability commitments over the last two decades that must be honored. In the 2010 University of Richmond Climate Action Plan, UR committed to carbon neutrality by 2050, along with incremental greenhouse gas reduction goals of 30 percent by 2020 and 65 percent by 2035 (Office for Sustainability, 2010). UR has also committed to a 75 percent waste-to-landfill diversion rate by 2025, to be completed through efforts such as waste prevention, increased recycling, and identification of waste management inefficiencies (University of Richmond Sustainability: Goals and Progress).

Aside from its sustainability commitments, the University has also participated in various formal agreements. In 2003, President William Cooper signed the Talloires Declaration, agreeing to a ten-point plan for universities to work towards sustainability-related goals (Office for Sustainability, 2010). Four years later, President Edward Ayers signed the American College and University Presidents Climate Commitment, pledging the University to achieving carbon neutrality, among other goals (Office for Sustainability, 2010). Most recently, President Ronald Crutcher, UR's current president, signed the American Campus Climate Pledge in 2015 in support of the Paris Climate Accord, and the "We Are Still In" pledge of continued support of the Accord in 2017 (The White House, 2011). These formal agreements in which the University has taken part, along with its individual sustainability commitments, obligate it to take concerted action to drastically increase sustainability efforts on campus.

## *Environmental Benefits*

According to the United States Environmental Protection Agency (E.P.A.), “Between 1960 and 2013, the average amount of trash generated by each person in the U.S. nearly doubled” (Preventing Trash at the Source). Clearly, the best way to reduce waste is preventing waste from being generated in the first place, which can be achieved in part by using reusable items as much as possible (Preventing Trash at the Source; Jensen, 2017, p. 15-17). It can also be less expensive to use reusable items such as coffee mugs, water bottles, and other serve ware, especially considering discounts available at many retailers, including some on campus (Preventing Trash at the Source). Introducing reusable serve ware could also cut down on food waste since, ideally, fewer customers would take their food to-go (and potentially end up wasting some or all their meal later in the day), which is significant considering that food waste is a substantial part of solid waste generated in the U.S. (Thiagarajah & Getty, 2017, p. 141).

Reusable dishware also uses less energy than single-use counterparts, which are highly energy-intensive from manufacturing, transportation, and disposal processes for just one use (Reusable Dishware (Why switch?)). Of course, reusable materials can be energy-intensive, as well, but they are only manufactured and shipped once for, ideally, hundreds or thousands of uses. Reusable plastic dishes, for example, have a “break-even” point in terms of energy use of just 10 uses when compared to single-use plastic, or 17 uses when compared to paper (Reusable Dishware (Why switch?)). These points would certainly be met at the four eateries that are the focus of this proposal, considering their popularity, the size of the University community, and the fact that a typical restaurant will reuse its dishware approximately 2,500 times (Reusable Dishware (Why switch?)).

Reusable serve ware is clearly the best choice for the environment when compared to single-use options, but disposable materials remain an essential part of the grab-and-go business models many of these eateries rely on to serve customers as they run between classes, meetings, and other events. That said, bio-based products (like bamboo and other renewable natural resources) as well as other more environmentally-friendly materials (like postconsumer, recyclable, and compostable) have many advantages over conventional single-use materials (Choosing Environmentally Preferable Food Service Ware). A main benefit is their ability to be recycled or composted, but they are also usually less energy and water-intensive and less polluting, especially when produced using renewable materials rather than finite resources like petroleum (Choosing Environmentally Preferable Food Service Ware).

Considering that, “In most parts of the developed world, packaging constitutes as much as one-third of the non-industrial solid waste stream” (Preventing Trash at the Source), that effective waste management is vital for the implementation of successful sustainability practices (Ecker & Yang, 2017, p. 1), and that UR has committed to a large waste diversion goal, reducing the use of single-use packaging and other waste at University dining locations should be a priority for UR as it seeks to reach its sustainability goals. The University has already backed off its original commitment of 80 percent waste diversion by 2020 (Office for Sustainability, 2010), and there is no room

for another change like this one if UR plans to seriously reduce its environmental footprint, uphold its reputation, and become a leader in sustainability.

### *Marketing, Programming, and Learning Opportunities*

Not only would the introduction of reusable serve ware and an improvement of the to-go serve ware at campus dining locations be a highly effective way for UR to reduce large amounts of waste on campus, but it would also enhance customers' dining experience and provide major marketing opportunities for the eateries, programming opportunities for the Office for Sustainability, and learning opportunities in academics. As Bryan and Middlecamp (2017) concisely explain, "Sustainability initiatives in higher education can flourish as the result of collaborations among those in teaching, research, and operations" (p. 30). The nature of the implementation of this proposal should certainly be highly collaborative to allow sustainability to flourish at UR.

Enjoying the ability to sit down for a cup of coffee or eat soup out of a reusable bowl with silverware—all while feeling good about their new environmentally-conscious choices—will certainly make customers feel they are being offered a more sophisticated dining experience. This is especially true as customers begin to value sustainability more and more; as Laura Abshire, the National Restaurant Association's director of sustainability policy and government affairs explains, "A lot of customers today want to know what businesses are doing to become more environmentally conscious...Customers want to...go to restaurants that align with their values" (Schlienz, 2015). In the Association's 2015 Culinary Forecast—a survey of nearly 1,300 professional chefs—environmental sustainability was the No. 3 trend, with other sustainability-related themes in the top 10 (Schlienz, 2015). Sustainability is clearly increasingly important for both restaurants and customers, and now, three years later, UR's Dining Services is certainly falling behind.

Framing this dining overhaul as another way Dining Services is improving its customer experience, and as a major environmental and social responsibility effort on behalf of Dining Services and the University, would benefit everyone involved: as a major marketing and social responsibility opportunity for these eateries and Dining Services, as an improvement in University waste reduction efforts, and as an enhanced dining experience for customers. A new and improved serving system at eateries that meets customers' dine-in (and to-go) needs could certainly improve business, and with the associated sustainability benefits, all parties involved would enjoy the feeling of doing something positive for the environment.

The Office for Sustainability could introduce informational programming at each eatery that ties into their respective business models, supports the sustainable efforts they have incorporated in the past, and promotes the newly overhauled serve ware system to attract customers. The Office could highlight the environmental (and financial) benefits of using reusable over single-use serve ware, such as water, emissions, waste, and cost savings, through signage, events, and other tools. This effort would promote the important environmental aspects of this proposal while also helping to ensure the new serve ware is frequently used and enjoyed. This positive programming would provide an

opportunity to promote other important campus sustainability efforts, including Office initiatives, the Sustainability Strategic Plan, and University commitments.

Positive programs like these could also be planned, implemented, and supported by the Environmental Studies department and student environmental groups like GreenUR, which would foster broader involvement of the UR community. This project could also provide academic and research opportunities for faculty and students, especially through data collection. For example, the Introduction to Environmental Studies class has participated in waste audits in the past, and this course (with other faculty participation) could be instrumental in completing waste audits to determine waste trends over time and to help measure the impacts of this project. These studies could be taken further as Dining Services continues to implement sustainable changes; for example, “the carbon footprint of foods is one of the many current issues related to food sustainability,” and it can engage “undergraduate students in an environmental science” course (Bryan & Middlecamp, 2017, p. 37).

Academic involvement in this project could include other colleges at UR, too. For example, Leadership Studies students could explore potential social and food justice implications of these changes and identify problems and future opportunities, while business students could participate by quantifying and tracking the financial expenditures and savings incurred in the implementation of this project. In other words, studies conducted by students and faculty across all departments could be used to track the environmental, financial, and social consequences of both this project and future sustainability efforts as well as University progress towards its sustainability goals.

### *University Leadership and Reputation*

According to Chen et al. (2011), “Considering the amount of energy and water that is used, and the amount of waste and pollutants generated from over 4,000 colleges and universities in the USA, higher education institutions have a huge impact and influence on the environment” (p. 146). Educational institutions are major agents of change, and environmental change is no exception: according to Leal Filho et al. (2017), “many universities around the world have been active centers of climate change research” (p. 269). Clearly, institutions of higher education have both the responsibility and capacity to reduce their environmental impact, and UR is no exception. The University should uphold its environmental commitments and seek to reduce its environmental footprint for the sake of the environment (especially waste reduction, in this case), but it should also do so in the interest of attracting prospective new students who are increasingly interested in and supportive of sustainability (Timm, 2014). Furthermore, from the University’s perspective as a renowned institution of higher learning, sustainability is increasingly important for campus reputation and rankings.

UR’s environmental efforts will certainly become an important part of its reputation, especially as universities are increasingly evaluated and ranked against one another based on these efforts. According to Kurland (2011), “the Sustainability Endowment Institute...has issued a College Sustainability Report Card” since 2005, and the Princeton Review, together with the U.S. Green Building Council, publishes a Guide

to Green Colleges (p. 396). The Association for the Advancement of Sustainability in Higher Education (AASHE) also tracks sustainability at universities across the country through its Sustainability Tracking, Assessment, and Rating System (STARS) program. According to AASHE, UR is a Silver Level institution—and considering the size of its endowment and breadth of its resources, it could (and should) be doing significantly better.

### ***STARS Ranking***

In the Operations category of the UR STARS report, under the Dining Services subsection, UR received just 0.13 out of 4.00 points for Food and Beverage Purchasing and 1.00 out of 3.00 points for Low Impact Dining. In the Waste subsection of Operations, UR does not fare well, either: in Waste Minimization, UR scored just 0.89 out of 5.00 points, and 0.65 out of 3.00 points in Waste Diversion. Considering UR's low scores in these areas and its commitment to waste reduction and other sustainability goals, this proposal clearly provides a viable opportunity for improving these scores and UR's overall STARS ranking. A Gold Level ranking would be major positive publicity for the University, and would be especially significant considering that so many comparable (and competitor) colleges and universities are already striding ahead.

[Oberlin](#) College and [Green Mountain](#) College are two small, liberal arts institutions that have received STARS Gold Level rankings, certainly with even fewer resources than UR. Oberlin, for example, has a student-run Resource Conservation Team that conducts periodic waste audits on campus (Oberlin College: Waste Minimization, 2017). It has had a water bottle ban in place since 1999, and sends food waste to a campus property for use in organic farming. At Green Mountain College, the biology department and the sustainability office conduct yearly waste audits, and dining services uses compostable dinnerware for all special events that cannot use reusable dinnerware (Green Mountain College: Waste Minimization, 2014). The sustainability office employs a waste diversion crew that collects data on post-consumer food waste weights and trends daily (Green Mountain College: Waste Minimization, 2014). Chartwells Dining Services (the university's provider) was awarded a Green Restaurant Certification for implementing environmental changes (Green Mountain College: Food and Beverage Purchasing, 2014). UR certainly has the resources to implement programs and efforts these, and should consider these comparisons as it seeks to meet its environmental commitments and improve its reputation in terms of sustainability.

### **Conclusion**

There is significant opportunity for UR's Dining Services to make substantial contributions to the University's sustainability efforts as it begins to implement the Sustainability Strategic Plan and seeks to reach its sustainability commitments pledged in the 2010 UR Climate Action Plan, especially its waste diversion goal. A complete overhaul of the serve ware systems at Passport Café, Lou's, Eight-Fifteen, and Tyler's Grill would certainly increase the sophistication and versatility of customers' dining

experience, while also providing a marketing opportunity for these eateries and promoting a positive social and environmental responsibility image. This overhaul also provides savings opportunities for Dining Services—namely waste management tipping fees, reduced single-use serve ware purchasing, and an environmental tax on customers—as well as programming and learning opportunities for many offices, departments, and groups across campus. By taking this major step towards its sustainability goals, UR could improve its AASHE rankings, attract environmentally-minded students, and begin to solidify its reputation as a university committed to academic, athletic, *and* environmental excellence.

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## Chapter 4



*Figure 1. Source: Revision Energy.*

## Pagebrook Property Solar Power Initiative Mary Kate Jaromin

# Chapter 4

## Pagebrook Property Solar Power Initiative

Mary Kate Jaromin

Environmental Studies Major and Geography and Law in the Liberal Arts Double Minor, 2018

### Abstract

The University of Richmond has established an ambitious goal of carbon neutrality by the year 2050, with a series of benchmark goals in between (Office for Sustainability 2015). The University made these commitments publicly, creating incentive for the University to meet these goals to maintain accountability to the students and community. The University's current emissions reductions are at 18 percent from 2009 baseline levels; in order to achieve the last 32 percent of the reductions by 2050, the University must take aggressive action (R. Andrejewski, personal communication, March 1, 2018). The University owns land off campus, including the Pagebrook Property, which is around a 15-minute drive from campus and has 40 acres of flat, clear cut land that is currently unused (Love & Owens, 2014). This land would be an ideal location to begin construction of a one-megawatt University-owned solar array to begin to account for some of the University's scope two emissions in order to work towards meeting the 2050 goal of carbon neutrality, as well as earning more points to improve the University's current silver-level ranking in the Association for the Advancement of Sustainability in Higher Education's (AASHE) Sustainability Tracking, Assessment & Rating System™ (STARS). This project, although a substantial economic investment for the University, would provide educational and recreational opportunities for students and community members, would save the University money on energy costs, and would set the school apart as a leader in sustainability among other four year liberal arts universities. The University is already committed to one power purchase agreement and is under negotiation over a second, but at present, it remains unclear if owning or leasing the panels would be the more profitable option, so by utilizing both alternatives, the University would be able to study each type and determine which is better for large-scale adoption in the future.

### Introduction

In the coming decades, the impacts of global climate change will certainly have widespread and detrimental impacts throughout the world. Since the start of the Industrial Revolution, countries around the globe have been emitting unprecedented levels of carbon dioxide and other greenhouse gasses into the atmosphere, which has led to the present threat of global climate change. The negative environmental, political, social, and economic impacts of the phenomenon, such as increased intensity and frequency of major weather events, global sea level rise and ocean acidification, extreme temperatures, and increased resource conflict, will only increase in the future (Shaftel, 2017). At present, it is still difficult to predict the magnitude of global climate change because there is too much uncertainty, and its consequences will depend on the mitigation actions taken, or not taken, and how sensitive the Earth's systems are to

these emissions (Shaftel, 2017). Already, countries around the world are feeling the effects of climate change, as we have seen with the increased intensity of weather events like droughts and hurricanes in the U.S. and rising sea levels all over the world (Shaftel, 2017). However, it is possible to mitigate some of the potential future damages through the adoption and implementation of environmentally sustainable practices through policy implementation, shifts in behavior, and changes in land use practices (U.S. Global Change Research Program, 2014).

At present, most energy systems are heavily reliant on fossil fuels and the University of Richmond is no different. However, this heavy reliance on fossil fuels is risky as the availability of fossil fuels is diminishing, oil prices can be volatile, dependence on foreign countries for oil can be politically challenging, and the burning of fossil fuels is a large contributor to global carbon dioxide emissions, which has vast environmental consequences (Jacobson & Delucchi, 2011). In the face of these challenges and risks in relation to dependency on fossil fuels, research and investment into renewable energy sources, such as solar or wind has been on the rise (Jacobson & Delucchi, 2011). Within the United States, this increase in investment and adoption of renewable energy sources has been fueled, in part, by favorable government policies, through tax credits, federal grants, the creation of markets for the trading of renewable energy credits (RECs), and many other policies (Bilgen, 2014). In order to shift society away from the reliance on the finite resource of fossil fuels for energy and mitigate carbon emissions, while still meeting the needs of present and future generations, it is imperative to move towards a cleaner energy system that is reliable and efficient. Upon analyzing the technical, geographical, and economic feasibility for solar energy to meet the energy demands within the United States, Fthenakis and Kim (2009) stated, “It is clearly feasible to replace the present fossil fuel energy infrastructure in the U.S. with solar power and other renewables, and reduce CO<sub>2</sub> emissions to a level commensurate with the most aggressive climate-change goals.” This finding supports the idea that the transition to solar, while environmentally responsible is also feasible based on amount of solar irradiation and current energy infrastructure within the United States.

### *University of Richmond*

In the year 2007, then-President Edward Ayers of the University of Richmond signed the American College and University Presidents Climate Commitment (ACUPCC), which led to the creation of a Climate Action Plan in 2010 (Office for Sustainability—UR, 2010). Under this agreement, University of Richmond committed itself to emissions reductions with an end goal of carbon neutrality and the integration of sustainability into campus life and education (Office for Sustainability—UR 2010). In accordance with this goal, in April of 2016, a 204.8 kilowatt solar array composed of 749 solar panels, was installed over an area of 22,000 square feet on the roof of the Weinstein Center for Recreation and Wellness. Many of the panels are bifacial, which enables them to take in solar energy along the front panels and ambient energy through the back panels (Media & PR Office, UR, 2016). This system has the potential to offset around 364,000 pounds of carbon dioxide emissions per year, and between summer 2016 and summer 2017, the solar array produced 19 percent more electricity than predicted (Media & PR Office, UR 2016). This solar array can be tracked online so the real-time energy production can be examined and used for educational purposes (Media & PR Office, UR, 2016).

This solar installation was procured for the University under the Virginia Power Purchase Agreement Pilot Program, which means that a solar company owns, installs, and maintains the solar array. The University is contracted to purchase the energy produced by the array for the next two decades at an agreed-upon rate, but there were no other costs to the University in regard to the construction of the panels (Media & PR Office, UR 2016). The University also had a two-kilowatt solar array installed in 2011 along a block of the on-campus University Forest Apartments, and the array contributes about half of the energy used by one four-person residence (Media & PR Office, UR 2016). The University is also currently negotiating a power purchase agreement (PPA) of off-campus solar energy for the next twenty years that would allow the University to offset a larger portion of carbon emissions, but nothing has been finalized at this time (R. Andrejewski, personal communication, March 1, 2018). It is clear that the University has had success in the past with solar energy as an efficient, cost-effective, and environmentally sustainable solution to reduce fossil fuel dependence and greenhouse gas emissions. At present, the cost of energy resources is on the rise and solar technology has been decreasing in cost and increasing in efficiency, making now an advantageous time for the University to invest more heavily into solar energy.



*Figure 2. Pagebrook Property. Source: Goochland County GIS.*

## **Project Proposal Description**

In the year 2001, the University purchased the Pagebrook Property (See Figure 2 above), as a site for unspecified future development for the University (UR Office of Financial Planning and Budget, personal communication April 11, 2018). In 2005, an area of around 47 acres was clear-cut to be used a dumping site for excess dirt by the Virginia Department of Transportation during a construction project (UR Office of Financial Planning and Budget, personal communication April 11, 2018). However, in the years since then, the land has remained idle,

maintained as a grassland, with little intervention from the University. At the time of this writing, the University is not committed to any specific plan for the use or disposition of the property (UR Office of Financial Planning and Budget, personal communication April 11, 2018). The university is currently maintaining the property as a forested area, making it immune to development and tax-exempt under the original land purchasing agreement (UR Office of Financial Planning and Budget, personal communication, April 11, 2018). However, if the University decides to use the land for development or to sell the land to be developed by another buyer, then the University would have to apply with the city and, as the land would no longer be forested, the tax status would likely change. (UR Office of Financial Planning and Budget, personal communication April 11, 2018).

The proposed construction of a one-megawatt solar array in the flat, clear, cut area, currently without any practical usage, would enable the University to put the area to good use that would further the interests of the administration in moving towards the adoption of more renewable energy. The construction of a solar array of this size on the Pagebrook Property would require the use of around 7.5 to 10 acres of land (R. Andrejewski, personal communication, March 1, 2018). The proposed solar array has the potential to produce approximately 1,458,333 kwh, an energy value of \$161,000, annually (B. Stanley, personal communication, April 9, 2018). Therefore, while the construction of a one-megawatt solar array would not be able to account for the entirety of the school's energy consumption, it would be a step in the right direction towards sustainability and the achievement of carbon neutrality by 2050.

University of Richmond is already committed to one PPA and may commit to another in the next year, so the opportunity for the construction of a University-owned solar array, on property that is already owned by the school and is the perfect terrain for installing panels, would provide an important comparison to the PPAs. At present, as the shift towards solar power and other renewables is still relatively new, it is unclear if owning or leasing the panels would be the more profitable/responsible/etc. option, so by utilizing both alternatives, the University would be able to study and determine which is better for large-scale adoption in the future. By purchasing, constructing, maintaining, and operating the solar panels, the University would be exemplifying a strong commitment to sustainability efforts and would be providing the opportunity for student learning, community engagement, and positive publicity.

## **Costs of Potential Projects**

When considering the installation of a one-megawatt solar array on the Pagebrook Property, this project would require anywhere between 7.5 to 10 acres of land, which would qualify this as utility scale solar. At present, for utility scale solar, the going rate is anywhere from \$1.40 to \$1.50 per watt. Bernie Stanley, the President of Shockoe Solar, LLC, who has worked with the University on previous solar projects, predicts that this type of project would cost around \$1.50 per watt, which would bring the installation of the solar panels to a \$1.5 million project for the University. There is some room for error in this estimate, as it could be slightly cheaper or more expensive depending on the proximity to the necessary electrical transformers to connect the solar energy produced into the grid. Mr. Stanley also recommends the construction of a fence around the solar array in order to restrict access and prevent damage

to the panels, which he estimates would cost an additional \$70,000 (B. Stanley, personal communication, April 9, 2018). Although the solar panels will require minimal monetary investment to maintain, they will need to be checked on about 4 times a year to remove dirt and debris, and to be washed down if necessary.

The construction of this solar array would be a substantial investment by the University, but there is the potential for the University begin seeing returns on the investment in the next decade if the solar market continues on its current trend. The creation of this solar also, has the added benefit of additionality that many PPA's do not. The idea of additionality means that this construction will actually contribute renewable energy into the grid. Instead of merely purchasing the energy, this University action would actually be increasing the amount of available solar energy within the market. This sends a strong message to the community that the University is committed to environmental stewardship and is taking action towards a sustainable future, not only for the University itself, but for the community as a whole.

While it is clear that the construction of a one-megawatt solar array that would be owned, and financed by the University would be a large investment, there are ways to offset some of the costs so that the University is not responsible for the entirety of the investment. There are some federal grants and funding programs that the University could apply for to help cover some of the initial costs. For example, the U.S. Department of Energy's SunShot Initiative supports research, development, and deployment projects to reduce the costs of solar energy in an effort to make solar power a feasible and cost-effective option for schools, businesses, and even homeowners looking to reduce their environmental impact (Department of Energy, 2018). The Department of Energy's Solar Energy Technologies Office also supports funding opportunities for solar installations, including systems integration, technology to market, and soft costs projects (Department of Energy, 2018). However, neither program is currently accepting applications as previous submissions are under review, but there will be another round of applications in the future that the University could apply for. Another option would be to look for donations from the local community and the University of Richmond global network of alumni for this project by marketing it not only as a sustainability opportunity, but also as a project with educational benefits and research opportunities for students and faculty as well as the greater Richmond community. This potential for fundraising with University of Richmond donors for the construction of a University owned and operated solar array, will help foster an image of the University as leader in campus sustainability, acting in an environmentally responsible manner to mitigate global climate change.

## **Incentives for Adoption of Proposal**

### *University of Richmond Sustainability Commitments*

The University of Richmond has signed onto a variety of sustainability commitments, beginning in 2003 when President Cooper signed onto the Talloiries Declaration on sustainability, committing the University to achieve environmental literacy for all and the development of a culture of sustainability on campus (Office for Sustainability, 2015). In 2007, President Edward Ayers signed onto the American College & University Presidents Climate Commitment, which, most notably, required the University to develop a plan containing explicit

targets and deadlines for carbon neutrality (Office for Sustainability, 2015). These targets were laid out in the 2010 Action Plan, which committed to a 30 percent reduction in greenhouse gas emissions by the year 2020 relative to 2009 levels, and the achievement of carbon neutrality by the year 2050 (Office for Sustainability, 2015). The University has already achieved a greenhouse gas emissions reduction of 18 percent and will be on track to surpass the goal of a 30 percent reduction by 2020 if the PPA currently under negotiation is successful, but there is still a long way to go to achieve the goal of carbon neutrality by the year 2050. As the University publicly pledged to meet these targets, both the university community and the wider public will hold the University accountable in the efforts to meet these pledged targets.

*Actions by other schools*

*Table 1. Comparison of Four Year Liberal Arts Universities*

<b>University Name</b>	<b><u>Middlebury College</u></b>	<b><u>Dickinson College</u></b>	<b>University of Virginia</b>	<b>University of Richmond</b>
<b>School Type</b>	Private	Private	Public	Private
<b>Location</b>	Middlebury, VT	Carlisle, PA	Charlottesville, VA	Richmond, VA
<b>Number of Students</b>	2,561	2,382	16,655	2,999
<b>Campus Size (acres)</b>	350	144	1,682	350
<b>Endowment</b>	\$1.074 billion	\$381 million	\$8.621 billion	\$2.19 billion
<b>AASHE STARS' Rating</b>	Gold	Gold	Gold	Silver

There are many liberal arts colleges that are comparable to the University of Richmond in many aspects, but have surpassed Richmond’s sustainability efforts in regard to renewable energy. [Middlebury College](#), which ranked second on the Sustainable Campus Index in 2017 for overall top performing Baccalaureate Institutions by the AASHE, currently has a university-owned solar array and is committed to a power purchasing agreement with an offsite solar company (The Association for the Advancement of Sustainability in Higher Education, 2017). The college leases 1.1 megawatts of solar energy, and the University owned solar array is 1.5 acres and generates around 243,000 kilowatt-hours each year (Middlebury Sustainability Office, 2017). Middlebury, a leader in campus sustainability, has set an example and invested in both a PPA and the construction of a solar array, and found success with both options.

[Dickinson College](#), which ranked fifth on the Sustainable Campus Index in 2017, has a goal of carbon neutrality by 2020, does not own its own solar array, but is advancing a PPA that



would allow a company to lease land on the western part of campus and install a three-megawatt solar array, that would account for 25 percent of [Dickinson](#)'s energy (Riley, 2017).

University of Virginia, a competitor school of University of Richmond, does not own their own solar array, but has two rooftop arrays on campus, and has committed to a 25-year contract to purchase solar power from two off site solar farms, totaling 32 megawatts, which will supply around 21% of the University's demand for electricity (Kelly, 2017; Kelly, 2016). If [Dickinson](#), [Middlebury](#), and University of Virginia can achieve an AASHE Rating of Gold and Middlebury can afford to own and operate a solar array, on their endowments, then there is no excuse for the University of Richmond, which has a larger endowment per student than any of the three Universities, to be unable to move past a rating of silver or to wait any longer to invest more into renewable energies. In order to remain on track with its peers, University of Richmond needs to continue to expand its capacity for renewable energy while working towards carbon neutrality, and the construction of a University operated solar array would do just that, while also setting the school apart as a leader in sustainability.

### ***STARS Ranking***

The installation of a solar array also has many other benefits for the University, from the advancement of the STARS ranking to numerous educational and research opportunities. The University of Richmond earned a 1.44 out of 10.00 for energy, a 3.80 out of 10.00 for greenhouse gas emissions, and 0.14 out of 4.00 for green and renewable energy (The Association for the Advancement of Sustainability in Higher Education, 2016). The school currently purchases renewable energy credits and has the aforementioned solar array on the Weinstein Center Roof, but there is much room for improvement within these categories, as an increase in solar power would help reduce greenhouse gas emissions and increase the amount of renewable energy accredited to the University.

Hands-on research and education in relation to the construction of a solar array provides an opportunity for experiential learning, as classes could participate in the monitoring, installation, and maintenance of the panels. This could also lend itself to the creation of a new certificate on Solar Panel Installation and Maintenance through the School of Professional and Continuing studies, which would prevent facilities from being stuck with extra work maintaining the panels and would bring in revenue for the University.

There is also the opportunity to use this area of the Pagebrook Property for recreational activities and other sustainability initiatives. For example, the University of Buffalo's solar array is arranged into artistic designs to provide a meditative sanctuary for students, and is also intersected by walking and running trails for the community (Hill, 2018). The University of Richmond could look to replicate this, at least initially, by creating walking and running trails for students and the community throughout the otherwise idle property and could later look to expand upon the uses of this property to include other aspects such as gardens, or outdoor classrooms. The opportunities for campus engagement with this property and the University's investment into sustainability in regard to the installation of a university owned solar array would be far reaching.

## Conclusion

In 2011 AASHE reported that, “installed solar capacity [at both universities and private homes/businesses] has grown 450 percent over the last three years... as institutions have taken advantage of dropping solar prices, state and federal incentives and innovative financing mechanisms” (Hummel, 2011). It is clear that the trend among universities is to continually increase the capacity for solar and other renewable energy sources to reduce reliance on fossil fuels, and University of Richmond should not lag behind in this respect. In fact, the installation of a one-megawatt solar array that is owned and operated by the University has the potential to set the University apart as a leader in sustainability and renewable energy development among comparable liberal arts colleges, including the nearby schools in Virginia, which would serve as an appeal to prospective students. In the coming years, it is imperative that the University comes up with an alternate energy plan that is environmentally sustainable for the future, can meet the needs of present and future students, and enables the University to meet its own sustainability goal of carbon neutrality by 2050. With declining prices of solar technology and the availability of University-owned land with ideal terrain for a solar array, the University has a perfect opportunity to expand its solar energy developments. This investment would not just be a major environmental advancement for the University, but would be an investment in its future financial and admissions recruiting success.

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## Chapter 5



Photo by: <http://janinejust.com>

# Campus Thrift Store: A Small Step Towards Big Change

Ashley A. James

# Chapter 5

## Campus Thrift Store: A Small Step Towards a Big Change

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### **Abstract**

Production and consumption associated with the textile industry exhausts water and fossil fuel resources, and significantly contributes to global waste burden. Studies have shown that U.S. college students produce millions of tons of solid waste every year, much of which could have been diverted. This paper describes the benefits of second-hand markets as a tool to achieve waste diversion and sustainability, and proposes a campus thrift store at the University of Richmond (UR). Supporting literature, previous successful reuse initiatives at UR, and a review of best thrift store practices at other universities are provided as justification for the proposal. The paper concludes that a thrift store on UR's campus would be simple to implement and have a considerable positive impact on the campus community and the planet as a whole.

### **Introduction**

Due to its new strategic plan, the University of Richmond (UR) is currently in a position to create meaningful campus change. One of the five major commitments in this plan is to develop innovative practices to sustain the University's environmental, human, and financial resources (University of Richmond, 2017). An affordable and impactful way to contribute to this commitment would be to implement a thrift store on campus.

Given that the human economy is fundamentally grounded in the conversion of natural resources into waste, waste management is a major global issue. Unsanctioned waste disposal significantly harms the natural environment and wildlife, jeopardizes human health, and reduces revenue from fishing and tourism (Stickel et al. 2012). For instance, as early as 1975, the National Academy of Sciences reported an estimate of 1.4 billion pounds of solid waste entering the world's oceans annually (Stickel et al. 2012). Waste that enters the formal collection system is preferred over improper disposal, however, it still harms the environment due to the large amount of greenhouse gas leakage/emissions, leakage of toxic chemicals that contaminate soil and groundwater, and a finite amount of space (Kozar & Hiller, 2013; Nigro, Sappa & Barbieri, 2017; Raco et al., 2017). Therefore, it is imperative to push past formal waste disposal and towards waste diversion and prevention.

The United States is a major contributor to the global waste dilemma. In 2010, the United States generated 227.2 million metric tons of solid waste, seventy percent of which included durable and nondurable goods (Fortuna & Diyamandoglu, 2017). From 2012 to 2017 textile waste in particular rose from 7% to 30% (Clark, 2017). Colleges and universities can have a significant impact in reducing these numbers. According to a Columbia University study, each

individual college student produces an average of 640 pounds of solid waste per year, with college students as a whole estimated to produce over 200 million tons per year (Moscone, 2014). A lot of college students' waste could be reused, but usually ends up being discarded for sake of convenience (Moscone, 2014). As part of the commitment to sustainability, UR should contribute to changing these numbers. In general, recycling is usually emphasized the most in regard to waste diversion strategies. However, recycling is at the bottom of the waste diversion hierarchy. The top of the hierarchy refers to reduction, which stops waste at its inception. This hierarchy has been discussed and debated since the 1990's. In 1992, a researcher at Yale concluded that the waste diversion hierarchy is efficient both economically and environmentally due to reduction in environmental damages (Schall). However, he concluded that waste reduction programs and adequate markets are required for reaching waste management goals (Schall, 1992). A thrift store is a fine example of such a program/market.

The diversion hierarchy argues that reducing the number of products produced and purchased is the best form of waste diversion, however, what can be done about products that already exist? The answer is reusing, the next level in the hierarchy. Reusing saves the energy that has already been put into making a product, as opposed to recycling, which uses energy to turn an old product into something new.

Currently, UR has some programs that fall into the reuse category, such as the University of Richmond Office Supply Exchange (UROSE) and the Big Yard Sale. The University has also recently launched a new waste management campaign called "Rethink Waste," and has set a goal of 75% waste diversion by 2025 (Office of Sustainability-UR, 2018). An on campus thrift store fits perfectly into this campaign and will be a significant step forward towards such an ambitious goal. This paper proposes a thrift store at the University of Richmond and outlines the main justifications for why and how the store will create positive change.

## **Proposal Description**

In order to ensure stability and success, the campus thrift store will be a joint initiative sponsored by the Office of Sustainability and another office, such as the Office of Residence life or Student Development. The store will be funded by a share of each office's budget, as well as by generated store revenue. In order to create an opportunity for work study and student employment, all thrift store staff will be paid employees. Positions will include but are not limited to: a general store manager (s) to oversee daily operations, cashiers and store maintenance workers, a social media and marketing intern to promote campus engagement, and inventory associate (s) that will keep track of donations, stock shelves, and manage the rotation of items. Wages will vary based on position responsibilities.

The store will accept donations of clothing, home goods, and electronics from both faculty and staff to be sold at prices ranging from \$0-\$10. Store staff will be charged with the task of determining and standardizing the price of items. The Office of Sustainability's current Donation Station program can feed into donations for the store. The store can also hold drop off hours for items to be donated. Following the UROSE model, the store can start by being open for one to two days a week for a limited amount of hours, with potential to increase hours of

operation after the store is well established. Additionally, the initial store should require no more than 500 square feet of physical space. In cases where the store has more items than space, the staff will offer temporary by the bag/by the pound sales where students can purchase large amounts of items for one small price (ie: \$1). Given that there is not a lack of second-hand retail options in the city of Richmond, marketing of the thrift store will be focused on the campus community. However, like other businesses on campus, outside visitors will be welcomed to shop.

In order to minimize startup costs, the store will ideally be located in a place on campus that already exists and can be easily altered and/or is already under consideration for renovations. Three prime location options include the basement of Keller Hall, a location in Gray Court, or the Tyler Haynes Commons. Choosing an existing location will make the cost of providing a store space little to nothing. According to a 2010 study on campus thrift stores, most stores don't require any startup funds, and the ones that do usually spend between \$250 and \$750 (Bennett). For the University of Richmond store, the expected major startup costs will come from paper based marketing materials and initial wages. Racks and shelves to display clothing can be donated from campus offices, or purchased from other resale markets.

In addition to providing the campus community with a retail space for reused items, the thrift store staff will also host educational events and activities in order to inform the student body of the social, environmental, and economic benefits of reusing clothing and other goods. These events could include but are not limited to: movie screening, presentations, discussions, and workshops on creative waste diversion projects such as sewing classes and recycled art.

## **Justification**

### *Sustainability*

Sustainable development, was first defined in 1987 as “development that meets the need of the present generation without compromising the ability of future generations to meet their own needs” (Brundtland, p. 41). Ten years later, Elkington defined a sustainable business as one that meets what he coined the triple bottom line: economic prosperity, environmental quality and social equity (1997). This triple bottom line, often referred to as “people, planet, profit,” identifies three pillars of sustainability that have been set as a global standard. A thrift store addresses all three pillars and will work towards sustainability on local and global scales.

Economically, the store will generate revenue without being coupled with the environmental damage traditionally associated with production and consumption. This method of revenue generation follows the concept of a circular economy, which promotes economic growth that minimizes environmental burden (Ghisellini et al., 2015). There are many options for the thrift store revenue use such as directing funds towards other sustainable initiatives, a revolving fund, and charities. This paper proposes that the UR thrift store funds be used initially to maintain the store and pay employees. However, in the future there is promise to direct some revenue towards other initiatives once the store is well-established.

Environmentally, the thrift store will lessen the burden of waste management, reduce the amount of resources used for production of new products, and also reduce the amount of emissions from vehicles students would have otherwise used to donate unwanted items off campus. Furthermore, thrift stores combat the wasteful ideology of fast fashion, which refers to the marketing strategies of companies such as H&M and Zara promoting a rapid turnover of cheap clothing collections that imitate upscale fashion trends (Haug & Busch, 2016). Fast fashion creates a throwaway, heavy consumerism culture that exhausts both water and fossil fuel resources, and also has major ethical implications (Preuit & Yan, 2017). Second-hand markets fall under slow fashion, which serves as an alternative to fast fashion because it promotes sustainable consumption (Ozdamar & Atik 2015).

Socially, the store will provide an affordable and accessible option for students to purchase goods, as students currently have to leave campus to buy thrifted items. On a larger level, the store will contribute to reducing the demand for unethical labor, proliferated by fast fashion that produces cheap items in sweatshops (Haug & Busch, 2016). In addition, the store will contribute to reducing the demand for new landfills and incinerators, which are socially unwanted features due to their unsightliness, stench, and hazardousness, and often are disproportionately placed in lower-income communities (Sakai et al., 1996). In fact, it was a contaminated landfill placed in Warren County, North Carolina, a poor African-American community, that sparked the start of the environmental justice movement (McGurty, 1997).

The thrift store can also be an informal educational tool. Consumer knowledge of how personal behavior impacts the environment has been identified as a key priority for sustainability due to its strong influences on consumer actions (Kozar & Hiller, 2013). Studies have demonstrated that many young adult shoppers have no knowledge of the fashion industry's environmental repercussions (Preuit & Yan, 2017). One study used a pre and post-education survey to conclude that a 30 minute educational module significantly impacted college students' knowledge of and attitudes toward slow fashion (Preuit & Yan, 2017). Thus, there is evidence that the campus thrift store's workshops and educational materials, as described in the proposal description, will promote the environmental literacy of our student body and encourage students to make sustainable consumer decisions both on and off campus.

Finally, a campus thrift store has promise to increase student engagement in sustainability on campus. Studies show that people chose convenient options of waste disposal (Fortuna & Diyamandoglu, 2017). Therefore, having campus access to a thrift store will increase student involvement in reusing and help promote a culture of waste consciousness. All of these benefits will bring UR closer to meeting its sustainability goals, and contribute to raising the University's AASHE STARS rating.

### *Student Support*

As aforementioned, the University already has an annual yard sale as well as donation stations in every residence hall (Photo 1); both have been very successful thus far. The Office of Sustainability has also hosted clothing swaps, which have been well attended and well received by the student body (Photo 2). There is also currently awareness of campus sustainability issues present in the student body (Photo 3). Moreover, there have been at least three clothing swap



events on campus hosted by individual students. Finally, the store may be particularly appealing as a work opportunity for business majors because they will have the opportunity to gain skills and experience in business management.

In terms of National trends there are many indications that college students are huge contributors to the resale/reuse market. For instance, college aged shoppers are becoming more environmentally and socially conscious. In their annual resale report, TredUP, the largest online second-hand marketplace in the world, reports that millennials are 75% more likely to be motivated by the environment shopping second-hand (Clark, 2017). They also reported that 84% of millennials prefer socially conscious brands that align with their values (Clark, 2017). Furthermore, since the early 2000's, the social stigma of second-hand shopping has been nearly eradicated and replaced with a burgeoning movement towards second-hand clothing as both fashionable and sustainable (Ferraro, Sands & Brace-Govan, 2016). College-aged consumers in particular are the second-hand clothing market's major target (Yan, R., Bae & Xu, 2015). The combination of demonstrated student involvement in reuse activities, and current reuse trends provides evidence that the implementation of a campus thrift store will be well received and encouraged by the UR student body.



Photo 1: Donation station in Keller Hall



Photo 2: Sustainability interns at clothing swap



Photo 3: Students post comments for Sustainability ideas

*Thrift Store best Practices at other Colleges and Universities*

This table reviews the practices and implementation of successful campus thrift stores at five universities in order to provide context and guidance for proposed practices at UR.

School	Staff	Management	Prices	Use of Funds	Summary
<b>ReUSE at UC Berkeley</b>	Volunteers	Students	Books, readers, and office supplies are all free. Everything else in the store is \$3 or less. They also accept one-for-one trades.	Charity and store maintenance	ReUSE is a student run non-profit campus store. The store is a main resource for diverting clothing, small household items, and electronic waste from landfills and has a diversion goal of 20-30 tons of material per year. They stock the store from student donations and departments. Donations are collected via shelved stations in every building. In addition to regular store hours, they hold larger-scale events and give creative waste diversion workshops.
<b>Trunk and re-use trailer at <a href="#">Middlebury</a></b>	Volunteers	Students	At the re-use trailer, small bags cost \$3, big bags \$7, and electronics are free. At the Trunk, prices vary per item but remain under \$10.	Store management	<a href="#">Middlebury</a> has a recycling center which includes a re-use trailer where students can grab reused items. They also have Trunk, a student managed campus thrift store. Trunk holds workshops on topics related to diverting clothing and reusable good waste such as sewing classes. The store is very popular on Middlebury's campus and there are currently planning for expansion.
<b>Clark Community Thrift Store at Clark University</b>	Paid employees	Students	Prices vary per item.	Store management	This is a non-profit store that is entirely student run and is a source of student employment. It serves, faculty, students, staff, as well as the surrounding Clark community. The main goal of the store is to promote sustainability on campus and they host large sales and events to boost community engagement.
<b>SmiTHrift at Smith University</b>	Volunteers	Students	Prices vary per item.	Donated to panel chosen organizations	This store is geared towards business practices and entrepreneurship. The main goal is to provide students an opportunity to plan and run a retail business.
<b>Thrifty Tiger and Depaw University</b>	Unpaid interns	Students	Prices vary per item.	Putnam County Family Support Services	This thrift store is located in a residence hall basement. Donations are collected via donation boxes, or students can e-mail interns to set up pick-ups. The main purpose of the store is to promote campus engagement, sustainable consumption, and waste reduction.

## Conclusions

A campus thrift store is a simple yet innovative business model that addresses the University of Richmond's goal of sustaining environmental, human, and financial resources (University of Richmond, 2017). The store will help the University achieve their waste diversion goal (Office of Sustainability-UR, 2018), generate income without increasing the University's environmental footprint, and expand the campus community's access to affordable reused goods. At the same time, the store will contribute to global sustainability. A survey of the study body would have been an ideal method of evaluating student support specifically at the University of Richmond. However, national trends and the success of previous second-hand campus initiatives indicate that a thrift store will be well-received by UR students. Furthermore, successful thrift stores on other campuses serve as models and inspiration. Overall, the benefits a campus thrift store can provide for the University are ample. The proposed store is a small initiative with potential to create big changes and will bolster UR's presence as a burgeoning leader in sustainability.

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## Chapter 6



# **Improving Biodiversity Management at The University of Richmond: An Ecological Approach to Sustainability**

Maria Psarakis

## Chapter 6

# Improving Biodiversity Management at the University of Richmond: An Ecological Approach to Sustainability

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### Abstract

This paper outlines a proposal for the monitoring, management, and conservation of vulnerable species and habitats on the University of Richmond's main campus and its nearby properties. It develops a strategy for the coordinated planning and implementation of biodiversity management by conceptualizing centralized leadership, pathways for student involvement, and the creation of community partnerships with the Virginia state government and local wildlife groups. Additionally, it highlights key justifications for the execution of this project. These reasons include the successful examples of such schemes in competitor institutions, the standing of the University of Richmond in national sustainability rankings, formal University commitments to the goals of climate change resilience, and a wide range of educational benefits.

### Introduction

The well-being of humans has always been inexorably linked to the health of our local environments, as we are reliant on the continued functioning of ecosystem services such as carbon sequestration and cycling, the provision of natural resources, and crop pollination. In order for ecosystems to function properly, robust biological diversity is necessary to maintain habitats and fulfill a wide range of natural roles. Thus, the preservation of biodiversity must be included in any framework for sustainability, as it is not realistic to expect that the needs of humans now and in future generations can be met in the face of ecosystem degradation and collapse (Jax et al. 2013). However, recent studies have determined that biodiversity is dropping below safe levels for the support and wellbeing of human societies, as losing more than 10% of the biodiversity in an area has been found to place local ecosystems at risk. Based on this threshold, 58% of the world's land coverage can already be considered to be in jeopardy, and the global average of biodiversity has dropped to 85% of the standard level of species variation for functioning ecosystems (Newbold et al. 2016). Indeed, considerable scientific literature supports the idea that such widespread loss of plant and animal life indicates the planet is currently undergoing an anthropogenic mass extinction event, as outlined by Elizabeth Kolbert in her lauded book *The Sixth Extinction*. Based on current trends, Kolbert conjectures that by the end of the 21st century, total biodiversity loss will be between 20% and 50% "of all living species on earth." With these statistics and projections in mind, it becomes imperative for institutions of higher education that espouse ideals of sustainability to play a much larger and more proactive role in species protection and land stewardship. Thus, the University of Richmond must place a strong focus on creating a comprehensive biodiversity management program to properly monitor

and manage vulnerable plants, animals, and habitats on both its main campus and its off-site property.

## Proposed Framework for Biodiversity Management

### *Overview of Current Biodiversity Management*

The University of Richmond (UR) campus comprises of 350 acres of land with a 10-acre lake. In addition to this primary holding, the university owns 104 acres in Goochland County, VA (Figure 1), under open-easement with the Virginia Outdoors Foundation, an arrangement that necessitates the preservation of natural and scenic areas, preservation of land as open space, and preservation of forest and farmland as key conservation values. It is mostly forested land, with Beaver Dam Creek running through the length of the property. Additionally, UR retains 109 acres known as the Pagebrook Property in Henrico County (Figure 2), which has no such management stipulations. The northern 47 acres were clearcut and leveled in 2004, and have been maintained as grassland ever since. As a result, several areas on the Pagebrook Property constitute vulnerable habitats for animals such as the red-cockaded woodpecker, an endangered endemic bird species, and the Delmarva fox squirrel (Love and Owens 2014). Similarly, despite its conservation easement, Beaver Dam Creek in the Ball Park property is severely eroded and would greatly benefit from proper riparian-zone restoration.

While the University of Richmond Arboricultural Plan recommends that the majority of new trees planted on campus are long living, indigenous, and/or low-maintenance, there is no native-species requirement for campus vegetation. Currently, the institution has not conducted any formal assessment to identify endangered and vulnerable species on its main campus or associated property, nor has it attempted to determine environmentally sensitive areas. With this lack of ongoing monitoring, there have not been any major concerted efforts for the protection of biodiversity and ecologically vulnerable regions. However, there are currently a number of independent efforts to track local wildlife and plant species, most notably those undertaken by professors in the Department of Biology and in the Department of Geography and the Environment. For example, Professors Lookingbill and Browne have supervised independent study students to develop an online map of campus trees using GPS technology. Similarly, Professor Hayden collects plant samples from campus for use in the University herbarium. Ongoing monitoring of turtle populations in the Westhampton Lake is also taking place under the supervision of the Department of Biology, and often involves the participation of students in introductory ecology courses.

Figure 1: UR-owned land in Goochland County, VA (Ball Park property)

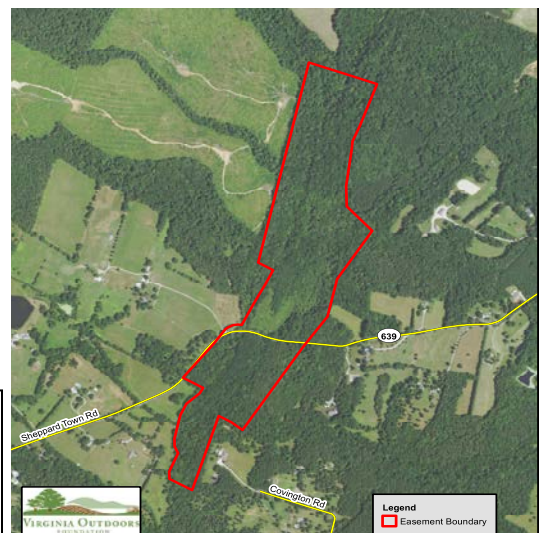






Figure 2: UR-owned land in Henrico County, VA (Pagebrook Property)

### *Planning and Coordination Strategies*

In many ways, these individual initiatives indicate that while there has not been a comprehensive program for surveying and protecting biodiversity at the University of Richmond, the basic outline of such a project is already present. It also demonstrates that there is considerable interest among both faculty and students for organizing and participating in ecological surveys. This proposal suggests that a small working group of faculty members be commissioned to create a to harness this existing momentum in a more focused, organized, and productive manner. Preferably, this committee would involve two faculty members from the Department of Biology, one faculty member from the Department of Geography and the Environment, one faculty member from the Environmental Studies Program, UR horticulturalist and landscape manager Allison Moyer, and UR Sustainability Director Rob Andrejewski. Faculty membership to this group would be on a voluntary basis, though it would be required for each of the aforementioned departments to put forth the necessary number of representatives, with the expectation of a commitment of at least two academic years.

This group would meet twice a semester to coordinate efforts in the Biology, Geography, and Environmental Studies departments to survey campus species, discuss the progress of ongoing projects, and plan future landscaping projects to incorporate sustainability goals. The committee would also take the lead on liaising with community partners. Additionally, this proposal recommends that one of the Department of Biology representatives be designated as the Biodiversity Survey Coordinator to create centralized, knowledgeable leadership for the ongoing monitoring of species on University of Richmond land. This Coordinator would be responsible for crafting a timeline and strategy for ecological assessment, designating project responsibilities to faculty and student participants in the scheme, and consolidating survey results. As there are currently two Biology faculty positions that will be open going into the 2018-19 school year, it is advised that the hiring process for these posts prioritizes candidates with expertise in wildlife

cataloguing, with the expectation that a new biodiversity specialist faculty member could take on the aforementioned leadership role.

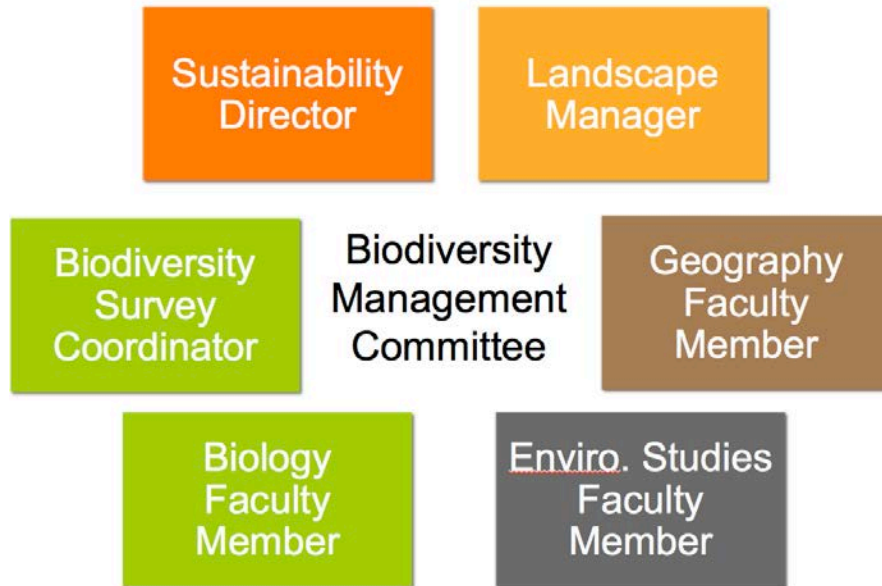


Table 1: Proposed Biodiversity Management Committee

*Pathways for Implementation*

Under the supervision of this planning committee and Biodiversity Survey Coordinator, the actual execution of this program would take place through a myriad of avenues, including partnerships with the Virginia state government, local non-profit conservation organizations such as the Richmond chapter of the Audubon Society, and student participation. The Virginia Natural Heritage Program is run by the Virginia Department of Conservation and Recreation and has the stated mission of the “identification, protection, and stewardship of Virginia's biodiversity” (Virginia DCR 2015). Through the work of staff ecologists, botanists, zoologists, contract staff, and volunteers, the Natural Heritage Program conducts inventories on Virginia private land with the permission of the landowner of rare plant and animal species and natural communities. To date, these inventories have identified over 2,200 conservation sites containing one or more rare species or communities.

A partnership with the state government to allow a Natural Heritage inventory to take place on the Richmond campus, or even on its Goochland and Henrico associated property, would represent an enormous stride forward on biodiversity management, and highlight a commitment on the part of UR to Virginia environmentalism. Collaboration with groups such as the Audubon Society and the Virginia Native Plant Society could supplement this association and create more local partnerships that would continue after the state inventory finished. For example, the University of Richmond could allow for summer bird-watching excursions to its campus and associated properties, or provide funding grants for Virginia birding field research, with the expectation that the chapter will contribute to identifying endangered bird species for the institution’s ongoing biodiversity survey. Dr. Lewis Barnett, a Richmond math faculty

member, is an active member in and the former president of the Richmond Audubon Society, and Dr. John Hayden of the Department of Biology is the current Botany Chair of the Virginia Native Plant Society.

Finally, student involvement would be pivotal in the day-to-day work of surveying and managing biodiversity. Students could participate through relevant class activities such as species mapping (Figure 3) and population monitoring (Figure 4), as well as through independent volunteer work. The latter form of engagement is particularly salient when one considers a current initiative to integrate mandatory community service into the Richmond curriculum (see [Jablin](#) 2018, chapter 1 of this volume). For junior and senior students especially interested in ecology, biodiversity monitoring and preservation activities could also qualify as a semester-long independent study course.



Figure 3: Map of campus trees created by UR student Taylor Holden '15 for a research project.



Figure 4: UR student Harleen Bal '18 holds a turtle from the Westhampton Lake during a biology class on population ecology.

## Project Justifications

### *Examples of Competitor Universities*

Upon examining how other higher education institutions similar to the University of Richmond are performing in the Association for the Advancement of Sustainability in Higher Education (AASHE) Sustainability Tracking, Assessment & Rating System (STARS) biodiversity category, it becomes apparent that UR is falling well below the curve in this category. While UR has none of the possible 2 points in this area, schools such as the College of William & Mary, [Dickinson](#) College, Washington and Lee University, and Wake Forest University all have full marks. These competitor institutions thus provide excellent examples of biodiversity management that demonstrate the feasibility of integrating such conservation goals into ethos of high performing schools like Richmond. [Dickinson](#) College in Carlisle, Pennsylvania is a particularly stellar example of a small liberal arts college that prioritizes biodiversity on its grounds and among its student population of 2,420 undergraduates. Starting in 2012, their campus Alliance for Aquatic Resource Monitoring has been working in collaboration with the 50-acre [Dickinson](#) College Organic Farm to create a new riparian buffer for a nearby environmentally degraded stream. Additionally, [Dickinson](#) has ongoing assessment and monitoring of ecologically sensitive areas, and has created a series of small ponds surrounded with native, flowering vegetation to attract and shelter insect predators and parasites at the college farm ([Dickinson](#) Center for Sustainability Education 2015).

The College of William & Mary in Williamsburg, Virginia, whose 1,200-acre campus is home to a 160-year-old coastal plain forest and a 40-acre lake, has also been proactive in biodiversity management. With an undergraduate enrollment of 6,276, William & Mary is a public institution that is nationally recognized as a leading liberal arts university. In regards to formal assessments of biodiversity, they have conducted three comprehensive multi-year/season floristic studies to identify and describe all habitats within the boundaries of the woods and lake, along with providing documentation of all vascular plant species encountered in those habitats. Overseen by faculty-mentored students, these formal studies have taken place approximately every twenty years, with the most recent in 2016 (Case 2016). The college also has created a position to oversee on-going monitoring beyond these surveys, as the College Conservator of Botanical Collections has the mission of promoting and developing plant collections for teaching, research and outreach. Continuous formal research programs also aim to monitor community stability in the wooded area, such as a project that studies deer populations to halt damage to sensitive habitats from deer overabundance (Roller 2015).

Wake Forest University, a private liberal arts school in Winston-Salem, North Carolina is very similar to the University of Richmond in its undergraduate enrollment of 4,955 students, its campus size of 340 acres, and its academic selectivity. Here, faculty, led by the Biology Department, have conducted surveys of tree species, bird species, and aquatic organisms. In the 100-acre Reynolda Gardens area of campus, which includes not only a formal garden but also includes a native meadow preserve, woodlands, freshwater ponds and stream wetlands, the local chapter of the Audubon society also conducts surveys (Coffey 2015). This collaboration supports the feasibility of creating such a partnership at the University of Richmond. Wake Forest has also been active in North Carolina state conservation efforts, and has converted 17 acres of the campus to a native Piedmont meadow, an effort that created an environment for plant and animal species that are otherwise disappearing around the state (Dixon 2016).

Additionally, Washington and Lee University in Lexington, Virginia is another private liberal arts college similar to UR that has engaged in community partnerships to further its biodiversity management goals. Though Washington and Lee's student population is smaller than UR at 1,830 undergraduates, its property holdings are in fact larger at 430 acres. Its implementation of a rigorous on-campus biodiversity monitoring scheme makes clear that a small student body is not a barrier to successful ecological management. Through a collaboration with the Virginia Outdoors Foundation, Washington and Lee conducted two assessments of campus biodiversity, one in 2005 and one in 2014, to investigate threatened or endangered species and environmentally sensitive areas (Hodge 2017). As the University of Richmond's Goochland property is already under open-easement with the Virginia Outdoors Foundation, it is reasonable to expect a similar assessment could be performed on UR property through this association. On the whole, this section aims to emphasize how competitor institutions have already a wide range of initiatives to monitor, manage, and protect their biodiversity, a fact that should serve as both inspiration and motivation for UR to develop its own programs.

### ***AASHE Sustainability Index Scores (STARS)***

The proactive endeavors of other institutions also highlights how the University of Richmond is especially lacking in the 'Biodiversity' category under the AASHE STARS ranking system. As mentioned, UR currently has 0 out of a possible 2 points, and the qualifications for getting full marks are relatively simple. The three main requirements are that the school has conducted an assessment to "identify endangered and vulnerable species (including migratory species) with habitats on institution-owned or -managed land", that the school has surveyed environmentally sensitive areas, and that the school has developed plans or programs to "protect or positively affect identified species, habitats and/or environmentally sensitive areas." (UR Office of Sustainability 2016). Even if all of these qualifications are not met, the institution can still receive partial credit for its endeavors. Furthermore, the proposed framework for biodiversity monitoring and conservation could also give UR additional points in other STARS categories, such as 'Landscape Management,' 'Community Partnerships,' and 'Sustainability Planning,' a contribution that would be especially helpful in propelling Richmond towards the AASHE gold ranking in sustainability that denotes a school as a leader in environmental performance. As the rudimentary framework to meet the 'Biodiversity' qualifications already exists, there is no compelling reason not to further coordinate campus efforts so that these endeavors fulfil the requirements in this category. While UR is currently lagging behind other institutions in the assessment and protection of native species, it also has the potential, through the steps outlined in this proposal, to become a major trailblazer in this field.

### ***University of Richmond Commitments***

Beyond motivations to stand up to competitors and raise the University of Richmond's environmentalist profile, a key justification for introducing a biodiversity management program lies in UR's existing formal agreements and commitments to sustainability. One of these goes back to 2003, when President Cooper signed the Talloires Declaration, agreeing to a ten-point action plan for universities to prioritize goals such as the "adoption of environmentally sound industrial and agricultural technologies, reforestation, and ecological restoration" to create "an equitable and sustainable future for all humankind in harmony with nature." One of these tenets,

‘Practice Institutional Ecology’, specifically speaks to campus operations as an extension of a sustainability agenda, with signatory schools agreeing to “set an example of environmental responsibility by establishing institutional ecology policies and practices of...environmentally sound operation” (Association of University Leaders for a Sustainable Future 2003). Likewise, in 2007, President Ayers signed the American College and University Presidents Climate Commitment, committing UR to pursue climate neutrality and to “integrating resilience into their curriculum, research, and campus operations” (Second Nature 2007).

President Crutcher recently solidified the University’s commitments to these goals, both in 2015 by signing the American Campus Climate Pledge to support the Paris Climate Accord objectives, and in 2017 he signed the “We are still in” declaration of continued agreement. The language of the former document asserts that a signatory school “pledges to accelerate the transition to low-carbon energy while enhancing sustainable and resilient practices across our campus” (The White House 2015), a statement that highlights how Richmond has committed itself not only to changing its energy sourcing and consumption but to integrating sustainability into general university procedures. The University of Richmond cannot say that it is truly living up to any of these three promises without monitoring and protecting vulnerable species and habitats on its properties, as healthy local ecologies that can perform necessary ecosystem services are absolutely vital to a region’s climate change resilience. Indeed, it is necessary here to understand that these documents are not using ‘resilience’ simply as a meaningless buzzword; its definition specifically refers to the ability of something – in this case an environment – to adapt to or absorb disturbance without shifting to an alternative state and losing function (Cote and Darling 2010). Overall, if these declarations and pledges are to be more than empty language, Richmond must take strategic action to implement these climate change and sustainability goals in its day-to-day campus operations.

### *Educational and Mental Wellness Benefits for Students*

In addition to the numerous motivations for implementing a biodiversity management scheme at the University of Richmond as a matter of reputation and commitment, there are also important didactic benefits to such an initiative in furthering the quality of environmental education at the institution. With students involved in the process of cataloguing vulnerable species and areas, as well as coming up with and implementing project ideas for preservation, it is an ideal opportunity to employ the UR campus as a living laboratory and to provide experiences of active participation in conservation activities. Such opportunities could make Richmond stand out much more to prospective students looking to study biology and environmental studies. It would differentiate UR from other similar schools with these proposed hands-on class activities and unique research offerings for wildlife monitoring and management. Furthermore, according to [Oberlin](#) professor and environmental activist David Orr (1992),

The way education occurs is as important as its content. Students taught environmental awareness in a setting that does not alter their relationship to basic life-support systems learn that it is sufficient to intellectualize, emote, or posture about such things without having to live differently.

This quotation underlines the necessity of fully integrating sustainability commitments into UR’s campus operations and showing students how to practice what one preaches. While students can

learn in classes the importance of preserving biodiversity and its relevance for social, economic, and environmental sustainability, such lessons are much more powerful when taken in tandem with active commitments to these values on the part of the University. Furthermore, recent studies have demonstrated that university students' active participation in nature stewardship not only provides direct benefits to local environments but also fostered students' sense of place, enhanced their attachment to their campus, and improved their overall mental wellbeing (Krasny and Delia 2015). Such positive psychological impacts can also have long-term implications for student behavior and attitudes towards sustainability, as emotional affinity and connection to nature and place has been found to be linked to more pro-environmental behaviors (Jones 2013).

## **Conclusion**

Overall, the framework created by this proposal would result in a much more informed and ecologically conscious approach to land management and sustainability at the University of Richmond. By learning which species and habitats are endangered on the property and endeavoring to improve their conditions, the school will be doing its part in conserving Virginia's rapidly diminishing biodiversity, in furthering its students' environmental education, and in ensuring the local environment will be preserved in a fully functional state for future generations. The importance of these purposes cannot be overstated, and the achievement of these goals will mark Richmond as a frontrunner in ecological stewardship, and area in which it is currently lagging behind similar institutions of higher learning. Through the implementation of this project, the University would both be taking a major step towards more fully integrating sustainability into the school's everyday operations, and working to endow its students with a holistic understanding of how individuals and institutions can have make a positive impact on natural surroundings.

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## Chapter 7



Furman Farm, sustainability project of Furman University.  
<https://fufarm.wordpress.com/2010/11/29/where-it-all-began/>

# University of Richmond Community Garden Project

Ganon Hingst

# Chapter 7

## University of Richmond Community Garden Project

Ganon Hingst  
Environmental Studies Major 2018

### **Abstract**

In today's society the growing, buying and consuming of local foods is skyrocketing in demand. It provides for a healthier and more sustainable lifestyle that the University has stated its interest in promoting. This project to expand the current community garden on campus would not only promote the University's strives in sustainable practices, but also draw the community and campus together. This garden could produce foods that could be sold to the current dining services, and to the local community generating some profit from this community garden while also reducing the University's spending on food for the dining hall. Furthermore, a graduate certificate program could be created at the University for those interested in some sort of agricultural practices at the school. This garden could be an outside lab for biology, ecology and other sciences while also giving the University the potential to create new classes in the science curriculum, for example an introduction to agriculture class. By expanding the current garden the University will reap the many benefits that it brings, while also appealing to the future generations that will be applying to the University in the years to come.

### **Introduction**

The University of Richmond has taken great strides with their commitments towards sustainability efforts around campus and in the schools culture, however the University still has a long way to go to accomplish it's commitments and to improve the school and culture to become a leader in sustainability amongst other liberal arts schools. Most schools around the country are graded and compared on their sustainability efforts through STARS (Sustainability Tracking, Assessment and Rating System). The University of Richmond currently has a silver rating, which is not terrible but most certainly needs to be improved so the University can prove itself as a leader in sustainability efforts amongst other liberal arts schools. Furthermore, Richmond needs to become a leader amongst the community in their sustainability efforts, which will bring more positive attention to the school and future perspective students. With these efforts this is a proposal of a project where the University of Richmond expands the current on campus community garden along the Gambles Mill corridor all the way until it reaches River Road. This project would generate future perspective student interest, have potential to increase the University's STARS rating, generate revenue and even have potential to expand it's current curriculum offered at the University of Richmond.

## Project Details and Other University Programs to Reference

This project and plot of land could potentially be upwards of 4 acres from the beginning of Gambles Mill to where it meets River Road. Of course this proposed project does not need to use all 4+ acres of this land to complete the project, but it shows that the University has an ample amount of land in this area to expand the garden to a reasonable size

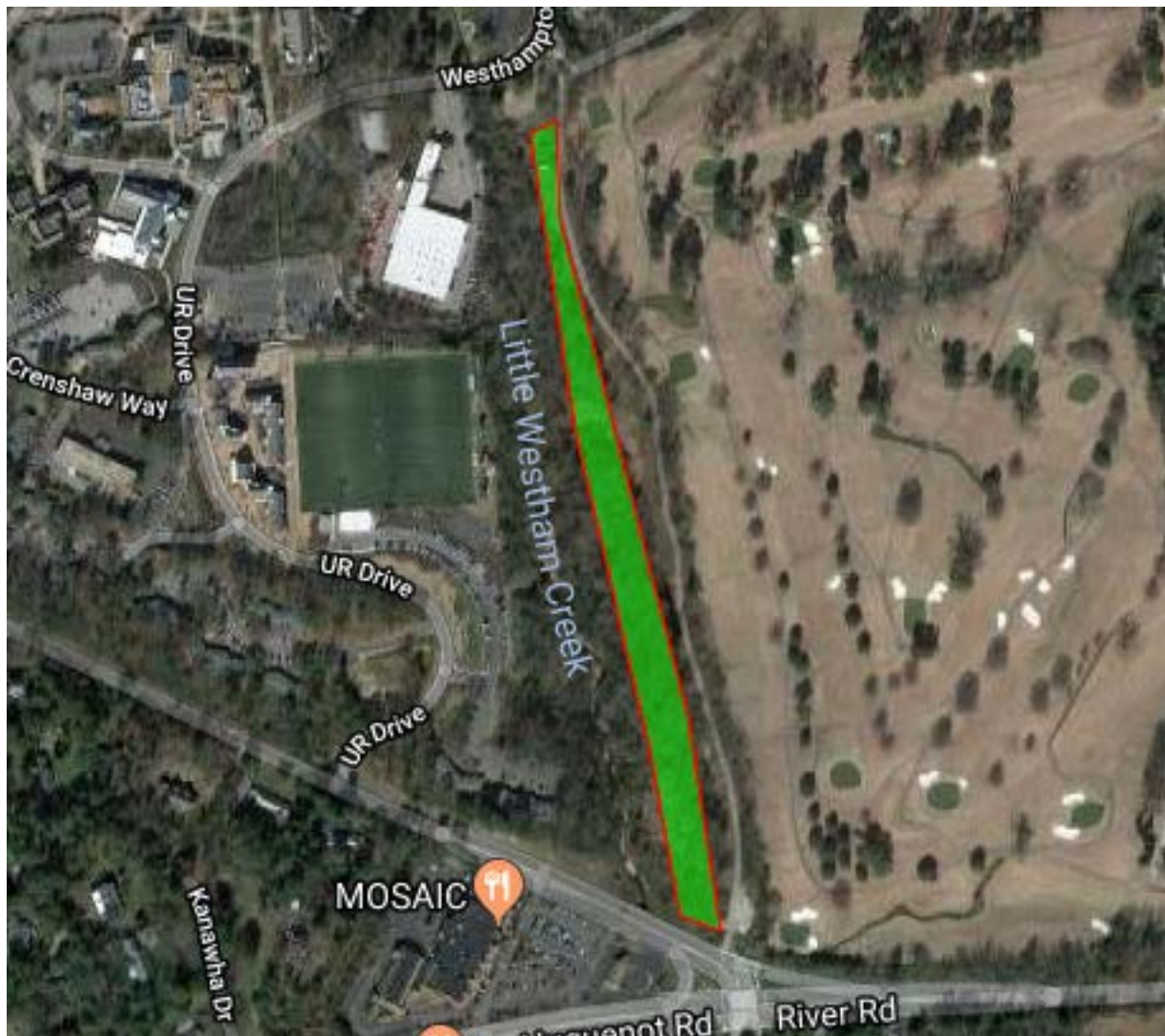


Figure 1: Proposed area to expand garden is highlighted in green\*

Two schools that this proposal can be based on are Duke University in Durham, North Carolina and [Furman](#) University in Greenville, South Carolina. Furman University is a leader in sustainability being one of the top 10 rated liberal arts schools for sustainability showing their dedication and proven to work agricultural programs. Furman's plot is a lot smaller than the

University of Richmond's can be, with it only being  $\frac{1}{4}$  of an acre however they have been able to see success with their garden, or farm, with such a small amount of land allotted. [Furman](#) is perfect to compare projects with due to their school being very similar to the University of Richmond with size, student population, liberal arts curriculum and ect.



Figure 2: Furman University's Campus farm

Duke may be a significantly bigger school comparatively, but Duke University has a very similar size in the plot of land that can be used on the campus of Richmond. Duke currently has their garden, or farm, on 1 acre of land and has shown great success to the school as well. One of the programs that both of these schools have implemented involving the garden is participating in a CSA (Community Supported Agriculture) program.



Figure 3: Duke University's Campus Farm

## Garden Upkeep and Maintenance

A main question coming up for this project is who exactly would run the garden and keep it maintained? There will be a lot of moving parts in efforts to run the garden, but it should be fairly simple and relatively cheap as well. Of course there would need to be a few staff members who are either already on staff at the University, or the University would hire one or a few for general maintenance and everyday upkeep of the garden. However, the University could open up the garden to the community to volunteer to gain experience and learn how to plant and harvest correctly. There could even be an opportunity to rent out plots for community members to pay a certain fee in order to plant in a very specific area. They would maintain their own crops while the University is also getting additional revenue. Furthermore, there could be student volunteers work the garden as well. A fellow classmate of mine, Callie Rountree-Jablin, is working on a project of a student volunteer program at the University of Richmond as well and this garden could be opened up into her project as an activity that would count towards her student volunteer program (See [Jablin](#) 2018, Chapter 1 of this volume). The students would sign up in slots to volunteer for this through Callie's project and this could cover a good amount of the work that is needed to be done on a daily basis for the upkeep of the garden. Furthermore, to get people working on a regular basis who would be able to learn how to use the tools and being efficient at gardening so they could do harder tasks, the University could offer student jobs to incentivize students who have an interest in agriculture or gardening, or simply just want a little extra cash. These students would be trained to do harder and more skillful tasks for the garden upkeep and become regular workers. Their pay would essentially be paid for through the number of programs generating revenue for the garden so the school would not essentially have to spend

any extra money. Of course there will need to be someone in charge of the managing of the garden and its programs and that could fall into the jobs of head grounds keeper, even head of sustainability (Rob) or even hire an outside person who has an extensive background in agriculture. There are a lot of options for the gardens structure, but the University will have volunteers and staff to maintain the garden and keep it in pristine shape. Furthermore, the University can start an outreach program in where the teaching of young kids or underprivileged kids on how to garden and introduce them into agriculture would take place. Current farmers markets, like the Goochland Farmers Market, have outreach programs similar to this that the University can base the programs off of as well. The garden would be able to generate community outreach, get more exposure about the garden programs, which will increase the amount of people who volunteer as well. Currently the garden in 2018 has 26 plots and 23 of them have already been claimed or renewed. For the remaining three plots there is a lottery system in place for those who are interested in getting a new plot that is open to faculty, staff and students. With this much interest already in place, if the garden was open to the community there would be an even bigger surge of interest for the on campus garden creating more demand, volunteers and more revenue.

## Curriculum

With the expansion of the garden the University will be able to add numerous more levels and variations to its science programs. In chapter 2 of this volume, [Egner \(2018\)](#) discusses the idea of adding a sustainability minor to science program. With the expansion of the garden it opens up those classes needed to have a live open outdoor lab space. Furthermore, by using the economic program and statistics of the garden from selling to the community and to the dining hall, it gives great hands on, on campus experience for classes like sustainable business and environmental management. Campus gardens and farms have been shown to be important spaces for learning. This garden will give hands on and concrete experiential learning experience that is absent in the classroom. This garden will give the opportunity for research and experiential learning to take place right on campus (Ahmed et al, 2017). A survey done at Dartmouth, where a community farm/garden was created, showed that 72.33% of the students who responded to the survey identified that the farm/garden based component of research activities to be the most valuable course component contributing to their understanding of ecological agriculture, followed by classroom activities (Ahmed et al, 2017).

This garden could also open up an option for the University of Richmond to start a graduate certificate program within agriculture field of study. The University of Richmond would give hands on training and would attract new students to come and think of attending the University of Richmond for this program. It would give the students opportunities that didn't major in a science based curriculum, or anything to do with agriculture, a chance to expand their minds and horizons through these large variety of different options for curriculum. Furthermore, these programs would give addition help to maintaining and working the garden.'

## **Community Program**

The Community Supported Agriculture program would be very simple and easy to set and launch with the new garden. People around the community in Henrico and in the City Limits would sign up and pay a monthly fee (Furman's being 60\$ a month and a student discount of 32\$ a month) and receive a bag of freshly picked produce from the garden every week (Furman Farm- Furman University 2018). Duke University does this CSA program a little differently though. They have options for a fall and summer membership where you sign up to receive produce for 18 weeks and pay a flat rate of 450\$ for those 18 weeks (Duke Campus Farm- Duke University 2018). Either way the program is run it can be profitable by essentially selling some of the produce to the surrounding community. The community surrounding the University of Richmond is known to be upper class, which tends to spend more money on raw vegetables and pays more for sustainable and organic food, which is what the University could offer them through the CSA program. Furthermore, more and more millennials are moving in the city of Richmond and tend to have decent paying jobs. According to the U.S. Department of Agriculture, studies have now shown that when income in a millennial's household increases, so does the spending habits for unprocessed foods like fruits and vegetables (Kuhns et al, 2017). This CSA program would hone in on these two separate communities that tend to have a higher tendency of purchasing raw unprocessed foods. However, this is not the only service the garden could offer in regards to selling the produce.

## **Justifications**

### **A. STARS Rating**

This project could increase the University's overall STARS rating as well and help us get on track to becoming a leader in sustainability. There are a few areas that the University of Richmond can improve greatly on and there are some areas that are low bearing fruits that would be easy to get points for and boost the schools rating as well. Some of these areas include Dining Services and Curriculum. The community garden project could potentially boost all of these areas and the overall score of University of Richmond.

The Dining services have a current STARS score of 1.13 points out of 7. Obviously there are some points to be earned in this category that wouldn't be too difficult to achieve. In this overall category Richmond scored a 1.00 out of 3.00 points on Low Impact Dining, and 0.13 out of 4.00 points on Food and Beverage Purchasing. (STARS- University of Richmond Report, 2016) With the new on campus garden, Richmond would be able to practice low impact sustainable practices with the crops grown while giving some of the fruits and vegetables to the dining hall. This would give Richmond points in the low impact dining area as well as in the purchasing category.

Furthermore, the garden could also improve the rating in the Curriculum section of STARS rating system. Richmond currently has 16.55 points out of 37, which can be improved (STARS- University of Richmond Report, 2016). By offering more classes that pertain to sustainability, have more on campus living lab areas, more field work opportunities and even



potentially new courses would drastically increase the University's STARS rating for curriculum. With the garden Richmond would be able to teach sustainable practices and have an outside living lab example of this. Furthermore, biology, ecology and all different science subjects could use the garden for labs, fieldwork and even hands on learning. Finally, Richmond could begin to offer an introduction into agriculture or sustainable gardening or any sort of new course that could pertain to the garden and have student interest.

The University of Richmond aims to become leaders in sustainability amongst other liberal arts colleges. Food production has created an integrating context for sustainability on campuses throughout the country and has been praised for its impact (Eatmon, 2016). Food production on campuses has been proven to be impactful while teaching and demonstrating sustainable practices, which the University needs to be doing in order to become a leader.

## **B. Dining Hall**

The University of Richmond spends around 6.1 millions dollars a year on food for the dining hall (STARS-University of Richmond Report, 2016). Being able to cut down on this price while also getting very good quality of food would be a perfect fit and would make economic sense. According to the Bureau of Labor Statistics the average cost for a tomato is 1.77\$ in the United States, while the average cost to grow a tomato is .25\$ (Bureau of Labor Statistics, 2018). This is saving on average around 86% for growing instead of buying certain foods. Of course the garden will not cover anywhere close to all of the dining hall's needs for fresh produce but it can at least cover some and save the University money will also gaining revenue from the CSA program. The University would not be limited to growing only during the summer and fall either. There are different crops that can be grow in the winter like onions, shallots, asparagus, kale and brussels sprouts, all of which are already provided in the dining hall. Furthermore, like Duke University, Richmond can set up temporary greenhouse buildings, which would allow the school to grow certain crops year round depending on the demand. The head of Heilman dining Joe Wolff and the head of residential gardening, Glen Pruden, have both expressed interest in the school starting to grow it's own food for the dining hall on campus. However, they were in favor of growing off campus on another parcel of the land the University owns but that idea never got any momentum. Now this project proposes easier access, easier transportation and more uses for the garden with it being on campus. Both of these heads have shown an interest and show an interest now in the school growing it's own food on campus giving this project staff support.

## **C. Student Interest**

A last and crucial part of this project is student/prospective student interest in having an on campus sustainable garden. Without student interest this project would be dead in the water. The University wants to keep attracting future Spiders to come to the University of Richmond and keep up with growing trends among the new students Richmond is applying every year. The millennial generation has seen a resurgence in interest in agriculture and sustainable gardening. A study done by the Washington Post stated that around 69% of young farmers, or people who grow their own crops in their backyard as a hobby, have college degrees in something other than

agriculture (Dewey, 2017). This shows the increase in young people's interest in growing sustainably. These students and the future students do not want to solely study agriculture or otherwise they would go to Virginia Tech and Texas Tech and other big schools with top of the line agricultural programs. These students wish to study something else but also be able to learn about gardening and growing their own food without it being their main field of study. The University of Richmond garden would do exactly that. It would attract tons of the future students applying to colleges that have an interest in gardening or agriculture in a smaller more personal sense, which is shown to be dramatically growing in the current generation applying to colleges. The University of Michigan did a survey and it was seeing the current student population interest in on campus gardening and sustainable agriculture. Of those who answered the survey, 84% of the students said they had some kind of interest in a community on campus garden and sustainable agriculture (Young et al, 2016). University of Michigan is of course a completely different school that works on a different dynamic than the University of Richmond. However, in this case it does not matter. This was sampling the interest in these topics among the students who were all studying different things and at Michigan for a different reason. Overall, it shows how general student interest in on campus gardening among the current college age kids and kids applying to college are fairly high. The University of Richmond Garden would continue to attract future students and would attract an even broader net of students who are interested in gardening and sustainability. This would continue to keep Richmond in the eyes of up-coming generations of students applying to colleges.

## **Conclusion**

The University of Richmond has opportunities to become a leader amongst other schools in sustainable efforts. The Community Garden Project will be a great stepping stone to start accomplishing this. The on campus community garden can provide the University with extra points in the STARS system making us a more notable sustainable practicing University. Furthermore, the garden has potential to generate revenue and engage the community along with saving the University some money through dining services. Finally, the University needs to continue to cater to the interests of the perspective students of the future. This project would have all of these benefits plus more for the University.

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## Chapter 8



*Photo Taken by Olivia Folger*

**A Proposal for Riverfront UR:**  
An Analysis of Green Spaces and Time Spent Outdoors in  
Relation to Student Health and Well-Being

Harleen Bal

## Chapter 8

# A Proposal for Riverfront UR: An Analysis of Green Spaces and Time Spent Outdoors in Relation to Student Health and Well-Being

Harleen Bal  
Environmental Studies Major, 2018

### **Abstract**

In an effort to improve student well-being, connection to nature, and community engagement with nature and green spaces, the following paper details a proposal for Riverfront UR (RFUR), an initiative to acquire property along the James River for use by University of Richmond students. The proposal began in Dr. Salisbury's fall Geography 345 class, and this analysis builds upon that proposal by delving into the connection between student health and quality of life with time spent outdoors and in natural spaces. Indeed, a riverfront off-campus property would be competitively advantageous for the University and would likely improve our STARS ratings, as well. The paper includes and builds upon previous information gathered towards the Riverfront UR Proposal with emphasis on student health and well-being.

### **Introduction**

#### *Technology and Nature: A Difficult Balance to Strike*

During an age when technology in the form of phones and computers increasingly consumes our precious commodity of time, the advantages of such technology are evident, such as faster communication, efficiency in tasks, and access to data, for example. However, the inherent consequences of our newfound time commitment to being plugged-in are beginning to unfold as we hear about arising issues, such as "nature deficiency disorder" in youths, increasing levels of anxiety, and the emerging negative health effects of social media (Louv, 2008). Some would also argue that the shift towards reliance on technology has indirectly caused a shift away from nature.

#### *Time Spent Outdoors as College Students*

For students, college students in particular, this easily becomes the case as one slips into a monotonous routine of attending classes, doing homework, studying, working, and socializing, most of which take place indoors. While the University of Richmond's beautiful recreation and wellness center allows in swaths of natural sunlight through its windows, the indoor gym is still just that, indoors. Students can make time for the outdoors, of course, by participating in a sport, organizing trips with friends, or even utilizing the Outdoor Adventure and Recreation (OAR) facilities, for example. There is nothing quite alarming about limited time spent outdoors, objectively speaking. However, numerous implications for student health, community, and experience are interwoven with time spent in nature and outdoor recreation. This paper delves into these implications in detail, and proposes an initiative to catalyze student connections with the James River.

### ***The University of Richmond: Background***

As a leading liberal arts institution in the United States, the University of Richmond strives to set an example for students and fellow institutions that reflects the broader impetus for global sustainable change and stewardship, while also building interconnected, engaged communities. The University of Richmond's 2017 Strategic Plan's emphasis on education, access, inclusivity, engagement, and stewardship echoes the 17 United Nations' Sustainable Development Goals and implements the framework needed to catalyze such change on an institutional level. Specifically, UR's Strategic Plan mirrors the UN's goals of quality education, responsible consumption and production, reduced inequalities, and sustainable cities and communities, among others. In addition to these values, the Strategic Plan outlines the five major goals for the University as academic excellence, access and affordability, inclusivity within the university community, enhanced alumni engagement, and lastly, stewardship (Office for Sustainability—UR, 2010)

The University of Richmond has recently spearheaded several initiatives to follow the Strategic Plan. For example, UR strives to increase racial and socioeconomic diversity, shift towards carbon neutrality, and expand study abroad opportunities. In the following paper, we will discuss a student-driven initiative to propose investment and sustainable development of a property located along the James River in an effort to improve student well-being through green space, foster an inclusive campus community, and enhance stewardship of the environment.

### ***Riverfront Access and Student Health***

Riverfront UR (RFUR) is a proposed plan to significantly strengthen the student community, provide opportunities for student engagement near the James River, and improve student inclusivity overall. The proposal began in the fall semester of 2017 when students of *Geography 345: Society, Economy, and Nature* took on the project. Since then students have researched various subjects in relation to acquiring and utilizing riverfront property, such as the spatial analysis portion of research, mapping accessibility, location, and a map-based market projection. Another group took on the economics of the project, conducting a market analysis, in order to estimate the various current and future values of properties and the assets associated with each. Some students conducted a comparative analysis regarding our closest competing universities and comparable liberal arts institutions to learn how other institutions are currently using off-campus plots and engaging with the environment. In this analysis, we will delve into the health and well-being benefits of more exposure to green space and increased time spent in the outdoors, a likely outcome of acquiring and developing riverfront access, in relation to student health and well-being.

The objective of the Riverfront Project is largely to take advantage of our proximity to the James River through the creation of a sustainability and recreation center that provides educational engagement opportunities through direct access to the ecologically vibrant river and acres of wilderness along the James River. Of course, exact plans of how such a plot would be utilized is yet to be formally determined, but some possibilities include the aforementioned sustainability and recreation center, an outdoor classroom, a small research center, a mindfulness natural area, and other forms of green spaces.

## **Justification**

### ***University of Richmond: Improving Student Quality of Life***

Although UR's campus was ranked the #6 most beautiful campus by Princeton Review in 2017, its suburban campus creates advantages and disadvantages to student life. The campus environment limits students' abilities to engage and bond with one another through meaningful experiences outside of the familiar territory of campus. Although having an established, familiar campus is indeed a privilege, we must not forget that learning is experiential. To this end, the University has invested in UR Downtown to provide students with more meaningful engagement with our increasingly dynamic city. However, our students' opportunities for off-campus education and connection to nature remain limited.

Furthermore, the typical UR student strives to optimize their academic performance by making academics a major priority and investing much time in school-related work. In addition, UR students often seem caught up in a whirlwind of academic and social obligations as their days are filled with constant flow from obligation to obligation with little pause. One may observe the stream of students heading purposefully towards their next meeting, class, or engagement in the Tyler Haynes Commons around midday on any given weekday. While busyness may imply a high level of productivity, an overfilled schedule of continuous mobility has downsides, as well. Stress levels, particularly around exam times, soar amongst students on campus. It is a rare sight to find a student not reading, writing, or working on a laptop while relaxing outside; this is not to say that working outside is not worthwhile, rather, investing unstructured time outside in nature or for reflective activities would be extremely beneficial for students. The implications of this tendency for academic achievement and busyness oftentimes hold negative effects on health, due to elevated stress levels and a lack of recovery or relaxation from the constant mental energy, such as anxiety, depression, and sleep problems.

One could argue that an implicit testament to the high levels of students on campus can be found in the recent initiatives for mindfulness springing up, such as Mindfulness Mondays and "Zensdays" with Dean Boehman. While healthy eating, exercise, and mindfulness are just a few ways to combat stress, along with understanding one's limitations towards commitments and work, spending time in nature is another scientifically-proven means of improving mood and overall health.

While researching the possibility of utilizing land along the James River, the potential to increase student engagement with green spaces and natural open areas held enormous implications for improvement of student mental health and quality of life. Further in this paper, the research regarding the correlation of time spent outside with health will be presented, from which stems the logical argument to propel students to spend time outside, through such proposed initiatives as Riverfront UR.

### ***The Literature: Time Spent Outdoors and Health***

A vast array of literature exists, delving into the correlations between social, mental, and physical health and well-being in relation to time spent outdoors and exposure to green spaces. The breadth of such studies is wide and encompasses numerous age groups, demographics, and

lenses through which to interpret the findings of such studies. To provide a general sense of the findings of such studies, we will delve into a variety of such studies in following section below to provide an overview understanding of the literature, which will be followed by specific findings applicable to students on campuses.

In regard to stress on a biological level, a study by Klaunig et al. (2016) explained a study conducted, in which participants visited a natural park, taking pre-visit and post-visit samples of saliva. The saliva was used to measure levels of cortisol, a hormone linked to stress. The findings of the study demonstrated a significant decline in the levels of cortisol after the visit to the natural area, as well as a positive correlation between time spent at the park and cortisol reduction (Klaunig et al., 2016).

Another article by Okvat and Zautra (2011) discussed a nationwide survey that found that children diagnosed with ADHD who participated in after-school activities during which they spent time in the outdoors and greenery, experienced a reduction in ADHD symptoms. Another study by Wells and Evans (2003) studied the psychological distress and self-worth of rural children who lived near vegetation compared to students who lived comparatively farther from vegetation. It was found that in rural settings, in which children lived near high levels of nature, life stress tended to be lower. Therefore, the findings of the study imply that vicinity to nature, particularly for younger children, could be a factor that could be used to mitigate stress, a factor that is amply present on the academic campuses of universities.

Nisbet and Zelenski (2011) find that outdoor walks in natural environments resulted in greater happiness for participants than indoor walks, although participants tended to underestimate the extent of the benefit of walking in nature. Furthermore, Nisbet and Zelenski (2011) articulate that it is likely that individuals do not maximize the time they spend in nature and therefore do not capitalize on increasing their own happiness and satisfaction.

Last, yet iconic, a well-known study by Ulrich (1984) demonstrate that patients recovering from cholecystectomies tended to have “shorter postoperative hospital stays, received fewer negative evaluative comments in nurses' notes, and took fewer potent analgesics” in rooms that held a window facing a natural scene versus a brick wall. The study shows that a single detail, as simple as the natural landscape viewed through a window, is just one subtle factor that reflects the underlying psychological role of nature in our lives and in regard to our well-being, a notion that should fully be utilized when designing and improving campuses for students.

### ***Sustainability and Green Spaces in Relation to Student Health and Well-being***

Krasny and Delia (2015) argue that we must direct our attention to sustainability initiatives focused on the human-nature relationship. The authors argue that such initiatives hold several benefits, such as enhancing “students’ sense of place” and improving mental well-being. Krasny and Delia (2015) also mention that university policies regarding sustainability tend to place little priority on the student relationship with nature, although numerous studies draw attention to the necessity of spending time in nature in order to foster proper, healthy development. Furthermore, perhaps Jones’ (2013) best summarizes the need for sustainable campuses that integrate student involvement with the outdoors by introducing the concept of the



“Biophilic University,” which refers to a progressive metaphor that challenges our current concept of sustainability on campuses; the metaphor refers to “a university which restores an emotional affinity with the natural environment (Jones, 2013).

While all of these studies further the notion that time spent in the outdoors and in the vicinity of green spaces improves well-being for most people, one particular study by McFarland et al. (2008) specifically delves into the implications on student health on campuses. The study begins by explaining that the perceptions students hold of their academic experience and campus setting correlates to academic accomplishment, a statement we may find fairly intuitive. The article further explains that the study reported was conducted to research “the relationship between undergraduate university student use of campus green spaces and their perceptions of quality of life at a university in Texas” (McFarland et al.,2008). Indeed, the study investigated the relationship and found that students who spent more time in green spaces tended to rate their cognitive function and quality of life higher than their counterparts who spent less time in green spaces (McFarland et al., 2008 ).

Given the vast amount of literature that exists, regarding the psychological and physical influences of spending time outdoors or simply in the vicinity of nature, it goes without saying that the quality of life of UR students would improve with increased exposure to nature. The question of how to bring out such an increased exposure subsequently arises, and a possible solution lies in Riverfront UR, the aforementioned proposal to invest in sustainable and “green” usage of a plot along the James River. While the possibilities for such a plot are boundless during these initial stages, the existence of such a property and perhaps, facility, would undoubtedly result in a greater number of students spending time outdoors, as well as an overall increase in time spent in natural environments. Not only would such increases result in happier students, a goal that would be rewarding alone; student happiness relates to better perceptions of quality of life, better academic performance, and lower perceptions of life stress. These factors, subsequently, benefit the University of Richmond as an institution, as well, considering happier students make for a more fulfilled university and campus experience, which thereby foster a stronger campus community and future investment from graduates, due to such a rewarding experience. In addition, by improving student health and well-being through increased access to the James River, students would be further helping carry out the goals of the University of Richmond’s Strategic Plan. Furthermore, the University of Richmond’s sustainability rankings in the form of STARS through AASHE would likely improve, due to increased points in campus engagement and even public engagement, through programs and opportunities at Riverfront UR (AASHE 2017). Indeed, such a green space would require stewardship and the fostering of an inclusive community, two of the goals within the Strategic Plan, as well (UR 2010). With the student and faculty health benefits of spending just a little bit more time outside, our University will continue fueling the practice of gradual evolution and improvement as we work on bettering our campus and experience through initiatives, such as Riverfront UR.

### ***Challenges and Concerns to Address***

After considering the information gathered and the findings of the research, last semester, the class compiled the information and major findings into a manner that would be presentable to an audience. To do this, the class presented to a group of professors, faculty, and other individuals involved with initiatives of this sort, in order to receive useful feedback and input.

The class presented the major findings and overall objectives of the project; one section focused on the comparative analysis of the riverfront project while the other focused on the market analysis and economics of the project. The methodology of the initial stages of research are outlined below.

## **Methodology**

The following methodology section comes from the final paper from Dr. Salisbury's Geography 345 class, and includes excerpts from various students' methods explanations. This section outlines the steps taken towards initiating this proposal and how information was divided and gathered (Bal et al 2017).

### ***Peer Institutions***

After analyzing the Top 25 Liberal Arts Colleges according to U.S. News and Report and the University of Richmond's Top 10 Undergraduate Admission Competitors, the majority of institutions were found to own property in natural areas that students, faculty, and staff utilize for research and recreational purposes. Of the Top 25 Liberal Arts Colleges, 20 have property in natural areas. Of the University of Richmond's Top 10 Undergraduate Admission Competitors, 8 own land in varying natural areas. These results show a strong correlation between high-ranking colleges and universities and owning property in nature. The natural areas have been used for a number of activities, including research, living laboratories, internships, recreation, orientation programs, living-learning communities, community outreach programs, and more. These areas exist in woods, along lakes and oceans, and on top of mountains, but none own property on rivers, making UR Riverfront a unique opportunity for the University of Richmond to stand out among competitors.

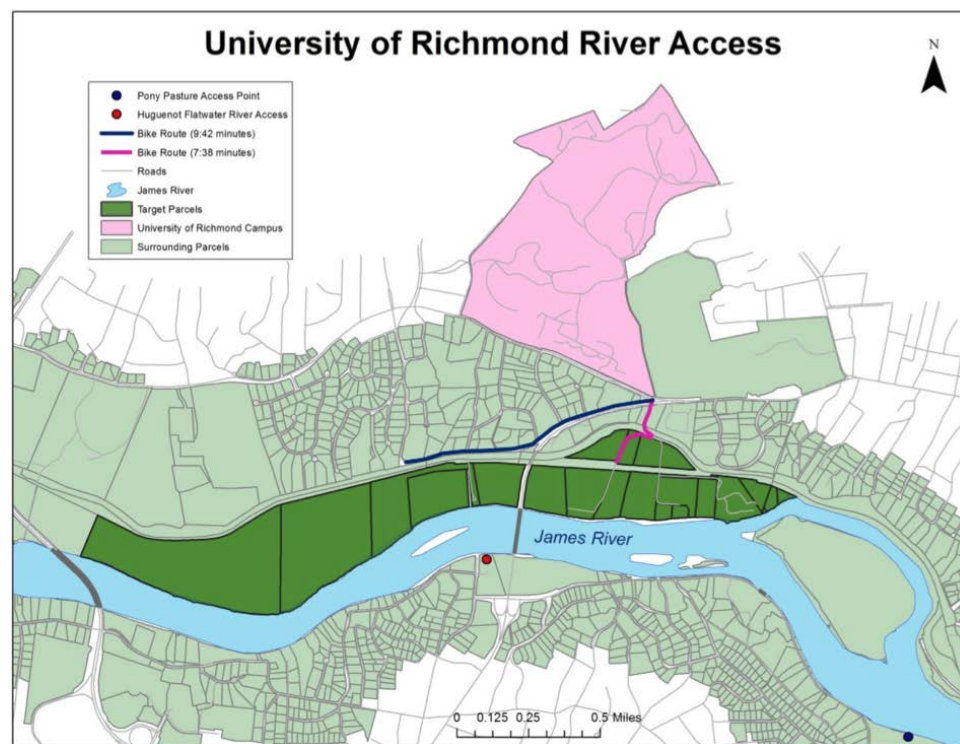
It is also important to recognize the significance of owning property in natural areas in terms of admission decisions. According to the Princeton Review (2017), 64% of college applicants stated having information on colleges' commitment to the environment would contribute to their application/attendance decisions. Owning property in natural areas is a way of showing commitment to the environment and to nature, while also benefiting students socially, mentally, and academically.

### ***Accessibility***

Even though the University of Richmond campus is incredibly beautiful and serves as a selling point for prospective students, it can feel extremely isolating. For many students, especially freshman, leaving campus can be intimidating and difficult, especially without a car. People often use the phrase "the campus bubble" to describe UR. Students don't realize just how easy it can be to walk or bike to places like the Starbucks on River Road.

Throughout the course of this semester, students in Geography 345 went on several bike rides to the James River in order to see for themselves just how accessible the river could be. The class found that by taking the Gambles Mill Corridor to River Road, crossing the intersection, and following the car lanes to the bridge that runs over the James, the river, and the shopping centers passed on the way, can be quite accessible.

Four separate routes were taken; one to the Huguenot Flatwater boat launch, one to Pony Pasture and two routes to residential areas on either side of the Huguenot Road bridge. The routes taken to the northern side of the river (the side closest to the University of Richmond) were significantly faster and more accessible than the routes taken to Huguenot Flatwater or Pony Pasture (See accessibility map below). Despite the advantage of proximity, there is no existing public access to the river on the northern side. Students must cross the bridge if they wish to access the river and, for many, this can be seen as a major barrier to river access. Although the bridge is wide enough to allow for bike access, it has no formal bike lanes to make the route safer. Another thing to note is that while Huguenot Flatwater is an access point, Richmond residents use this point primarily as a boat launch rather than to swim or wade in the water. Pony Pasture provides the best experience for swimming and wading, but it also happens to be three miles away.



**Figure 1. Map of James River Properties and River Access**

**Map contributors: Ethan Boroughs, Conor Tenbus, and Savannah Kelly**

Purchasing a property on the northern side of the river would provide students with the easiest and most direct route, allowing them to get there in anywhere between 7-9 minutes on a bike and around 4 minutes in a car. Providing students with an accessible and convenient plot of land would break down many of the preconceived notions that students have about the isolation of our campus, allowing students to see that in reality, we are quite close to a wide range of resources. Along with this property, the University will most likely have to adopt a new system for providing students with bikes to access the river. As of right now, the yellow bike system is majorly flawed because many of the bikes end up in the lake or damaged and unusable by the end of the semester. Implementing an accountability based bike-share program similar to NYC's

Citibike program, DC's lime bike program, or Richmond's newly implemented RVA Bike Share, will increase student accountability for bikes and allow UR to provide students with higher quality bikes that students are excited to ride, and perhaps utilize to access the James River. This will encourage students to think of bikes as a viable transportation option; one that can perhaps be incorporated into their commute once they graduate from Richmond. Biking is an incredibly effective and environmentally-friendly means of transportation that will not only combat the UR campus' isolation but will also encourage sustainable practices in the future.

The proposed University of Richmond Riverfront would be a unique recreational and education facility in higher education. Creating an integrated experience with the James River will not only increase awareness about the river, but will also increase sustainability practices similar to those implemented within the city of Richmond because students will feel directly responsible for the wellbeing of the environment around them.

### ***Market Analysis***

Initially data was gathered from the City of Richmond Real Estate Assessor and Zillow to evaluate the market values of (1) recently sold properties and (2) properties for sale in our targeted zones along the James River. Among the data collected was: market price of property, size of property in acres, flood risk, tax value of the property, distance from campus, ease of river access and whether the property is an open lot or contains a structure. We then created a chart to evaluate a property's estimated price per acre based on the following factors: whether it is an open lot, distance from campus and ease of river access. To do this, the list prices of the properties and divided by acreage according to the various groupings of factors (i.e. open lot close to campus without river access).

According to the figures of the recently sold properties, pricing on the upper end (open lot close to campus with river access) reached \$2,714,130 per acre. Pricing on the lower end (open lot close to campus without river access) is estimated at \$147,727 per acre. Among the for sale properties, the upper end contains those close to campus: open lot without river access is estimated at \$618,811 per acre, and a non-open lot with river access is estimated at \$1,138,609. The lower end contains properties further away from campus (>2 miles): open lot with river access is estimated at \$373,958 per acre, and non-open lot with river access is estimated at \$313,919 per acre.

Finally, four of our 11 target recently-sold properties were identified as high-risk for flooding according to the FEMA floodplains map. These four properties fall under the "100-year floodplain" category, which designates the land as being at 1% risk of flooding annually. Over a 30-year mortgage period, FEMA estimates a one in four chance of flooding for these high-risk properties. In Virginia, the average annual flood insurance premium is \$583 a year, but this estimate will vary depending on the property characteristics.

### ***Poster Presentations***

Subsequently, after conducting the aforementioned methodology, several students presented the posters and engaged in one-on-one discussion with the audience members, receiving feedback, comments, and suggestions, along with questions (Bal et al 2017).

This informal presentation introduced several helpful elements of critique regarding going forward with the prospect of attaining riverfront property. First, in general, the notion of investing in a riverfront property for the purpose of engaging students and accessing the river was well-received and supported; indeed, several of our professors/faculty were fully in support of the broad idea and offered several possible next steps. Suggestions for continuing the project included conducting a more in-depth economic cost-benefit analysis of the properties, along with a narrowing down of our potential properties given the conditions we deem as most important to the plot, such as river access, acreage, or sale status. Second, they suggested determining whether the area of the floodplain influences limitations for building and developing plots. An additional suggestion was to monetize the potential benefits of investing in riverfront property. Indeed, for economically-minded parties to understand the advantage of investing in riverfront property, the various student benefits and overall advantages of investing in the property must be expressed in monetary terms that can be weighed against costs in a quantitative manner. Lastly, we also wanted to make sure to investigate all possible angles through which the project would be of positive impact for the university—economically, spatially, healthfully, and academically, which prompted further research to be conducted in the realm of student health and wellbeing in relation to natural environments.

In terms of next steps, viable property options should be sought out and analyzed. In addition, a proposal should be presented to higher levels of administration, along with interested faculty, students, and staff to determine how next steps should be molded for the project Riverfront UR.

### **Conclusion: To the River and Through the Woods**

As we expand the boundaries of our intellectual thought, we should consider expanding the campus environment in which we learn, discuss, and experience. Investing in a plot adjacent the James River would serve to strengthen a student body in need of reinvigoration and exploration. The academic, social, and economic benefits of investing in such potential would be well worth the financial cost, especially considering the long-term value of the property and student usage potential combined with the implications for student health and well-being by spending more time outdoors.

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## Chapter 9.1

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### Sustainability at Colby College



#### PROFILE:

- Located in central Maine, [Colby College](#) is the 12th oldest private liberal arts college in the U.S. Colby focuses on Baccalaureate students and offers 58 majors and 35 minors
- 2,000 undergraduates.
- Property: 714-acre main campus overlooking downtown Waterville and the Kennebec River Valley, plus the off campus properties, a 34-acre nature preserve, a 10-acre lakefront property, and an off campus resource center.
- [Endowment](#): 775 Million USD
- [AASHE 2017 Rating/Rank](#): **GOLD** ranked 4<sup>th</sup> most sustainable baccalaureate school
- Most recent sustainability report: <http://www.colby.edu/vpadmin/wp-content/uploads/sites/157/2017/10/2016-17-Sustainability-Overview.pdf>



## Sustainability at Colby College

According to the Sustainable Campus Index by AASHE, Colby College is a top performer for sustainability overall, and they are specifically excellent in the areas of [air and climate and grounds](#). In terms of air and climate, Colby became a national leader in 2013 when they achieved 100% [Carbon Neutrality](#). The College now uses all renewable electricity and wood biomass for heat and hot water. In addition, they buy renewable energy credits. They also have reduced emissions through waste management, geothermal heating, LEED certification for all new buildings, and low building temperatures. Furthermore, Colby installed a [solar farm](#) last year even though they were already carbon neutral.

In regard to grounds, Colby has the [COFGA](#), which stands for Colby Organic Farmers and Gardeners Association. COFGA is a club where students manage an on campus garden and greenhouse. The garden produces food for the campus dining hall as well a local food pantry. The students involved learn about sustainable agriculture, and also have opportunities to share their knowledge people in the community (ie: volunteer at community garden). Due to COFGA, Colby's dining hall is known for specializing in vegan and vegetarian options.

Another “grounds” feature Colby has is the fact that the entire Colby campus is technically a [State Wildlife Management Area](#). They also have [three off-campus natural space properties](#): (1) A nature preserve that's classified as a National Park Service Registered National Natural Landmark. It's a 34-acre kettle-hole sphagnum bog used for biology, geology, and ecology courses. (2) A 10-acre lakefront property used for studying the Messalonskee Lake. (3) A Maine Lakes Resource, where visitors can see rain gardens, buffer plants, and other erosion prevention techniques. The building serves as a public meeting and office space.

Finally, there are some admirable aspects of Colby's environmental curriculum and campus community. For one thing, Colby's Environmental Studies (ES) department offers [three majors](#): environmental policy, in environmental science, and in environmental computation. These majors are still interdisciplinary, but they offer room for specialization in a specific areas of interest. This is important because the ES field is so broad and if a student finds that they are particularly interested in one thing, interest areas allow them to tailor classes to that interest. In addition, Colby offers an ample amount of [ES course options](#). Furthermore, Colby has a lot of [faculty members](#) exclusive to the ES department that perform research. Thus, there are lot of explicit environmental studies research options for ES majors.

Regarding [campus community](#), Colby has a RESCUE (Recycle Everything, Save Colby's Usable Excess) program that collects clothing, furniture, and other items that students leave behind to donate or sell. This saves 525 cubic yards of goods from landfills. The EPA named this program a “best management practice” in 2003. Colby also has an [environmental advisory group](#) composed of students, faculty and staff. This group advises the college president and community on sustainability issues and they have a role of roles that relate to maintaining and promoting environmental stewardship on campus.

Overall, Sustainability at Colby College is bolstered by the environmental geography of Waterville, Maine. However, they are able to excel in sustainability mainly because the institution has a bold commitment to sustainability to the point where it is ingrained in the school's main mission. This has allowed Colby to be a sustainable leader and achieve goals/initiatives that impact their campus community as well as the planet as a whole.

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## Chapter 9.2

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### Sustainability at Dickinson College



#### PROFILE

- Private Baccalaureate College, undergraduate program only ([US News Profile 2017](#))
- Total enrollment: 2,420 undergraduates ([US News Profile 2017](#))
- Property: 144 acres, 50 acres of which are a student-run organic farm ([US News Profile 2017](#))
- Endowment: \$447,500,000 (Dickinson College Website: [Financial Operations](#))
- [AASHE 2017 Rating/Rank](#): **GOLD** ranked 5<sup>th</sup> most sustainable baccalaureate school
- Most recent AASHE sustainability report: <https://stars.aashe.org/institutions/dickinson-college-pa/report/2018-03-01/>

## Dickinson College: Integrating Sustainability into Class, Campus, and Community

Ranked as the fifth top performing sustainable campus by the Association for the Advancement of Sustainability in Higher Education (AASHE), Dickinson College is a private liberal arts college with 144 acres of land and a total enrollment of 2,420 undergraduates [as of 2017](#). Located in Carlisle, Pennsylvania, a small, college town approximately 125 miles east of Philadelphia, Dickinson's rural environs have allowed it to develop a 50-acre student-run organic farm and begin building a 3-megawatt solar array in a nearby cornfield to help meet its [2020 carbon neutrality goals](#). These innovative projects are key examples of Dickinson's strong commitment to sustainability and the passion that Dickinson students have for supporting and participating in campus initiatives, as well as creating projects of their own. This environmental focus is apparent in almost every facet of the college's operations, dedication that is clearly reflected in its high AASHE scores – particularly in categories of community engagement and academics. While certain components of Dickinson's operations and investments could be improved, the school is, on the whole, an excellent example of how small colleges can successfully implement ethical and sustainable strategies.

In regards to teaching students about sustainability and advancing environmental education, Dickinson's agenda is very strong. As of 2015, all Dickinson undergraduates must take a course on sustainability as a general degree requirement. Furthermore, the college offers over [one hundred courses in thirty-nine departments](#) that are related to sustainability, incorporating an interdisciplinary approach to the topic. Dickinson also has had a Center for Sustainability Education (CSE) since 2008, founded in tandem with the launch of its main institution-wide sustainability initiative. Its mission statement promises universal sustainability education, holding that "Every Dickinsonian will develop the knowledge, skills and passions for helping create an inclusive and just world that is socially, economically and ecologically sustainable." With an annual operating budget of \$164,020, the CSE plays a major role in [fostering student learning about sustainability](#) across a wide range of mediums, from working with faculty members to promote the inclusion of environmental issues in courses, providing sustainable education grants, to supporting co-curricular programs. [Examples of such co-curricular endeavors](#) include the campus bee cooperative, the aforementioned organic farm, a residence hall for sustainable living, a bicycle cooperative, and programs that allow students to monitor local water resources and participate in sustainable building and facilities projects such as energy efficiency planning and solar panel installations. [Community outreach](#) is also a main component of the CSE's mission, which it has accomplished through a wide range of partnerships, including those with local farmers markets, conservation projects, and the Pennsylvania Association for Sustainable Agriculture. Overall, the CSE and its initiatives have made Dickinson a leader in sustainability education, as well as in campus and public engagement.

Beyond academics and engagement, Dickinson has also worked to integrate sustainability into its general operations and administrative coordination, demonstrating a holistic commitment to environmental goals that goes beyond the classroom. As previously mentioned, Dickinson is aiming to achieve [total carbon neutrality](#) by 2020. Its commitment comes in two parts, the first being a 25% reduction of 2008 greenhouse gas emissions that result from buildings operations, purchasing electricity, commuting and other activities. It is this 25% that will be partially addressed by the aforementioned 3-megawatt solar array. The other 75% of emissions reduction is

to be achieved through the purchase of carbon offsets. Along with the CSE, Dickinson also has an [Office of Sustainability & Facilities Planning](#) that solely focuses on integrating sustainability into operations, and has lead responsibility for this climate action plan. In regards to Dickinson's physical campus, its grounds were given a perfect score (2/2) on biodiversity and a high score (1.63/2) on landscape management from AASHE's Sustainability, Tracking, Assessment, and Rating System (STARS). Dickinson has consistently worked to [monitor vulnerable species and environmental areas on campus](#) and put in place programs to protect wildlife and natural spaces. For example, natural areas are maintained with plant species that provide habitat and food for wildlife, particularly native pollinators, and stream restoration has been conducted on Yellow Breaches Stream that borders the Dickinson property.

While Dickinson is not entirely divested from fossil fuels, with these investments continuing to make up 4% of the college's endowment. However, despite this, the college has worked to integrate sustainability goals into the institution's administration, make investment practices more transparent, and adhere to "[environmental, social, and governance principles](#)" when investing. Dickinson developed a specific high-level committee in 2012 – the President's Commission on Environmental Sustainability (PCES) – for centralized coordination of all aspects of the college's sustainability efforts. Members of this group are appointed by Dickinson's President and include senior officers of the college, faculty, staff, students, and alumni. A subcommittee of PCES is [Dickinson's Sustainable Investment Group](#), which has the purpose of providing a forum for the discussion of questions about the college's investment, as well to act as a bridge between the Board of Trustees' and the wider Dickinson community. Overall, Dickinson is striving to incorporate sustainability into all aspects of the college, from curriculum to operations, and it is wholeheartedly succeeding in many ways. In areas that are currently lacking, clear strategic planning is in place to remediate such issues, reinforcing the college's strong commitment to environmental and social responsibility now and in the future.

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## Chapter 9.3

Ganon Hingst  
Environmental Studies 2018  
Richmond College, Environmental Studies Major

### Sustainability at Furman University



#### PROFILE:

- Private coeducational baccalaureate Liberal Arts College. School of Arts and Sciences; 60+ majors; Certificate and Non-Degree programs; Graduate Studies Program (Furman University)
- 2,731 undergraduates, 153 graduate students (Furman University)
- Property: 750 acres of main campus including a 28 acre lake (South Carolina Independent Colleges and Universities)
- Endowment: \$661,000,000 (Furman University- Assets)
- [AASHE 2017 Rating/Rank](#): **GOLD** ranked 5<sup>th</sup> most sustainable baccalaureate school
- Most Recent AASHE Sustainability Report:  
<https://stars.aashe.org/institutions/furman-university-sc/report/2018-01-19/>



## **Furman University: Paving the Way in Sustainability**

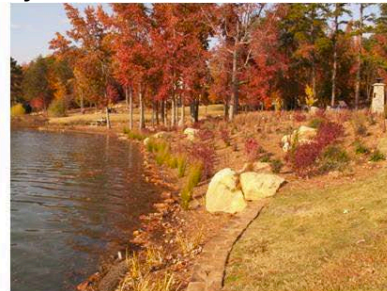
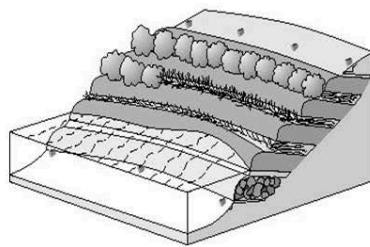
Furman became the first liberal arts university to offer a major in [Sustainability Science](#). This major requires classes in the natural sciences, human systems and social systems, while also covering classes in Environmental Security, Human Security and Sustainable production and consumption. This major in Sustainability goes hand in hand with Furman's commitment educate their students on the topic of Sustainability and has even added a general education requirement that touches on the topic of Sustainability as well. In Furman's general educational requirement they have a requirement labeled as a course addressing [humans and the natural environment](#) (Furman's general education requirements include a course addressing humans and the natural environment, one of the two courses under their "Global Awareness" requirement). This is something the University of Richmond can implement into their general educational requirements as well which can address on the curriculum part of sustainability ([Jablin](#), 2018 chapter 1 in this volume proposes that Richmond starts a work study/sustainability general education requirement). The description under these kinds of courses that would count towards this general education requirement says any course that would address the interactive relationship between humans and the natural environment.

Another aspect of Furman that is unique to Furman and their goals of sustainability is their [Shi Center for Sustainability](#). Furman built a new building specifically for Sustainability. The Shi Center holds sustainability classes, offers fellowships and internships in Sustainability while also "supports efforts to weave sustainability into courses of all disciplines, from the obvious subjects like biology and environmental science, to the not-so-obvious, like English, music, and Asian studies" (Furman University, 2018). The Shi center is dedicated to implementing Sustainability into every aspect they can for their students. The University of Richmond has made similar commitments to "[weave responsible environmental stewardship into the fabric of the University](#)". (University of Richmond, 2018). The University of Richmond can learn from Furman who has been pursuing this commitment for some years now.

Furman has taken their commitments seriously and has even implemented an on campus farm called [Furman Farm](#). With the Furman Farm only being  $\frac{1}{4}$ , this would be a very plausible project for the University of Richmond to complete. At the Furman Farm "volunteers work with students to gain hands-on experience in sustainable agriculture and small-scale food production" (Furman University, 2018). They did not hire extra faculty to work the farm but rely on volunteers. This may be difficult to find a lot of volunteers but it is still an option instead of hiring extra faculty. Furthermore, during growing season the volunteers are able to sell their produce at Community Supported Agriculture program and farm stands on certain days. Also, some food also goes to the Furman Dining hall so they eat what they produce as well. This concept incentivizes volunteers who may not have

available space to grow fruits and vegetables while helping to teach students about agriculture and farming while being able to grow and sell crops. Furthermore, Furman University had a deal from their main energy provider, Duke Energy. Furman had what is called the [Duke Endowment Support](#) which was a grant of 300,000\$ from Duke Energy to support sustainable agriculture on campus. Everything having to do with this small campus farm and sustainable agriculture is very doable for Richmond because of all the unused and under utilized land that is available and because of how poorly Richmond's dining services are rated in sustainability. In chapter 7 in this volume there is a proposal to expand the on campus garden at the University of Richmond which would include selling food to the dining hall like Furman currently does ([Hingst](#), 2018).

Another big step Furman has taken in Sustainability is improving their on campus lake and the landscaping around it to benefit the health of the lake ecosystem. They have a project called [The Lake Restoration Program](#) with the primary focus being landscaping the shoreline in a way to control runoff, absorbs nutrients before they can enter the lake, discourages waterfowl, and increases the beauty and biodiversity of the area. The shoreline was incredibly eroded at the Furman Lake, which caused problems for the lake. There are a lot of similarities between the Furman Lake and Westhampton Lake. The University of Richmond's shoreline is eroded as well and could use some help and Richmond could take steps like Furman did with re-landscaping the shoreline. Furthermore, Furman also put in rain gardens, which are deep depressions, filled with layers of sand and gravel. Plants tolerant of drought and flooding are used to filter the water contained in the garden. After a storm event, water is held in the garden and percolates more slowly and naturally into the lake. This can be added to the Richmond initiative for more sustainability and to cleaning up the Westhampton Lake, which needs a lot of work as well. To illustrate, below are images showing the improvements Furman University has done on their shoreline.



Finally, Furman pledged to be carbon-neutral by 2026 and has already taken steps to stay on track to achieve this goal and cut down on their [energy](#) consumption. For starters, Furman replaced aging heat pumps in over 10 of their on campus apartment buildings with geothermal ground source heat pumps. They have also put an array of solar panels on their physical activities center roof, which generates 95kW of solar energy while also having multiple solar panels on their Shi Center for Sustainability building as well. Richmond has plenty of room to implement solar panels like Furman has and this is a very

realistic idea as well for Richmond to cut down on its carbon emissions and energy consumption.

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## Chapter 9.4

Callie Rountree-Jablin  
Environmental Studies 2018  
Westhampton College  
Biology & Environmental Studies Major

### Sustainability at Green Mountain College



#### PROFILE:

- Private baccalaureate college with an [online graduate](#) program. [Environmental Liberal Arts Program](#); [Honors Program](#); [Killington School of Resort Management](#)
- 457 [undergraduates](#), 255 [graduate](#) students (full and part time)
- Property: 155-acre [campus](#) that runs along part of the Poultney River and includes an on-campus [farm](#) and an off-campus 85-acre [nature preserve](#)
- Endowment: [\\$3,026,124](#) (scroll down to “Off Campus Investing through Endowment” for a snapshot of the endowment as of June 30, 2017)
- AASHE Rank/Rating: Ranked as the [third top AASHE performer](#) among baccalaureate institutions, and given a [gold rating](#)
- Most recent AASHE sustainability report: <https://stars.aashe.org/institutions/green-mountain-college-vt/report/2018-02-23/>

## Green Mountain College: A Top Liberal Arts School for Sustainability

Founded in 1834, Green Mountain College (GMC) is a small, private liberal arts college in Poultney, Vermont. GMC is religiously affiliated with the [United Methodist Church](#), but also sponsors other forms of [spiritual health](#), such as guided meditation. The college prides itself on its high rating in sustainability from a variety of organizations, including [The Princeton Review](#), [Sierra Magazine](#), and the [Association for the Advancement of Sustainability in Higher Education](#) (AASHE). According to AASHE's ranking of GMC's Sustainability Tracking, Assessment & Rating System (STARS) report, the college excels in curriculum, air and climate, and investment and finance.

Sustainability forms the foundation of the [GMC curriculum](#), earning the college the highest ranking sustainability-based curriculum in AASHE's *2017 Sustainable Campus Index*. From History to Wilderness & Outdoor Therapy, GMC offers 23 different [majors](#), all of which allow students to explore a variety of disciplines. However, these majors differ from those of many other academic institutions in that they require all students to complete a sustainability-focused general education program. This [Environmental Liberal Arts curriculum](#) is a 34- to 35-credit program designed to teach students the importance and relevance of sustainability in all fields. Of the 23 majors offered by GMC, [eight](#) are sustainability-based, and likely further strengthen the college's STARS report. GMC also values [immersive and experiential learning](#), and incorporates these principles into a classroom setting by giving students "the opportunity to take responsibility for [GMC's] shared home." As a result, most sustainability-focused initiatives on campus are developed or run by students.

Many of the student-driven sustainability efforts on campus benefit GMC's air and climate rating in AASHE's report. One of the largest student contributions was a freshmen honors seminar class idea involving an on-campus [biomass facility](#). Installed in 2010, the biomass plant heats more than 85% of GMC using local, sustainably harvested woodchips, and reduces campus oil consumption by 200,000 gallons per year. Students also helped build a [farm garage](#) that runs solely on passive solar heat, and drew attention to the college's inefficient lighting fixtures throughout campus. The school began replacing on-campus lighting with [energy efficient fixtures](#), allowing GMC to save over 322,216 kilowatt (kW) hours a year. The college also reduced emissions by [replacing windows](#), installing a solar powered electric vehicle [charging station](#), two [solar farms](#) that each produce 150 kW, a [windmill](#), and a [150 kW turbine](#) that operates in conjunction with the biomass facility. However, GMC's contribution to air and climate health does not stop here.

GMC was climate neutral as of 2011. Different from carbon neutrality, [climate neutrality](#) is based on the idea that the school "reduce[s] on-site emissions as much as possible, and then cover[s] the remaining emissions by reducing someone else's emissions somewhere else." The school is one of two climate neutral colleges in the United States, and accomplished this goal through combining the previously mentioned campus efficiency and energy initiatives with the purchase of [renewable energy credits](#) from a cow power program to support small campus buildings. In achieving climate neutrality, GMC decreased emissions by almost 30%. According to the *2017 Sustainable Campus Index*, the school tied with Colby College for second place as a

top performer in the air and climate impact area. GMC's climate neutral approach also involved complete [divestment](#) from fossil fuels in the school's endowment in 2013, likely improving the school's investment and finance rating in the AASHE report.

In addition to divestment, GMC practices other sustainable investment and finance approaches to help create a positive global net impact. With student help, GMC developed an [Environmental Guidelines for Business Partners](#) policy that encourages sustainable practices in campus business partners. In 2012, GMC created a [Green Revolving Loan Fund](#) of \$30,000 that funds efficient and sustainable on-campus projects. The fund has supported [three different student-involved projects](#): the installation of energy efficient lighting in outdoor fixtures, a solar array for the vehicle charging station, and a [transformation project](#) aimed at improving energy efficiency in a historical on-campus building. These projects provide a model for the greater Vermont community by demonstrating successful and sustainable methods that can be adopted to help improve buildings and businesses. GMC also has a [Student Campus Greening Fund](#) that is supported by a built in \$30 student college fee, and gives students the opportunity to "put greening initiatives into action." To oversee GMC's investment and improve stakeholder involvement, the college has a [Socially Responsible Investment Advisory Committee](#) that includes two student members. In the 2017 AASHE report, GMC was the third top performer in investment and finance.

Green Mountain College not only teaches sustainability, but clearly aims to practice it as well. This "[authentic sustainability](#)" mindset distinguishes GMC from many other universities across the country, and is the main focus of the school's [Sustainability 2020 strategic plan](#) that began in 2012. Compared to the University of Richmond (UR), this goal is very advanced. However, looking into GMC's AASHE impact areas that are well-ranked is still beneficial because it demonstrates how the University can improve in sustainability. In addition to curriculum, air and climate, and investment and finance practices, GMC also has other programs that may inspire Richmond, including: [Composting](#), [a Zero-Sort Recycling Program](#), [Free Store & Freepo](#), and [Cerridwen Farm](#) (see in this volume: [Jablin](#), Chapter 1; [James](#) Chapter 5; [Hingst](#) Chapter 7). Every university that strives to improve in sustainability must start somewhere, and GMC is a good model for initial projects as well as long-term initiatives at UR.

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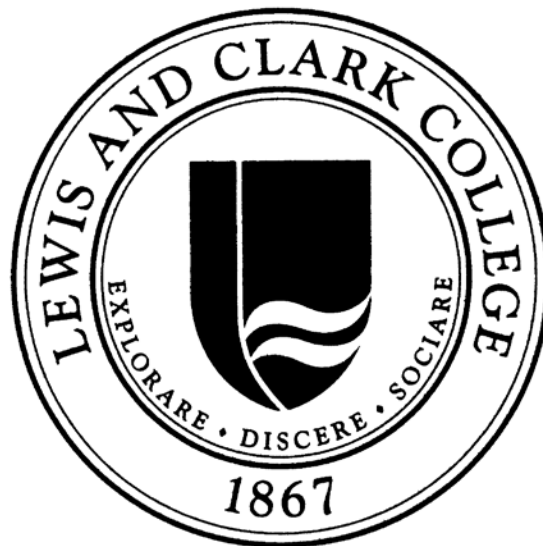


## Chapter 9.5

Mary Kate Jaromin  
Environmental Studies 2018

Environmental Studies Major, Geography and Law in the Liberal Arts Double Minor

### Sustainability at Lewis and Clark College



#### PROFILE:

- Private Baccalaureate University with some graduate programs. College of Arts & Sciences; School of Law; Graduate School of Education and Counseling ([Lewis and Clark Academics](#))
- 2,134 undergraduates, 1,285 graduate students (full and part time) ([Lewis and Clark Admissions Facts and Figures](#))
- Property: 137-acre main campus ([Lewis and Clark Admissions Facts and Figures](#))
- Endowment: \$227,730,000 ([Lewis and Clark Office of Budget and Finance](#))
- AASHE Rank/Rating: 9<sup>th</sup> out all of Baccalaureate Institutions;  
Rated AASHE **Gold** ([AASHE Sustainable Campus Index 2017](#))
- Most recent AASHE sustainability report: <https://stars.aashe.org/institutions/lewis-clark-college-or/report/2017-06-30/>



## Lewis and Clark College: Student Engagement and Environmental Understanding

Founded in the year 1867 and located in the progressive city of Portland, Oregon, [Lewis & Clark College](#) is a private, liberal arts university with a declared focus on public conscience and global reach. The school extols [four main areas of concentration](#), “Health and wellness; civic leadership and career development; diversity; and experiential learning – designed to support students’ transition to college by encouraging personal development, promoting co-curricular learning, stimulating educational success, and helping prepare students for lifelong careers.” In addition to their strong commitment to these values, as stated in their [Strategic Plan for 2020](#), the school looks to provide, “students in all three schools significant programs in environmental scholarship, education, and engagement.” This university wide focus on student engagement and understanding of the environment that is evident within the all of the programming is part of what sets the University apart from other comparable liberal arts colleges.

The University also created the [Lewis & Clark Sustainability Council](#) (LCSC) in the late 1990s, which is a group of 16 members, made up of students, faculty, and staff from the College of Arts and Sciences, the Law School, and the Graduate School of Education and Counseling. The [LCSC](#) works to, “Integrate sustainability into the life of the three Lewis & Clark schools. Doing so helps to develop cross-school collaborations, broaden our relationships with organizations and partners in the greater Portland area, promote student learning through hands-on work on sustainability initiatives, and effectively communicates Lewis and Clark’s commitment to sustainability.” The [LCSC](#) serves as a bridge between the three schools and plays a major role in the implementation of sustainability and environmental education initiatives, the ability of student participation is also a unique opportunity to experience the administration of school programs.

The [Association for the Advancement of Sustainability in Higher Education](#) (AASHE) created the [Sustainability Tracking, Assessment & Rating System](#) (STARS), as a way to track and measure the sustainability performance of colleges and universities through self-reporting. As of June 2017, under [STARS](#), Lewis & Clark has a score of 68.60, which has earned the college a gold rating and captured there spot as one of the top ten universities for sustainability performance. Lewis & Clark excels in the area of [Academics](#), earning high scores for academic courses (10.16/14.00), Campus as a Living Laboratory (4.00/4.00), and research and scholarship (8.17/12.00). However, there is some room for improvement in this section, as the college chose not to pursue credit for [learning outcomes](#), and received a 0/8.00. The University also does well in the areas of Campus and Public Engagement, with scores of 11.88/21.00 and 13.25/15.00, respectively. Under the category of [Air & Climate](#), the school does exceptionally well earning a 9.50/10.00 for [greenhouse gas emissions](#), and 1.00/1.00 for indoor air quality. This high score for greenhouse gas emissions can be explained in part by the student led [Green Power Initiative](#). Through this program approximately 95% of the College of Arts and Sciences students have voluntarily contributed \$20 each in annual fees for the purchasing of Renewable Energy Certificates (RECs) and other carbon offsets. The program has

raised not only enough money to cover 100% of the universities scope 1 and scope 2 greenhouse gas emissions, but also enough money to create their [Renewable Energy Fee Fund](#). This fund is used to award grants to students that are interested in conducting research projects on renewable energy and sustainability. The University's emphasis on student engagement, global consciousness, and environmental stewardship has fostered an environment in which students have the desire, the drive, and the ability to create change and take action on campus.

When comparing the STARS performance of Lewis & Clark to the University of Richmond (U of R) there are a few areas worth noting. When looking at the STARS category of academic offerings, [Lewis & Clark](#) (10.16/14) has a higher score than [U of R](#) (5.22/14), but Lewis & Clark includes internships, practicums, independent study, clinical, and physical education in their sustainability courses, while U of R does not. The inclusion of these categories into the overall [academic offerings](#) section could be a simple way for U of R to gain points in this category without making any changes to current curriculum. Much like the [general education requirements](#) at U of R, Lewis & Clark does not have an environmental or sustainability component to their [general education requirements](#), but the school goes a step further than U of R with the administration of a [sustainability interest and literacy questionnaire](#) that is administered to the entirety of the freshman class. The survey not only covers environmental sustainability, but also asks questions on corporate and social sustainability, and the bottom section is dedicated to gather information on student interest in sustainability in general, but also on-campus sustainability classes, initiatives, programs, and activities. The collection of this data would be very helpful at U of R because it would make it possible to understand how incoming students value sustainability, whether or not they even understand it, and what types of programs and classes they would be interested in signing up for.

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## Chapter 9.6

Harleen Bal  
Environmental Studies 2018  
Majors: Environmental Studies and Healthcare Studies

# Sustainability at the Middlebury College



### PROFILE:

- Private small Baccalaureate University founded in 1800 in Vermont
- Founded the International Quidditch Association and hosts the oldest annual Winter Carnival ([Middlebury Quick Facts](#))
- Approximately 2,500 undergraduates ([Middlebury Quick Facts](#))
- Property: 350 acres ([U.S. News](#))
- Endowment: \$1.073 billion ([U.S. News](#))
- [AASHE 2017 Rating/Rank](#): **GOLD** ranked **2<sup>nd</sup>** most sustainable baccalaureate school
- Most recent AASHE sustainability report:  
<https://stars.aashe.org/institutions/middlebury-college-vt/report/2017-06-09/>

## Middlebury College: Paving the Way Forward for Sustainability

Middlebury College is a private liberal arts college with an undergraduate student population of approximately 10,000. The college, situated in a rural setting, was founded in 1800 and takes up an area of 350 acres. Interestingly, Middlebury College has an endowment of over one billion dollars and is not religiously affiliated. Overall, Middlebury is a top liberal arts college in the U.S., along with being a high performer on AASHE's list of institutions.

Perhaps most notable is Middlebury's commitment to carbon neutrality, which is reflected in Middlebury's Operations ratings on AASHE's report. Specifically, Middlebury reached [carbon neutrality](#) in December, 2016, a major achievement industriously reached by the University over the course of 15 years. Initially, Middlebury created a goal of reducing greenhouse gas emissions by 8 percent by 2012. However, in 2006, it became evident that the college could easily attain the goal, due to a [biomass gasification plant](#). A group of ambitious students brought a proposal to the president, Ron Liebowitz and introduced the goal of attaining carbon neutrality by 2006. The president subsequently decided to give the students support, connected the students to the Board of Trustees, and eventually implemented the challenging goal. Middlebury is the first school of substantial size to achieve [carbon neutrality](#) in the U.S. This is an example of how Middlebury's initiatives often involve student impetus for change, one that perhaps we could utilize more at the University of Richmond.

Another unique initiative by Middlebury is its usage of biomass through biomass gasification, which was officially launched in February, 2009. Middlebury's biomass gasification plant uses locally sourced wood chips from the forests of Vermont to New York, which utilizes steam that can be used across campus. The [biomass gasification](#) plant saves more than 1,000,000 gallons of fuel each year. Middlebury has also established a 1.5 acre solar farm serving two purposes as an energy harnessing area and a recreational area on which people can take nature walks or exercise. Middlebury also invested in a [wind turbine](#) at the Middlebury College Snow Bowl, its ski resort, covering about 15% of the electrical needs of the building.

Middlebury has also taken strides to becoming more sustainable through [gardening](#) and farming. Fifteen years earlier, Middlebury established a garden plot on the western border of its campus. On this plot, the developed garden plots, outdoor classrooms, garden sheds, etc. The Knoll, as it is fondly called, has grown vastly and is now home to several educational gardens, a pizza kitchen, and a serenity garden. Middlebury also holds a [nine-week program](#) during the summer that focuses on learning about food systems. The leadership program takes on both academic and experiential aspects while students learn about the food landscape in Vermont.

It is important to note that Middlebury has taken a strategic, powerful step by developing its [2008 Master Plan](#), and subsequently, its Sustainable Design Guidelines. The Master Plan outlines how Middlebury strives to develop over the next 50 years, with particular emphasis on [sustainability](#), while the Sustainable Design Guidelines implement [specific building standards](#), such as all buildings meeting a minimum of LEED Silver standards.

Middlebury signed a [conservation easement](#) in 2015, which established 2,100 forested acres to be permanently protected for public benefit by signing the land over to the Vermont Land Trust. This step, not only set aside more land and assistance to meet the carbon neutrality goal through forest carbon sequestration, but it also allowed students to utilize the land for activities and recreation, such as skiing. Similarly, UR's "Ball Park" property was the first conservation easement in the Commonwealth of Virginia (1967), but it is quite small being only 104 acres. However the land has not been utilized since. UR acquired another 109 acres (Pagebrook), but have chosen not to do any kind of conservation easement with that property. Perhaps Middlebury's

Lastly, Middlebury's Environmental Studies major is quite a robust [program](#); indeed, the major has several foci or areas of focus, such as conservation biology, environmental chemistry, conservation psychology, and many others. Middlebury was the first college in the U.S. to offer a degree in [environmental studies](#), a detail that reflects Middlebury's tendency to be ahead of the curve when it comes to sustainability. Environmental awareness was only beginning to ramp up in the early 1970's in the U.S., and Middlebury had already taken steps towards environmental education. The foci allow students to become well-versed in a particular area of environmental studies, which then allows them to engage with other concentrations and majors, each bringing a specialized knowledge angle to major issues.

The University of Richmond parallels Middlebury in several ways. Firstly, UR has a fairly similarly sized student body, meaning the initiatives that are spear-headed by Middlebury align with the sort of initiatives we could possibly catalyze as an institution. Additionally, although our goal of attaining carbon neutrality by 2050 is on a much different time-scale and projection, the biomass gasification plant introduces the notion that we may need to invest in certain large-scale, major energy shifts in order to make strides towards our goals. One of these mechanisms could be a large solar array, as mentioned in our class and lectures, or perhaps investing in biofuels.

While Middlebury has taken swift, large strides on the path of sustainability, UR represents a similar student body and size as Middlebury in the past, perhaps a few decades prior. For that reason, it is quite reasonable that while our initiatives may be behind those of Middlebury's, we are likely headed in the same direction. Middlebury has a slightly smaller endowment than the University of Richmond and is consistently ranked within the top ten liberal arts institutions in the U.S., along with ranking in the top universities when it comes to sustainability; perhaps this is not a mere coincidence. A healthy sustainable campus likely lends itself to a healthy, engaged academic student body. Given our resources and potential, the University of Richmond should strive to improve our practices when it comes to sustainability, and in doing so improve the health and impact of our campus on our community. Depending on student culture and the University's mission, along with strategic plans and overall push from faculty, students, and administrators to invest in sustainability, we could strive for initiatives such as expansion of the community garden, solar arrays, and biofuels.

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## Chapter 9.7

Caroline Jones  
Environmental Studies 2018  
Westhampton College  
Environmental Studies and International Studies Majors  
Latin American Latino and Iberian Studies Minor

### Sustainability at Oberlin College



#### PROFILE:

- Undergraduate college of arts and sciences and a professional school of music: includes the College of Arts and Sciences (divided into Arts and Humanities, Mathematics and Natural Sciences, and Social Sciences) as well as a Music Conservatory ([Mission and Values](#))
- Nearly 3,000 undergraduate students, 2,300 of which are Arts and Sciences students ([College at a Glance](#))
- Property: 440-acre campus, 70-acre George Jones Memorial Farm and Nature Preserve, 12-acre Ladies' Grove and 77-acre Arboretum ([AASHE 2017](#)).
- Endowment: Approximately \$753,500,000 as of 2016 ([Assets Under Management](#))
- [AASHE 2017 Rating/Rank](#): **GOLD** ranked 6<sup>th</sup> most sustainable baccalaureate school
- Most recent AASHE sustainability report: <https://stars.aashe.org/institutions/oberlin-college-oh/report/2017-03-09/>.



## Oberlin College: Committed to Strategic Sustainability and Carbon Neutrality

Oberlin is committed to achieving carbon neutrality by 2025, and many of the College's sustainability programs, run by the Office of Environmental Sustainability, are geared towards this goal. Oberlin's Office of Environmental Sustainability [website](#) states that "The Office of Environmental Sustainability (OES) works to facilitate the implementation of the college's comprehensive environmental policy in line with the college's strategic goal of sustainability and commitment to carbon neutrality." [It explains](#) that OES works with students, faculty and staff, the administration, and the off-campus community to improve the "environmental performance" of Oberlin by raising awareness and developing tools to respond to campus, local, and national environmental issues. The OES [employs numerous paid student workers](#) each year to assist with its work, which encompasses social, ecological, and economic sustainability.

The OES has [a number of programs](#) to reduce resource consumption on campus, including Ecolympics, the Green Office Program (GOPro), Community Based Social Marketing (CBSM), the Sustainability Map, and Car Sharing. Ecolympics aims to reduce water and electricity use on campus each year, and includes a community event series focused on these (and other sustainability-related) topics. GOPro seeks to reduce energy consumption in offices, and CBSM uses empirically-based behavior change programs, both as a part of Oberlin's commitment to achieving carbon neutrality. The Sustainability Map provides a guide to sustainability initiatives on Oberlin's campus, and the Car Sharing program created a transportation option for the on and off campus community that is more sustainable and efficient than many alternatives.

The AASHE STARS program has rated Oberlin a [Gold Level school](#). Oberlin scores particularly well in Campus and Public Engagement, Water, Grounds, Coordination, Planning, and Governance, and Diversity and Affordability. The [Public Engagement category](#) received 17.84 out of 20 points (due to efforts such as partnerships with the Climate Positive Development Program, a joint initiative of the Clinton Climate Initiative, as well as the U.S. Green Building Council). Community Partnerships, Inter-Campus Collaboration, Community Stakeholder Engagement, Participation in Public Policy, and Trademark Licensing all received 100 percent of points within the Public Engagement category.

Under the [Campus Engagement subcategory](#), the Student Educators Program, Student Orientation, Student Life, Outreach Materials and Publications, Outreach Campaign, Employee Orientation, and Staff Professional Development all received 100 percent of the possible points, for a total score of 17 out of 20 points. The [Student Orientation section](#) is important to note: Oberlin's STARS Report explains that "Sustainability is a large focus of new student orientation...A key orientation event is the Office of Environmental Sustainability's "Green Orientation." Also, Oberlin hosts zero-waste and locally-sourced meals for new students during orientation, and has a Resource Conservation team that promotes recycling and reuse.

In the [Planning and Administration category](#), Oberlin received all available points for the Coordination, Planning, and Governance subcategory (which includes Sustainability Coordination, Sustainability Planning, and Governance). In the Diversity and Affordability subcategory, Diversity and Equity Coordination, Assessing Diversity and Equity, Support for Underrepresented Groups, and Support for Future Faculty Diversity also received 100 percent of the points. In the Health, Wellbeing and Work subcategory, Employee Compensation and Wellness Program fared well, while Assessing Employee Satisfaction and Workplace Health and Safety did not. Their [Wellness Program](#), though, did not mention that sustainability is part of it. In the Investment subcategory, Committee on Investor Responsibility received all points, but Sustainable Investment and Investment Disclosure did not fare as well (1.34 out of 4 and 0 out of 1, respectively).

In the [Operations category](#), Water received 5.88 out of 6 points for Rainwater Management and Water Use. Grounds received 1.49 out of 2 points, and Biodiversity received 2 out of 2 points. A big part of the Biodiversity score, according to STARS, is related to the properties that Oberlin owns and manages for sustainability, nature, recreational, and educational purposes. According to the STARS Report, the total campus area is 614 acres, with 80 acres of undeveloped land (excluding any protected areas). Oberlin owns [two properties](#) beyond its main campus, including the 70-acre George Jones Memorial Farm and Nature Preserve (The Nature Preserve) and the 84-acre Arboretum. The function of The Nature Preserve is described vividly in the [STARS Report](#): “At the crossroads of organic food, environmental restoration, and social justice, [the Nature Preserve] is a vibrant space for students and the community to come together to create a sustainable food system for Northeast Ohio and beyond.” The Nature Preserve is clearly an important multi-use property in terms of Oberlin’s sustainability efforts that engages both the campus and off-campus communities.

The Arboretum, on the other hand, is heavily used for recreational and academic purposes. The [STARS Report](#) includes a description of its uses: “Varied academic departments—biology, rhetoric, environmental studies, and photography, to name a few—use the Arboretum to collect data and have field lessons.” This property, which is on the southernmost part of campus and has trails and creeks, is another major asset to Oberlin’s environmental and sustainability efforts, especially since they engage a wide array of students, faculty, and community members in many ways—from academics, to recreation, to research.

Oberlin also offers 52 [sustainability-related courses](#) in a diverse array of fields such as Anthropology, Biology, Chemistry, Economics, English, Environmental Studies, Math, and Political Science. But, like UR, [Oberlin does not require](#) that students take a sustainability course before graduating. According to STARS, University of Richmond is a [Silver Level school](#), but there are certain areas where we excel against Oberlin. We surpass Oberlin in the Diversity and Affordability subcategory (under the Planning and Administration category), with a score of 9.54 out of 10 over Oberlin’s 8.99. We also do slightly better in the Health, Wellbeing and Work subcategory than Oberlin does. In the Academics category, UR passes Oberlin by over two

points for the Research subcategory. That said, to become a Gold Level institution like Oberlin, UR has some major catching up to do.

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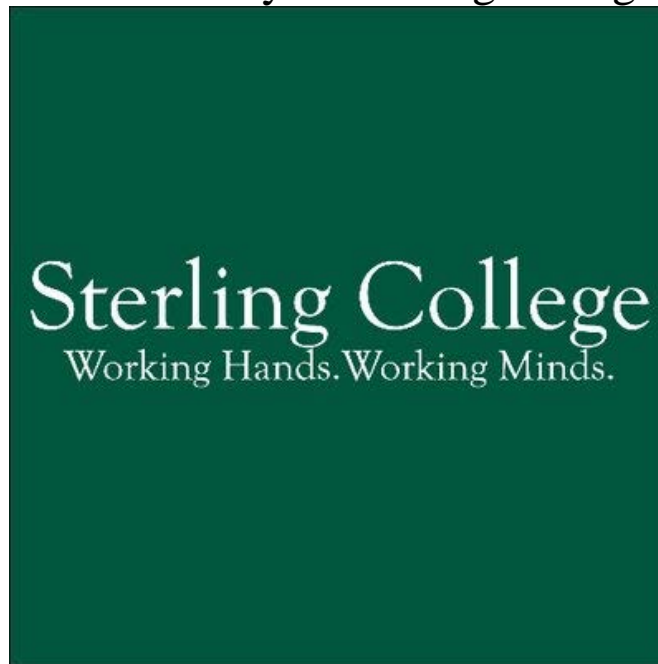
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## Chapter 9.8

Quinn Eger  
Environmental Studies 2018  
Westhampton College  
Environmental Studies Major

### Sustainability at Sterling College



#### PROFILE:

- Private Baccalaureate College.  
Majors: Ecology, Environmental Humanities, Outdoor Education, Sustainable Agriculture, Sustainable Food Systems, or Self-Designed Major (Sterling College Academics 2017-18)
- 125 total undergraduates and students (Sterling College, 2018)
- Property: 130 acres for main campus, plus the campus farm (5 acres of garden, 20 acres of pasture, and 390 acres of forested land). (Sterling College, 2018).
- Endowment: \$1,100,000 (Sterling College Strategic Plan 2017)
- [AASHE 2017 Rating/Rank](#): **GOLD**, ranked **#1**: the most sustainable baccalaureate school!
- Most recent AASHE sustainability report: <https://stars.aashe.org/institutions/sterling-college-vt/report/2017-01-26/>

## **Sterling College: Student Involvement the Secret to Top Performance in Sustainability Innovation**

Nestled in a small town in rural Vermont, Sterling College acts as an ecological oasis, setting the bar high for sustainability and environmental stewardship. With only 125 students and 45 faculty members, the small and environmentally-driven community is able to accomplish what most universities can only dream. Sterling College is the current overall top-performing Baccalaureate Institution for sustainability, as assessed through AASHE's STARS program. The main criteria that sets Sterling apart from other institutions are energy, curriculum, and dining. The true inspiration that Sterling College provides, perhaps, does not derive from the STARS ranking system, however exhaustive: the secret to Sterling College's successes in sustainability can be explained through the impassioned student involvement behind the scenes.

Sterling College is featured on the AASHE's 2017 sustainability report for their incredible [13 solar trackers that produce 80% of the college's energy needs](#). These solar panels move with the sun and are expected to soon produce 100% of Sterling College's energy. According to Rohit Fenn, an alumnus from Sterling College who was very involved in the STARS survey, Sterling College also has plans to work on sustainable heating fuels for the campus soon (Fenn, 2018 pers. comm). Sterling College was also the [first college in Vermont and the third college in the United States to divest their endowment from fossil fuels](#). The college also has [two barns](#) that are powered by solar panels and a wind turbine. [Jaromin](#) (2018, Chapter 4 in this volume) makes a compelling argument for the University of Richmond to implement a solar array on one of the university's land holdings.

Sterling College is also ranked third for curriculum achievements. Out of 200 classes offered at Sterling College, [130 classes are considered overt sustainability courses, with an additional 20 classes considered to have a sustainability focus](#). Sterling College offers [five majors](#) or the option for a self-designed majors. The majors include ecology, environmental humanities, outdoor education, sustainable agriculture, and sustainable food systems.

Lastly, AASHE celebrates the Sterling College sustainable dining system. Ranked number one, Sterling College utilizes local food, an on-campus farm, and a wide variety of vegan and vegetarian meals. Nicole Civita, the director of sustainable food systems at Sterling College, describes that around [20% of the food eaten on campus is produced at the campus farm](#). [The farm is 5 acres of garden, 20 acres of pasture, and 390 acres of forested land](#). It houses hogs, sheep, laying hens, and more. The man power for the farm is provided by the college's draft horses. No pesticides or chemical fertilizers are used. Furthermore, following the "Real Food Challenge" standards, 76% of Sterling College's food is real food, making [Sterling the top-rated "Real Food Challenge" college in the nation](#). By comparison, the University of Richmond's real food analysis showed that only [3.2% of our food items qualify as real food](#). Around 20% of meals served to the entire community are vegetarian/vegan, and there are always vegetarian and vegan options available. Sterling Farm also participates in a CSA (Community Supported Agriculture) during the summer and fall months, offering shares to students and faculty. [Hingst](#) (2018, chapter 7 in this volume) proposes that the University of Richmond should expand its farm and develop a CSA program.

Perhaps Sterling College's greatest achievement comes from the degree of student involvement on campus. Students are the greatest drivers of sustainable thinking and implementing ideas on campus. The college does not have one sustainability director, "because we expect every person in our community to be [pushing for more sustainable and ecologically sensitive choices](#)." Rohit Fenn, alumnus of Sterling College, says that student involvement plays an integral part in Sterling's sustainability successes. Rohit explains that Sterling College is one of seven federally-recognized "[work colleges](#)," meaning every single student has an active role and job on campus. Some examples of these jobs described by Fenn include 'Captain compost' who turns the compost pile and transports it to the gardens, the forestry crew that is sustainably harvesting timber for sugaring operations, or teaching assistants who try to bring in as much new and relevant sustainability data research to classes. On describing the involvement that students play in Sterling College's drive to be an example of environmental stewardship, Rohit described students as being an integral part of the school's decision-making (Fenn, 2018 pers. comm). Being highly involved in the campus through the jobs they perform allows students to envision opportunities to make the school even more environmentally-friendly. Unlike any other school in the nation, the entire campus community meets once a week for the [Community Meeting](#); this is a place where students can voice their ideas.

While Sterling College has been a leader in college sustainability, there is always room for improvement. Hoping to serve as a model of what colleges can accomplish, Sterling College continually works to increase their environmental stewardship. Rohit Fenn discusses how the main areas of improvement are in organization and documentation, as with most schools (Fenn, 2018 pers. comm). With so many different parts of the college working individually to develop new sustainable projects, it is important to communicate across the entire campus and stay organized in order to increase efficiency. While no college is perfect, Sterling College provides an excellent model of a school that prioritizes sustainability. Sterling College serves as a goal for other schools, like the University of Richmond, to reach towards.

#### **Sources:**

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Specifics into Sterling's top successes:

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Sterling College's individual STARS report:

<https://stars.aashe.org/institutions/sterling-college-vt/report/2017-01-26/>

Sterling Strategic Plan

<https://sterlingcollege.edu/about-sterling/our-president/strategic-plan/>

Sterling College's website:

<https://sterlingcollege.edu/>

Sustainability/Environmental Stewardship website:

<https://sterlingcollege.edu/environmental-stewardship/>

## Sustainability at the University of Richmond



### PROFILE:

- Private Baccalaurate University with some graduate programs. School of Arts & Sciences; School of Business; School of Law; School of Leadership Studies; School of Professional and Continuing Studies (University of Richmond Factbook 2016-17)
- 3254 undergraduates, 877 graduate students (full and part time) (University of Richmond Factbook 2016-17)
- Property: 350 acres for main campus, plus two additional holdings of 100+ acres of undeveloped land. (Office of Sustainability, 2016; Moyer 2018, pers. comm).
- Endowment: \$2,344,548,000 (University of Richmond Factbook 2016-17)
- AASHE Rank/Rating: currently not ranked. Rated AASHE Silver (AASHE 2017)
- Most recent AASHE sustainability report:  
<https://sustainability.richmond.edu/goals/reports/Sustainability%20report%20february%202017-%20for%20web.pdf>