Teaching the Future: Academic Infusion of Sustainability at Emory

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Introduction

Sustainability is no longer an elective. It is a prerequisite.
–David Skorton, former President of Cornell University (in Sharp and Shea 2012)

Successfully instilling higher education with sustainability issues is becoming more urgent as universities realize their responsibility to set an example for the rest of society. Global climate change is a universal issue of rising importance that will need to be solved by the young leaders attending universities today. Students, staff, and faculty of Emory University have increasing opportunities to participate in interdisciplinary classes, research projects, and co-curricular groups all with the goal of furthering sustainability-related knowledge and practices at Emory. The past seventeen years have seen a dramatic increase in the organization and accessibility, as well as the abundance of these academic resources. But until recent years when a controversial road intersecting Lullwater Preserve was built in the summer of 1999, there was no organized sustainability community at Emory. After the construction plans were altered to cause less environmental harm, the interest from students and faculty in learning more about sustainable practices at Emory and in the global community remained. From humble beginnings with a few faculty members who organized regular lunches to connect educators from diverse fields, the sustainability in academics movement has grown to encompass a nationally-known faculty development program, an interdisciplinary sustainability minor, and dozens of course offerings across all the university's schools, among other achievements. This history will encompass:

- Faculty Green Lunches
- Piedmont Project and TATTO
- Faculty Advisory Council for OSI
- Sustainability Minors and Credentials
- Piedmont II Workshop
- Continuing Education Certificate
- Sustainability at Oxford and the Oxford Organic Farm
- Research Nodes
- Spotlight sections on Nursing curriculum and two of many sustainability-related classes: the Sustainable Food Fair and the Interdisciplinary Water Classes

Though Emory still faces challenges infusing academics with sustainability, interactions among various faculty and students regarding interdisciplinary ideas and environmental concerns have become commonplace. Emory's current leadership in academic infusion of sustainability is a direct result of years of commitment and progress from key leaders and groups in the university's community, whose expertise was also instrumental in shaping and now recording this history. The Talloires Declaration, which stemmed from a gathering of university presidents in France, explains why it is essential for Emory and all universities to continue making sustainability a pillar of education. Though the convention took place in 1990, it still rings true that "universities educate most of the people who develop and manage society's institutions. For this reason, universities bear the profound responsibilities to increase the awareness, knowledge,

technologies, and tools to create an environmentally sustainable future" (University Leaders for a Sustainable Future 1990).

Methods

This Report was written in spring of 2017, as part of the course Writing Emory's Sustainability History (ANT 385W) taught by Dr. Peggy Barlett. It builds on four Reports completed in 2008:

- The Sparks of Sustainable Energy: Sustainable History at Emory (Mona Patel)
- Constructing a Movement, One Building at a Time: The History of Green Buildings at Emory University (Micah Hahn)
- Alternative Transportation (Andrew M. Foote)
- "Going Into a Place of Beauty": Forest Preservation and Restoration (Whitney Easton)

Our 2017 class chose eight sectors of action for research and interviews, to contribute to the oral and written history of sustainability efforts at Emory. The seven other topics are:

- Institutionalization of Change: A History of Emory's Office of Sustainability Initiatives (Kristen Kauffman)
- Carbon, Climate and Co-Generation: A History of Emory's Energy and Climate Commitments (Katelyn Boisvert)
- Greenspace at Emory: Finding the Balance (Orli Hendler)
- Sustainability in Campus Life: The Changing of Behavior (Jamie Nadler)
- Sustainable Healthcare at Emory University (Lauren Balotin)
- Emory's History of Waste Diversion and Recycling (Amelia Howell)
- Stormwater Management and Water Conservation at Emory University (Kelly Endres)

This Report was based on written materials, available quantitative and qualitative data, and interviews. Background information was obtained from the Emory Report, the Emory Office of Sustainability Initiatives website, publications about the Piedmont Project available online and in books, documents such as the Sustainability Minor Proposal, and various websites in Emory's network. Interviews were scheduled via email, and in the revision process, interviewees were given the chance to review the document and provide feedback. We are especially grateful to interviewees for sharing their time and insights with us, and also to Ciannat Howett and other members of the Office of Sustainability for their generous help in constructing these histories. The individuals interviewed for this Report are listed below, with the date of interview:

- **Peggy Barlett:** Professor of Anthropology, Director of Piedmont Project, Faculty Liaison to Office of Sustainability Initiatives (OSI). a: 2/8/17, b: 3/28/17, c: 4/6/17
- **Arri Eisen:** Professor of Biology, Director of Science and Society Program, former Co-Director of Piedmont Project. 4/3/17
- **Hilary King:** Sustainability Graduate Student Fellow. 2/20/17
- **Simona Muratore:** Italian Professor. 2/16/17
- **Karen Stolley:** Spanish Professor, former Co-Director of Piedmont TATTO, Piedmont II. 2/22/17

- **Theodosia Wade:** Biology Professor at Oxford College. 2/18/17
- **Kelly Weisinger:** Sustainability Programs Coordinator at OSI. 2/27/17

Timeline

1980s-Human and Natural Ecology interdisciplinary program founded in Emory College, linking natural and social sciences in a co-major with strong experiential learning component.
1990- Emory's School of Public Health opens and Environmental Health Program founded.
1995- Environmental Law program in the Emory Law School creates specialization for students.
1998- Turner Environmental Law Clinic begins preparing students for law careers with experience working on important cases in the southeast US.
1999- Environmental Studies Department founded in Emory College.
Fall 2000- Regular Faculty Green Lunches begin, bringing together like-minded educators from nearly all of Emory's schools.
May 2001- First session of the Piedmont Project conducted by guest facilitators from Northern Arizona University, Geoffrey Chase and Paul Rowland, designed to help faculty develop interdisciplinary classes incorporating sustainability. The Piedmont Project has been offered most years since 2001.
May 2003- Barlett and Eisen take over leadership of the Piedmont Project for the first time.
May 2004- Piedmont Project expanded to include separate graduate student workshop and syllabus-development fellowship called Piedmont Teaching Assistant Training and Teaching Opportunity.
Fall 2006- Barlett becomes first Faculty Liaison to the Office of Sustainability Initiatives.
April 2007- First Sustainable Food Fair organized by students in Fast Food/Slow Food anthropology class.
Fall 2010- Sustainability Minor offered for the first time as a result of student interest and faculty support from multiple disciplines.
Fall 2010- Faculty Advisory Council to OSI is formed: first meeting occurs February 2, 2011.
Fall 2011- Faculty workshop, Piedmont II, explores next steps for academic development.
2011- STARS survey of faculty reports 12% of undergrad classes at Emory feature content related to sustainability.
Fall 2011-spring 2015- Sustainability: Life in Balance academic theme at Oxford College brings together multiple faculty with interests in sustainability to create and offer new courses.
Fall 2013-Sustainability Sciences minor created in Environmental Sciences Department; Environment and Sustainability Management Concentration in connection with the Goizueta Business School also offered to undergraduates.
Fall 2014- Grand opening of Oxford Farm near Oxford campus, providing opportunities to connect academics with hands-on learning.
November 2015- Delegation of Emory students and professors attends the 21st Conference of the Parties, where the Paris Climate Agreement is established.
Fall 2016- Sustainability Faculty Advisory Council doubled to accommodate increased interest and new research nodes.
Fall 2016- STARS survey of faculty reports 328 classes related to sustainability issues and 96 classes that use the campus as a living laboratory.

Faculty Green Lunches

Beginning in the spring of 2000, as an outgrowth of the Ad Hoc Committee on Environmental Stewardship, a series of Faculty Green Lunches brought faculty together from most of Emory's schools over a shared interest in sustainability. The lunches continued three to four times each semester for seven years, focusing on short presentations by faculty and starting interdisciplinary discussions around sustainability. A group of 50 to 75 attended occasionally, with ten to 25 in a typical gathering. The most popular lunch topics, teaching dilemmas and green building tours, drew more (Barlett and Eisen 2002:63; Barlett 2017b). Also in 2000, the steering committee of the Faculty Green Lunches investigated how to implement a faculty development project in order to increase the number of environmentally focused courses and build further connections between professors and disciplines. Faculty Green Lunches provided the first platform for interdisciplinary sustainability discourse at Emory, serving as the impetus for the curriculum development program subsequently named the Piedmont Project.

As well as brainstorming about ongoing issues, the Faculty Green Lunches focused on strengthening connections between different disciplines on a personal level. To allow diverse faculty and library staff in attendance to get to know each other better, every lunch began with a question, such as "What was something interesting you learned recently?" These opening queries, "signal that all voices are welcome in the group, that hierarchical posturings can safely be left aside, and that the whole person can be shared," rather than just the professional aspects of one's persona (Barlett 2017b, Barlett and Eisen 2002:63). Dr. Arri Eisen, a Biology professor who also directs Emory's Science and Society Program, helped facilitate the green lunches in their earlier years. He reports that "any activity that pulls faculty out of their silos and brings them together" fits the model that Science and Society has established, but that the Faculty Green Lunches were different because of the faculty's "personal investment" in the topic instead of only academic interest (Eisen 2017). The faculty who attended each had a personal connection to sustainability, and the lunches were an occasion to "let their personalities come out," so there was no "champion," only "faculty learning from each other" in an enjoyable environment (Barlett 2017b).

Piedmont Project and Piedmont TATTO

In May of 2001, with the assistance of the experienced leaders of the Ponderosa Project at Northern Arizona University, Arri Eisen and Peggy Barlett launched the first session of the Piedmont Project. After the first two years, Barlett and Eisen continued the Project, running it on their own for multiple years. The Piedmont Project is a two-day faculty development workshop, funded at first by curriculum development funds as well as Science and Society, and later by all Emory deans of academic units. Barlett was inspired to start the Piedmont Project after attending the Ponderosa Project, which was the most progressive faculty development workshop at the time, where she sensed a need for a similar peer learning opportunity for faculty at Emory (Barlett 2017b). Emory faculty and occasionally administrators or librarians apply to the workshop in order to develop a new course or add a unit to an existing course.

The Project has been successful because of its principles, which can easily be transferred to any new sustainability-related curriculum development program (Barlett and Chase 2012:16):

1. Foster creativity by showing that "no one area of the curriculum 'owns' sustainability."
2. Emphasize faculty expertise instead of introducing all new material.
3. Build faculty networks with small group discussions, which encourage peer learning.
4. Encourage an interdisciplinary approach, meaning faculty must "co-learn" with students about subjects they have not specialized in.
5. Welcome diverse pedagogical approaches such as shifting the paradigm of a course to focus on sustainability instead of only adding additional readings. [See Nursing Curriculum]. Encourage experiential learning.
6. Make connections among individuals and across disciplines so students in courses have the opportunity to examine sustainability with a different lens.
7. Focus on learning outcomes gained from a student's whole education, such as learning the skills to take leadership roles in bringing about a more sustainable future.

Over two days in May, the 20 Piedmont faculty participate in small and large group discussions, campus nature walks, and short lectures from experts on local sustainability issues in order to find inspiration. Then, they develop their new course material over the rest of the summer. At the conclusion of the summer, the cohort reunites to share their newly developed courses or modules. At the beginning, the Piedmont Project faculty asked for another follow up meeting and the cohorts reunited at a dinner the following spring to discuss "how the new courses went and the impact of the project on professional perspectives, teaching methods, and other issues" (Eisen and Barlett 2006:27). For financial reasons, this dinner meeting was discontinued in later years. The Piedmont Project supported the expansion of sustainability in academics at Emory across a broad range of fields.

> A 2008 survey of 1100 faculty in all units except Medicine revealed that 34 out of 43 Emory departments have at least one course related to sustainability (79%). The 2006 study found that most new or renovated courses were still being taught, and 40% of faculty reported changing not one course, but two, three, or four. Intellectual excitement from a modest change in one course often led to much larger innovations. In teaching methods, faculty reported not only adding new readings, but adding new labs, homework, or research projects (44%), developing a new unit or module (64%), or reorienting the course with a new paradigm (34%) (Sustainability Minor Committee 2009).

By connecting diverse faculty around the cause of sustainability, the Piedmont Project is able to "use Emory's diversity of expertise to [its] advantage," so that all students have the opportunity to learn from environmentally conscious professors (Eisen and Barlett 2006:26).

Barlett and Eisen agree that an advantage of the Piedmont Project has been that it fosters a sense of place in faculty. Many Emory faculty and students are not from this area, and Barlett noted that the woods walks led by Professor Eloise Carter, in addition to presentations about local issues, fostered excitement about the area in which they are now living and teaching (2017b). Barlett reported that the time spent outdoors during the workshop viewing "local flora, the

damage of invasive species, and water pollution issues" is important to building a sense of place. Once the faculty developed this interest in Emory as a place, she felt that their environmental knowledge was stronger, but more importantly, the connections among the faculty were deepened (Barlett 2004:78). Eisen also believes that at universities such as Emory, where most students and faculty do not come from nearby, people should begin to consider the place they live as an important part of their lives. Karen Stolley, a professor of Spanish who participated in the Piedmont Project in 2011 and later helped lead the Piedmont TATTO as well as Piedmont II, agrees that the field trips and walks on campus were the most memorable part of the workshop for her. She reflected that "the things we think we don't have time for," such as informative walks around campus and taking a moment to be silent, "are actually the very things that will sustain and renew us" (2017). She said that the walks made her stop and think of campus in a different way, and that she began "to rethink [her] teaching in that context [of place]" (Stolley 2017).

Figure 1. Piedmont Project participants on a woods walk led by Eloise Carter. (Barlett)

Figure 2. Small group discussions help facilitate peer learning. (Barlett)

Participants are usually knowledgeable about and interested in sustainability, but prior to the workshop, they prepare by reading articles about a variety of topics. "The goal of Piedmont Project readings has been less to bring faculty to familiarity with environmental literacy than to stimulate the imagination around possible issues that might connect with each person's field" (Barlett and Rappaport 2009:75). The thought-provoking readings are a precursor to the environment of the workshop, which encourages collaboration and ideation.

A challenge to the success of the Piedmont Project in the long term has been faculty turnover. Though the participants develop their courses for use at Emory, often they move on to other universities. They may continue to teach sustainability issues, but Emory students and faculty networks no longer benefit from the interdisciplinary knowledge gained from the Piedmont Project. By 2016, one third of the 237 faculty who had participated in the Piedmont project were no longer teaching at Emory. Barlett explains:

> The attrition in the ranks of Piedmont Project alums has slowed the momentum of several key initiatives that have been proposed. For example, of 18 faculty who volunteered to be involved in the Sustainability Minor Steering Committee in 2009, 10 have retired or left Emory, and of the remaining 8, two are in transition out of Emory and 3 are only teaching part-time. Of course, new faculty have been recruited to serve the Sustainability Minor, and transitions of Piedmont faculty into administrative positions only spreads understanding of sustainability issues, but the loss of faculty champions has been difficult for several initiatives (Barlett 2017b).

While faculty learning from faculty is a valuable outcome, one additional problem with the Piedmont Project is that there is no reliable way to measure the Project's effects on students. An inventory of sustainability-related courses helps conceptualize the impact the Project has had, but there is no data about the number of students influenced.

Eisen feels that including sustainability in the "hidden curriculum" is even more important than explicitly teaching it in class. Professors can accomplish this by having suggestions of sustainability and the natural environment in every class they teach. Eisen says he takes his introductory Biology classes on a field trip to Lullwater Preserve at least once every semester, in order for the students to make connections between the natural world and the cells they learn about in class. He also subtly infuses ideas of sustainability into his classes by assigning literature about how plant cells respond to climate change. Sustainability does not have to be stated as a course objective in the syllabus in order for students to learn (Eisen 2017).

The Piedmont Teaching Assistant Training and Teaching Opportunity Program, known as Piedmont TATTO, is a one-day graduate student version of the Piedmont project established in 2004. As a graduation requirement, Laney Graduate School doctoral students must develop a curriculum for a course of their own or to co-teach with a faculty member, so the Piedmont TATTO program serves as a means to help the graduate students meet that requirement. Each summer, ten to fifteen students are accepted into the program and, as of 2016, a total of 207 have participated (Barlett 2017b).

By 2005, the Piedmont and Ponderosa Projects had become successful enough that they were attracting attention from other universities hoping to adopt a similar model. Surprised by the number of requests to help run similar faculty development projects at other institutions, Barlett, together with Geoffrey Chase of Northern Arizona University, decided to create a workshop for educators from around the country to learn how to run their own "Piedmont/Ponderosa Project." Supported by the Association for the Advancement of Sustainability in Higher Education

(AASHE), Barlett and Chase began hosting biannual workshops at Emory and San Diego for other campus leaders, most from American universities but some representing nine different countries around the world. As of January 2017, 570 faculty leaders have taken the workshops, representing over 300 schools, many of which now have their own faculty development programs based on the Ponderosa and Piedmont models (Barlett and Chase 2012).

Faculty Advisory Council for OSI

As academic activities in sustainability such as the Piedmont Project, the new Sustainability Minor (discussed below), a range of sustainability-related speakers, and four well-attended Climate Change dinners began to build momentum, Barlett and Director of Sustainability, Ciannat Howett, recognized a need for a Faculty Advisory Council. In the fall of 2010, Emory's Office of Sustainability Initiatives convened a group with the following charges:

- Make recommendations as to the best ways to infuse curriculum with sustainability issues across all schools and at all levels of students.
- Explore ways to expand research programs focused on economic, social, and environmental dimensions of sustainability
- Develop hands-on sustainability-related research and practicum opportunities for students.
- Explore ways that Emory can increase its effectiveness in bringing to the campus students and faculty of the highest caliber who will contribute to these goals.

Ten well-respected faculty were recruited and appointed by the Provost to serve as advisors to OSI. Drawing from Oxford as well as the Druid Hills Campus, the group included faculty from Arts and Sciences, Law, Medicine, Nursing, Public Health, and Business. "The Council has been even more helpful than we expected," said Barlett, "offering us new ideas and sound advice on governance, visibility, and coordination strategies" (2017a).

One of the Council's first suggestions was to publicize the sustainability-related research that distinguishes Emory's campus. In response, eight short videos were made and posted on the OSI website, featuring faculty explaining their research and its connection to sustainability challenges. The featured faculty research spans issues on a scale from local to global. The videos are as follows:

- Amy Webb-Girard: Sustainable Food and Access
- Robert Agnew: Climate Change and Crime
- Karen Hegtvedt & Cathryn Johnson: Environmental Citizenship
- Paige Tolbert: Air Quality
- Uriel Kitron: Reducing Infectious Disease
- Jeremy Hess: Health Impacts of Climate Change
- William Buzbee: Climate Change Law and Policy
- Craig Hill: Sustainable Fuel Source

The research spotlight videos have raised visibility for these scholars and drawn attention to opportunities for students as well (http://sustainability.emory.edu/page/1021/Faculty-Profiles-&-Research-Highlights-Videos).

Subsequent to the creation of the Council, in October 2013, OSI decided to create an Associated Faculty group across the campus. This listserv now includes 90 faculty whose interests—either in research, teaching, or personal involvement—include sustainability. This group allows OSI and interested faculty to share news relevant to the academic side of sustainability.

In the fall of 2016, after the establishment of the second Sustainability Vision and Strategic plan, Barlett explored next steps for sustainability in academics by convening listening sessions for three groups of Piedmont Project faculty. Surprised by the breadth and vigor of discussions generated, she and OSI director Ciannat Howett subsequently expanded the Faculty Advisory Council to include 21 individuals. A major theme from the listening sessions was that faculty wanted a forum to hear what other sustainability efforts are happening on campus and to stimulate creativity in the various departments. Some felt it might spur friendly competition as well. One of the first acts of the expanded Council in 2016 was developing a "Green Ribbon" award, created to applaud sustainability-related student research. The OSI green ribbons were distributed in 2017 for the first time (Barlett 2017c).

Sustainability Minors and Credentials

Interdisciplinary Sustainability Minor

Emory's sustainability minor is unlike most minors offered by Emory and other universities because instead of featuring classes from one department, it expands students' fields of study to include departments not traditionally associated with sustainability. The minor was launched in 2010, after a proposal with contributions from interested students and support from diverse faculty. The proposal's goal was to create a program for students to learn about and internalize sustainability, balancing the social sciences and economic dimensions, along with the natural sciences that often accompany sustainability (King 2017). The Proposing Committee hoped that the minor would offer "students a way to document the education in sustainability that some of them are already pursuing" in order to be more competitive when applying for "green" careers (Sustainability Minor Committee 2009).

Prior to the minor, the university had acknowledged the importance of interdisciplinary studies, but "the institutional paradigms and practices… still do not fully support an interdisciplinary knowledge and synthesis of the kind that the study of sustainability demands" (Sustainability Minor Committee 2009). The sustainability minor addresses this need for interdisciplinary study because it grew out of the interests of students from around the college and business school, and the desire of faculty who wanted to create more sustainability classes after participating in the Piedmont Project. Over a dozen faculty members volunteered for the steering committee, representing fields such as English, Nursing, and Economics. Also, students from different parts of the college and business school each contribute a new perspective to the minor. Hilary King, sustainability graduate student fellow and instructor of the foundations course in 2015 and 2016, elaborates, adding that because the minor requires classes in three different fields, "the idea has been to let students… bring a social science and humanities lens to questions of sustainability," in addition to the natural science lens. Today, the range of classes that can fulfill the minor requirements spans from the African Studies department to the Religion department; the variety

of classes offered for the minor is testament to its success in drawing together multiple disciplines.

The minor is housed in the Institute for Liberal Arts, specifically in the Interdisciplinary Studies department. Peter Wakefield was the director of undergraduate studies at the time the minor was created. After five years, Justin Burton of the Physics department took over leadership of the minor. Throughout the minor's six years, a rotating steering committee of five to ten faculty has guided and supervised it. Ever since the original Sustainability Minor Committee wrote the Minor Proposal, the structure and rationale of the minor have remained consistent.

Students from all fields can earn the minor by completing one foundations class, one capstone senior year project, and four or five other approved classes, at least one from each division: natural sciences, social sciences, and humanities. Beginning from the first foundational class, students expand their definition of sustainability and come to terms with its pervasiveness in every field of study and life in general. A semester-long assignment in the foundations course, called an Applied Sustainability Exploration, allows students to choose an aspect of their daily life and explore how sustainable or unsustainable the process is. As King explains, it offers students an opportunity to "delve deeper in a multifaceted way and… to try to figure out how to communicate about that issue to audiences" (2017). By presenting this project to their peers, students practice effectively spreading knowledge and awareness, a crucial skill in the field of sustainability.

In a number of ways, the minor requirements force students to incorporate sustainability into various courses as well as their personal lives. Students must build an e-portfolio by writing reflective essays about each class they take for the minor. At the end of the four years, they can look back and see how their thinking about sustainability has changed as a result of their intellectual growth. The description of the e-portfolio says that the purpose of these essays is to "[reflect] on major issues and themes from [students'] individualized experiences." Hilary King also explains that the goal is to identify areas of intellectual and personal growth between the first class for the minor to the last class for the minor. Another way to display their learning is the capstone experience senior year. King says that students often engage with the Atlanta community for these projects, by "doing interviews with folks in Atlanta, [or] volunteering at school gardens," so they can learn about "how other people are working on sustainability" outside of the Emory community (2017). By participating in sustainability initiatives outside of the classroom, students can prepare themselves to start a career in sustainability, which King cites as the main reason why students choose to pursue the minor. Since the beginning of the minor, King has noticed an increase in the preparedness of students when starting out in the program. She says students now have "nuanced ideas that they have already developed that lead to really interesting applied projects for the capstone" (2017). The environmentally focused curriculum of previous courses has prepared students to think critically about how they can make a difference in sustainability with the capstone project.

Though the creators of the sustainability minor faced no resistance from the university, a challenge King has noticed in recent years is that Emory students have been unlikely to declare a minor instead of a second major. King believes that students prefer to double major rather than minor in sustainability because they are high achievers, so they do not look into the opportunities that the sustainability minor provides. For the time being, there are no plans for a similar

sustainability major. King also reports that she thinks the minor program is "on the right track" because it is taking on the challenge of fusing the different definitions of sustainability including both the "ecologically based science" as well as "behavior and values change" (2017). The challenge of relating the two approaches is "one that is exciting and doesn't yet seem to be solved anywhere," so she sees the minor as an opportunity for students and faculty alike to discover "the best ways to bring those approaches together" (King 2017).

In fall of 2013, the Office of Sustainability received a gift from the Ray C. Anderson Foundation to create a transformative student Sustainability Scholar-Leader Program. The award of $180,000 over three years supported students' intellectual and personal growth as change leaders by developing a new leadership course in which students were paired with local Atlanta sustainability mentors. The grant also supported a series of new courses for the Sustainability Minor, through a new postdoctoral fellowship. It allowed Emory to enhance its campus internship program and the Piedmont Project opportunities for faculty. The gift was pivotal in integrating the Foundations course of the Minor with an expanded array of mid-level courses, on-campus engagement with sustainability, and then a senior experience with the leadership course and community partners (Barlett 2017c).

Additional Sustainability Credentials

Other opportunities beyond the Sustainability Minor exist for Emory students. The Environment and Sustainability Management Concentration in connection with the Business School was created as a response to student interest in environmental consulting careers. The Environment and Sustainability Management concentration is available to both Environmental Science majors at Emory College of Arts and Sciences and Emory students earning a Bachelor of Business Administration at Goizueta Business School. Students with a business background focus on the "history, politics, and practice" of sustainability and the environment, while students with an environmental science background learn business principles and practices (Goizueta Business School 2017). All students must take two core classes on subjects in environmental science or business respectively, as well as two upper-level electives and a capstone course about the ethics of leadership. Internships, speakers, and field projects may also contribute to learning. The goal of the concentration is to offer both a "green" and a business background, which will prepare students with either academic focus for a career in environmentally sustainable management (Goizueta Business School 2017).

In spring 2013, the Environmental Sciences Department expanded its offerings to include sustainability issues. New credentials for students were created, including the Sustainability Sciences Minor, which is available to all students in the College who want to explore the relationship between humans and the environment. Composed of existing classes in Environmental Sciences, the required courses for the minor include the two-course introduction for all environmental science students, one methods class, and three electives. The minor is finished with a service learning course to gain practical experiences working in the environment of Atlanta. Courses in the minor seek to "link the theoretical and practical" applications of sustainability; for example, students learn how institutions incorporate sustainability into their functioning using the field experiences in the service learning class (Department of Environmental Sciences 2017). There was some controversy within the College over the proposal for a separate sustainability sciences minor. Though some administrators and faculty

felt expanding the existing Sustainability Minor to have two tracks was preferable, the Environmental Sciences Department chose to create a separate minor (Barlett 2017d).

Piedmont II

In November 2011, a wide range of faculty from many departments of the College and the professional schools met for a two day conference which was "both retrospective and forward-looking," to discuss the impact of the Piedmont Project on all aspects of the Emory community over the past ten years, and to explore the future of sustainability (Report of the Piedmont II Committee 2011:1). Held in a panel format, the "conference discussion underscored a difference of opinion about what sustainability is and how to give it greater visibility at Emory," and by the end the discussions yielded lists of issues for action and potential next steps. (Piedmont II Committee 2011:1)

> The Piedmont II discussion targeted four major issues for action:
> 1) The development of a strategy for supporting and strengthening interdisciplinary research on sustainability.
> 2) Exploration of ways to enhance curricular innovation and team-teaching around sustainability issues, especially across departments and schools.
> 3) The identification/creation of an institutional home to provide that support in research and pedagogy.
> 4) The development of a coherent university-wide sustainability narrative to underwrite and facilitate unified—but disciplinarily diverse—research, teaching, policy, and profile development around sustainability issues. (Piedmont II Committee 2011:2)

Piedmont II generated a few plans to accomplish the four areas of action.

> 1 and 2) Develop a strategy to support and strengthen interdisciplinary research and pedagogy on sustainability by the creation of an interdisciplinary Piedmont II working group tasked with a self-study to ascertain the potential for research, pedagogy, and any other involvement in sustainability-related issues at Emory on the level of departments, programs, centers, and schools. Over the next year, this group would create a detailed map of current and future sustainability activities by initiating and sustaining campus-wide conversations that would also certainly inspire new ideas and projects in the process of mapping current initiatives. A goal of particular interest would be to illuminate plans and strategies to support existing and emergent research projects, especially where interdisciplinary clusters came to the fore.
> 3) Explore the most creative and appropriate administrative structures to support these efforts.
> 4) Develop a coherent university-wide sustainability narrative to underwrite and facilitate unified—but disciplinarily diverse—research, teaching, policy, and profile development around sustainability issues. A goal of particular interest is the articulation of a visionary plan for how to position Emory for national recognition in sustainability research that matches its accolades for institutional and pedagogical achievement. (Report 2011:3)

Though interest during Piedmont II was high, afterwards, some of the initiatives were forgotten as interested faculty left the university. The various initiatives proposed at Piedmont II did not

receive enough faculty and university support to go forward (Barlett 2017c). However, Piedmont II incubated the new Sustainability minor, which had emerged earlier that year from the desire to strengthen interdisciplinary research and team-teaching (Barlett 2017c). A center or "institutional home" for sustainability research was discussed, but resources were not available and the efforts of OSI moved in other directions (Barlett 2017c). While Emory's research in sustainability is still not as recognized as its course offerings and institutional efforts, the vision of Emory's research becoming more nationally recognized is slowly coming true as more research nodes are explored (Barlett 2017c).

Continuing Education Certificate

In 2012, Barlett and Ciannat Howett were invited by Emory's Office of Continuing Education to develop a certificate in sustainability for the Atlanta general public. Partnering with Susan Kidd, the sustainability director of Agnes Scott College, the three developed a curriculum with a sequence of three courses. Kelly Weisinger was hired as the new sustainability programs coordinator at OSI and provided programmatic support for the certificate. The students who made up the first cohort had diverse backgrounds: some worked for corporations like PriceWaterhouseCoopers, or nonprofits like The Nature Conservancy, and some were citizen advocates doing volunteer work in their community. Several other Atlanta leaders served as course facilitators and speakers, but finding consistent leaders was a challenge. Though the first sequence of the certificate was judged a success by faculty and participants, public interest was not strong enough to continue the program after the graduation of the first cohort.

The sustainability certificate at Emory emphasized connections to local issues. By accepting mostly Atlanta-based students, Weisinger explains, the course would "invest in our sustainability network in the Southeast" (2017). The guest speakers for the course were chosen because their expertise was in "region-specific challenges." For example, one guest lecturer was a leader of the Chattahoochee Riverkeeper and talked about the water wars with Alabama and Florida that Georgia has been involved with since it began withdrawing water from the Buford Dam. To read more about water issues in Atlanta affecting Emory, see Stormwater Management and Water Conservation at Emory University (Kelly Endres). For the course about policy, two of the lecturers came from the Southern Environmental Law Center and the Environmental Protection Agency. The coursework built from foundations of sustainability, to technical information such as transportation, renewable energy, and office practices, to community involvement and leadership models. The goal of the courses was to impart knowledge that would prepare the leaders to implement sustainable practices for themselves and for their organizations. Before they graduated with the certificate, students designed a final project to implement, based on the skills they learned in class. A couple of notable examples were a Nature Conservancy employee's plan for a LEED-certified building at her child's school and one resident's work to include sustainable practices in the strategic plan for the new city of Brookhaven. The continuing education certificate helped the university spread sustainable practices and expertise in the community and outside Emory's gates.

Oxford

Located in Oxford, Georgia, Oxford College took their own initiatives to infuse academics with sustainability. Students have helped lead the push towards a greener Oxford since 1988, when

they formed Students Interested in Recycling (SIRE). Since then, Oxford has grown more sustainable in a number of ways. Dr. Theodosia Wade, a Biology professor at Oxford who has been instrumental in teaching sustainability, took the Piedmont Project in 2001, the first year it was offered. She reports that she got to know a few other Oxford faculty through the experience, and now there is a substantial cohort of Piedmont Project graduates at Oxford. She changed one of the labs in her biology class to be more investigative and related to the environment as a result of participating in the Piedmont Project.

In fall of 2011, Wade led the alumni of the Piedmont Project at Oxford to push for an official academic theme called Sustainability at Oxford: Life in Balance. The theme's goal was to include sustainability in as many parts of the curriculum as possible, and Wade reports that it was widely successful. It was the official theme of Oxford College until spring of 2015. She sees the theme's most important mission as making Oxford students "better citizens, who are informed and who are able to inform others" (2017). During the theme, in addition to the general infusion of sustainability in many classes, there were also seminars offered on the subject. Now, sustainability is more of a focus in the honors program, which came about at the same time as the theme was starting, according to Wade. In the honors program, an interdisciplinary honors seminar is offered, called Place and the Geology of Georgia, which features field trips around the state (Wade 2017).

Wade feels that the theme created a sense of community among professors from different departments who had expressed interest in taking part, but now that the theme is over, she believes some of that organization and drive has been lost. She feels that while Facilities Management at Oxford has made well-publicized strides in sustainability with LEED certified buildings and the economic returns that go along with green management, at the same time, sustainability efforts in academics have not been promoted as well. The academic side of sustainability has lost its "voice" since the theme ended one year ago, and though sustainability themed classes are still being taught, they are not as organized or publicized as before (Wade 2017).

Oxford also faces more challenges to sustainability, which are difficult to solve. First, student turnover occurs every two years, so students who express interest in leading initiatives and learning about certain sustainability topics in class are often not in residence long enough to enact significant change. Wade believes even more support for sustainability from administration would help address this issue, so that student-led programs like Earth Day are consistent from year to year. She reports that some years Earth Day is well run, and others it is less so, because the valuable student efforts from the year before are forgotten once students graduate from Oxford (2017). Additionally, it would be helpful to have one person appointed to organize the professors teaching classes with sustainable themes and to promote the achievements of these classes to students and the university community (Wade 2017). Wade predicts that recognition for the work that is ongoing and support from the administration to supplement the quick turnover rate of students will help bring sustainability to the forefront of Oxford College again.

The use of sustainability as a teaching tool has grown significantly since the purchase and launch of the Oxford Organic Farm. Wade describes the farm as a result of a "vision of a number of people" (2017). Dean Stephen Bowen was instrumental in working to acquire the land and permits for the farm. Marshall and Fran Elizer sold the farm to Trulock Dickson, who donated

the land to Oxford as an educational organic farm, and in early 2014 the transaction was complete. Daniel Parson was hired as an educator and full-time farmer after having previously farmed for over 15 years. By the grand opening in fall 2014, the farm was functional and ready to give tours to classes.

The goals of the Oxford Organic Farm are being accomplished at a fast pace. The first goal for the farm was to sustain itself economically, which has now been achieved. Wade explains that the next goal was to have students taking tours "formulate their own questions about the farm," guiding the direction of their tours, rather than passively listening (2017). Wade started to include the study of insect biodiversity at Oxford Organic Farm in her Biology courses in order to teach the scientific method. These labs opened the door to even more classes incorporating experiences on the farm into their curriculum. Wade reports that having the farm as part of campus has enhanced in-class learning for many fields, in a way that students truly enjoy (2017). One sociology class, taught by Dr. Deric Shannon, uses work on the farm as a hands-on experience to help students learning about food issues to better understand what life is like as a farmer and connect to the sources of their food. Daniel Parson helped teach lectures about GMOs as well. Dr. Fankhauser, a biology professor, teaches a course using bacterial communities on the farm in which students collect bacteria, isolate the DNA, and add their findings to a bacteria database.

The farm is being used for learning outside of academic courses as well. Students have begun to do independent research projects such as studying soil biodiversity. Another opportunity for students is employment as a work-study farm intern. The experience of working on a farm while attending college is a unique one, which teaches students a sense of responsibility to where their food comes from. Lindita Camaj, a student worker on the farm says "I've learned how to plant and how to hoe. I've learned how much energy goes into the smallest details. I will never see carrots the same way again" (Oxford College 2017).

The newest development in sustainability education at Oxford is the creation of an Environmental Sciences department starting fall 2017. Currently, Steve Henderson, a professor of geology, teaches about environmental sciences and after his retirement, Melissa Hage, from the geology department at the University of Wisconsin, will be the first faculty member of several hires planned for the new Environmental Sciences department.

Figure 3. Students harvesting crops on Oxford Organic Farm learn about the sources of food. (Barlett)

Research Nodes

Even before Emory College began offering courses in sustainability, faculty research in many units addressed sustainability issues from different disciplinary perspectives. Notable for a range of projects in the United States and abroad was the Rollins School of Public Health that began in 1990. The Environmental Health Department specialized in research on threats to human health and impacts of environmental disruption, focusing on air and water quality and also on the built environment. Global Health also connected with sustainability issues in many ways. A formal program in Environmental Law was publicized in 1995, and Emory became known for research in climate change policy and environmental regulation. As the Environmental Sciences department grew (originally named Environmental Studies), some faculty research focused on issues related to sustainability, such as Uriel Kitron's studies of urban insect disease vectors. Research was also carried out by Karen Hegtvedt, Cathryn Johnson, and their Sociology Department students on sustainability-related attitudes, values, and behaviors, using the Emory College "Living Green" dorm as a laboratory (see the Office of Sustainability's faculty profile videos on these research efforts).

Faculty research interests have also created hands-on learning experiences for students. The Turner Law Clinic at Emory Law School was established in 1998, each year providing over 1000 hours of pro-bono legal work to advance environmental causes (Emory Law 2017). Students and professors at the Rollins School of Public Health have also been contributing to Emory's sustainability research nodes by conducting research on safe water and other environmental health issues for many years. These two schools' pioneering research and legal efforts eventually paved the way for a succession of other research groups in many of Emory's disciplines, which are described here.

Turner Environmental Law Clinic

The Turner Environmental Law Clinic prepares Emory Law students for careers as environmental attorneys by helping them gain practical experience fighting for meaningful causes. The goal of the clinic, which is directed by Mindy Goldstein, is to offer "important pro bono legal representation to individuals, community groups, and nonprofit organizations that seek to protect and restore the natural environment for the benefit of the public" (Emory Law). Partnering with organizations from Georgia Organics to Nuclear Watch South, they focus on regionally significant issues, such as clean and sustainable energy; sustainable agriculture and urban farming; and water, natural resources, and coastal communities. Working at the clinic leaves a memorable impact on students, and immerses them in sustainability issues they otherwise might not have the opportunity to work on. For example, Jonathan Gorham, a 2013 graduate of Emory Law School, described his experience as an "opportunity to participate in the drafting of an amendment to the Atlanta Zoning Code to provide for urban agriculture in the City of Atlanta. I then collaborated with Professor Goldstein and a team of partners and clients to build support for the amendment from government officials and communities. Working on such a tangible advocacy project has been the highlight of my law school experience" (Emory Law). While still in law school, students like Gorham engage in intensive work which shows them the pressures and rewards that will come from practicing environmental law for the public interest.

Center for Global Safe Water, Sanitation, and Hygiene

Operated by the Rollins School of Public Health, the Center for Global Safe Water, Sanitation, and Hygiene, known as Center for Global Safe WASH, strives to use research and outreach to help communities provide safe water for all their members. The center was founded in 2004 with the support of public health physician and professor emeritus Dr. Eugene J. Gangarosa and his wife Rose Gangarosa. Dr. Christine Moe is the director of the center, which aims to empower communities worldwide to provide "safe, effective, and sustainable drinking water and effective and sustainable sanitation and hygiene improvements" (Center for Global Safe WASH 2015). While earning their masters or doctorate in Public Health, students can take classes taught by Center for Global Safe Water, Sanitation, and Hygiene faculty to learn how to "conduct water and sanitation research, implement interventions, deliver health education, and evaluate and monitor programs in the U.S. and overseas" (Center for Global Safe WASH 2015). The Center for Global Safe Water, Sanitation, and Hygiene has introduced more opportunities for students to get involved and specialize in this field since its inception. For example:

> In 2012, the CGSW introduced the Certificate in Water, Sanitation, and Hygiene (WASH) at the Rollins School of Public Health. The WASH Certificate is a rigorous, self-guided certificate program that aims to increase the competitiveness of RSPH students for WASH-related careers. Graduate students pursuing the Certificate complete a minimum set of credit hours of WASH-related coursework, attend CGSW seminars and complete a WASH-related thesis, practicum or capstone (Center for Global Safe WASH 2015).

Besides gaining field experience that will prepare them for a career in Global Health, students help enact and maintain sustainable water and sanitation projects, which benefit citizens on an international level. In addition to its global efforts, the center also has local focuses, from a research study about the microbial load in water fountains in the Hartsfield-Jackson International Airport, to efforts to publicize their research in the form of presentations at the Atlanta WaterWise symposium and speeches at the Emory WaterHub (Center for Global Safe WASH 2015). With a focus on learning outcomes and global as well as local sustainability, the Center for Global Safe Water, Sanitation, and Hygiene is preparing students for careers in a future they are already helping to shape.

Renewable Energy Consortium

Emory Bio-inspired Renewable Energy Center, known as EBREC, is a research project started by Brian Dyer and currently led by Tim Lian. The "Renewable Energy Consortium" conducts research combining chemistry, physics, and biology in order to innovate alternative energy technology. The goal is to use only solar energy and water to create hydrogen energy, which can also be harnessed cheaply. The interdisciplinary nature of this research has required labs to bring together experts in diverse topics. The Emory scientists have made breakthroughs, which mean that this new form of cheap, accessible, renewable energy could be a viable option in the future.

However, the Emory Bio-inspired Renewable Energy Center is not only trying to solve the practical problem of inventing an inexpensive process for hydrogen fuel. In an interview published online, Brian Dyer explains the center's other goal: to facilitate social change by establishing "political will, economic incentives and public outreach to help people understand that our collective future depends on clean, renewable energy" (Dyer Interview 2010). To accomplish this feat, the researchers plan to "leverage Emory's tremendous strengths in community engagement and global initiatives that span disciplines," in order to show that renewable energy, specifically the affordable hydrogen fuel they are working to create, is the way of the future (Dyer Interview 2010).

Food Systems Academic Interest Group

> Emory Food Systems Academic Interest Group is a community of scholars who have been in dialogue around fair food systems, agriculture, and sustainability since 2013. Faculty have met, held forums, shared papers in a semester-long Academic Learning Community, and sponsored speakers [to visit the university]. The group benefits from intellectual connections not only among social scientists and health practitioners, but also with ethicists, language specialists, and area studies faculty who link health, dietary change, and culture. Connections at present include faculty in business, law, nursing, medicine, public health, and theology as well as [Emory and Oxford colleges and the graduate school]. Several undergraduates have designed independent food studies majors through the [Institute for the Liberal Arts], and faculty are [interested in] a … formal Food Studies Program (Food Systems Interest Group 2016).

Jonathan Crane of the Center for Ethics is currently leading the effort to create a formalized Food Systems program (Barlett 2017c).

Climate at Emory

Climate@Emory is an initiative created by faculty from over 20 different departments, which has permeated many different academic realms since its spring 2014 beginning. The goal of its many faculty representatives is to "advance climate change scholarship, teaching, partnership, and engagement at Emory and beyond," which it has begun to accomplish by sending a group of faculty and students to the 2015 United Nations Framework Convention on Climate Change, where the Paris Agreement was created, as well as the 2016 Conference of the Parties in Marrakesh (Robertson 2015). In addition, "faculty participated in a series of White House roundtables on climate change and health; the university convened a Day of Scholarship with experts from Emory and the Georgia Institute of Technology; and Emory researchers published key findings on topics ranging from the physics of melting icebergs to the impact of climate change on China's development trajectory" (Robertson 2015). To read more about this initiative which is bringing faculty and students together over a shared dedication to sustainability, see "Climate@Emory" in Carbon, Climate and Co-Generation: A History of Emory's Energy and Climate Commitments (Katelyn Boisvert).

Climate Change and Society: The Paris Agreement

One of the first accomplishments of the Climate@Emory initiative was obtaining official accreditation for Emory as an observer at the United Nations annual Conference of the Parties beginning in 2015. They then organized the cohort of students and faculty who attended the 21st Confernce of the Parties (COP21), where the Paris Agreement was crafted. Eri Saikawa, a professor of Environmental Sciences, Sheila Tefft, a professor of Journalism, and Wesley Longhofer, a professor at the Business school, prepared the students in this group for their learning experience as observers at the conference with a class leading up to the November trip. In the spring 2016 semester, Saikawa taught the course again, in a different format. Then, in fall 2016, a different group of students traveled to COP22, held in Marrakesh, Morocco. In fall 2017, she will again teach a similar course prior to COP23, to be held in Bonn, Germany. While enrolled in "Climate Change and Society," students may apply to travel with the Emory group to the next Conference of the Parties. For more information on the first Emory cohorts attending COP21 and COP22, see UN COP Delegations in "Carbon, Climate and Co-Generation: A History of Emory's Energy and Climate Commitments" report by Katelyn Boisvert.

Emory Climate Analysis and Solutions Team (ECAST)

Another initiative of Climate@Emory has been the formation of the Emory Climate Analysis and Solutions Team (ECAST) in the 2016-2017 school year. This initiative, which meets monthly, is made up of both graduate and undergraduate students, as well as co-chairs Daniel Rochberg, an instructor at the Rollins School of Public Health and Department of Environmental Sciences, and Geoff Martin, an M.S. candidate in Environmental Sciences, who want to conduct climate analysis and investigate climate change solutions (ECAST 2017). Students are split up into problem-solving teams, each with a unique focus—from establishing a carbon neutral degree to offset Emory's carbon footprint, to providing free energy assessments for business owners. For more information on these collaborative efforts between students, see Emory Climate Analysis and Solutions Team (ECAST) section in "Carbon, Climate and Co-Generation: A History of Emory's Energy and Climate Commitments" by Katelyn Boisvert.

Religion and Ecology/Life Systems Collaborative

Formed for the first time in the 2015-2016 school year, the Religion and Ecology/ Life Systems Collaborative has been successful so far in bringing together scholars in order to "craft innovative, transdisciplinary responses to environmental uncertainty" (OSI 2016). Meeting monthly in colloquies, where members' research is presented, the Collaborative has grown since it began:

> The REC emerged out of multiple collaborations between diverse faculty and graduate students at Emory, including colloquies, co-taught college and graduate courses, research partnerships, and conversations during international and national conferences—especially the annual meetings of the American Academy of Religion. Over the past year, the REC's participants drew from a multidisciplinary team of four faculty, one post-doctoral researcher, and nine graduate students. Participants were affiliated with Emory College, the Laney Graduate School, Candler School of Theology, the Biology Department, and the Emory Center for Ethics… Each month in the spring semester of 2016, the Religion and Ecology Collaborative held colloquies focused on REC member's research. (Patterson 2016)

A notable achievement of this multidisciplinary group was the seminar course offered to graduate students in the fall of 2015 called "Theories of Resilience Science and Civic Ecology: Questions about the Roles of Religion." Emory professors Bobbi Patterson and Lance Gunderson taught the course with many guest lectures from experts in the field. The goals of the Collaborative include connecting its members and continuing to publicize its colloquies "to the wider Emory community" as well as gaining "more collaborators across departments and schools" (Patterson 2016).

Course Offerings and Curricula

The Sustainability Tracking, Assessment, and Rating System (STARS) survey in October 2016 showed that together, all the schools of Emory offer 328 courses "that are either directly focused on sustainability or are related to sustainability issues." The survey also found that 96 courses offered in 2016 used the campus as a "living laboratory for sustainability—testing water, measuring behavior, studying policies, or other engagements." (Barlett 2017b). With improved organization of sustainable classes and faculty, and increased access to these types of learning experiences across the university, sustainability is infusing the education of thousands of Emory students every year. Highlighted in this section are a few courses and one curriculum, which have offered students and professors from diverse disciplines the opportunity to collaborate on sustainability issues that face the world today.

Nursing Curriculum

One of the many curricular revolutions to emerge from the Piedmont Project was the paradigm shift at the Nell Hodgson Woodruff School of Nursing. Instead of "inserting" sustainability into an existing curriculum, faculty such as Maeve Howett and other Piedmont Project alums helped revise the comprehensive curriculum, to use an "'eco-centric' paradigm, which takes into account the entire environment of health, in place of the curative-medicine, patient-focused 'ego-centric' paradigm" (Barlett and Chase 2012:17). New courses contained connections between environmental health and human health. The change at the Nursing school to focusing on the environment of health first has come about as a result of the different pedagogical approaches taught at the Piedmont Project. For more information on eco-centrism in the Nursing curriculum, see Curriculum and Student Input section in "Sustainable Healthcare at Emory University" report by Lauren Balotin.

Medical School Curriculum

In 2007, the Emory School of Medicine also underwent a curricular change to increase learning about social and environmental effects of health. J. William Eley, the Executive Associate Dean for Medical Education and Student Affairs at the School of Medicine, worked on the new curriculum before it was implemented. The objective is to teach medical students that healthcare is more than "what goes on between a doctor and a patient," it also includes the larger context in which the patient lives (Eley 2017). Now, during students' first week of school, they begin to learn about "Global Threats to Health" such as "air pollution, urbanization, neighborhood geography, water issues, poverty, [and] violence" (Eley 2017). Eley says students develop an understanding of the "social causes of disease," from lectures on these topics and a service

project in the community (2017). His goal in recreating the curriculum was to have students understand "health in the context of culture and the environment" so they can be "advocates" for a healthier environment that will impact both themselves and their patients (Eley 2017). To read more about the social and environmental health curriculum at the School of Medicine, see "Sustainable Healthcare at Emory University" (Lauren Balotin).

Sustainable Food Fair Class

The Sustainable Food Fair Course has been a well-known feature in the Emory community since 2007. The fair is supported by Emory Dining, the Office of Sustainability, and in 2016 by the Center for Faculty Development and Excellence. For the first half of the fall semester, students plan, publicize, and execute a food fair to educate the Emory community. The fair brings together multiple vendors such as grass-fed beef farmers, fair trade chocolatiers, and owners of organic restaurants, in addition to informational tables staffed by students. Barlett's students led the first food fair in April of 2007 as part of her Fast Food/Slow Food course about sustainable food systems. The next year, the fair was moved to September to allow farmers to showcase more produce, and in 2008 the fair was offered as a freestanding course (Barlett 2017a). The course has been taught for ten years with Hillary King filling in while Barlett was on sabbatical. Through the years, the class has changed, bringing new elements to the learning process, and expanding the fair to become an Emory tradition.

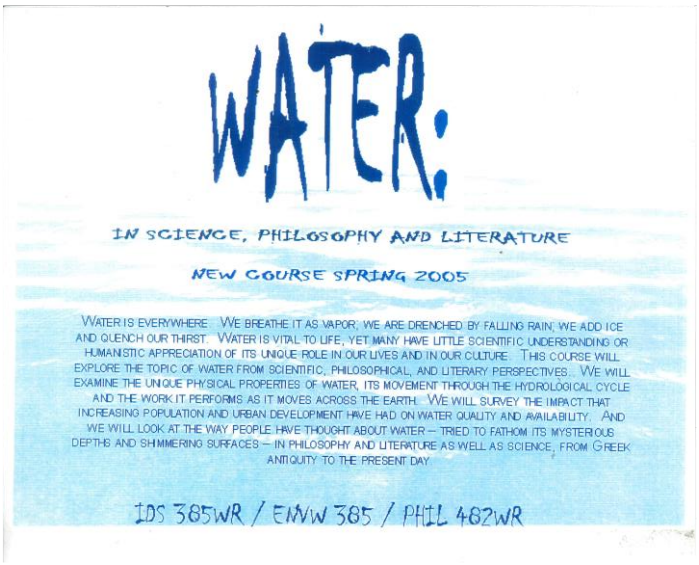
In 2016, Dr. Simona Muratore, an Italian professor and longtime fresh food enthusiast, taught the Sustainable Food Fair course, which she hopes to continue in the future. She explains how her role was more of a facilitator than professor, because the course is entirely student-led. She says the students that enroll in the class are highly motivated, and that they "practically become experts on sustainable food… then they organize the entire fair and they have to consult with vendors, [and] design publicity material, in order to find the best way to teach the Emory community…about sustainable food" (Muratore 2017). There are six teams of students with different objectives to bring the food fair to life: the design team that creates T-shirts and flyers, the logistics team that creates a layout for the fair and trains volunteers, the publicity team that operates the Facebook page and advertises on campus, the hosts who make sure the day of the fair runs smoothly, the music team that books musicians for the fair, and the feedback team that does most of their work after the fair, gathering suggestions from the vendors and students for next year. All the students work at educational tables during the fair to help visitors understand the sustainable food choices being offered.

Social media was a new component added to the curriculum in 2016 by having students publicize their sustainability efforts via Instagram. Each week leading up to the Fair, they shared pictures of themselves making sustainable choices, such as refilling a reusable water bottle at the water fountain, on their personal Instagram accounts in order to spread the word about the event. Muratore says this social media experiment was a convenient conversation starter for students and their friends (2017). In addition, the 2016 Fair had a website where students in the class blogged throughout the semester, which helped them track their peers' journeys towards sustainability as well as their own. Bringing social media into the course's curriculum helped students both publicize the Sustainable Food Fair and understand how taking the course affected their classmates' sustainable practices.

Muratore hopes to continue growing the curriculum of the Sustainable Food Fair class in future sessions. She says that she would like to add a cooking lesson and a field trip to the Oxford Organic Farm for her students to engage in experiential learning. The class has taught her, and her students, that sustainable food is common to many cultures, and facilitates transdisciplinary learning. Muratore has used the class as a platform to teach about Italian literature, an important part of her culture, as well as other disciplines students might not have otherwise studied in their academic career (2017). The course is cross-listed under Anthropology, Italian, and Interdisciplinary Studies, so there are many different types of academic backgrounds contributing to class discussion. For Muratore, whose goals are to both "spread the culture of my country" and "learn from the students," she is happy to bear the torch of the Food Fair class, which has been successfully infusing academics with sustainability for years (2017).

Interdisciplinary Water Classes

A final example of Emory's sustainability-related academic efforts highlights links between scholarship, teaching, and student futures. Two interdisciplinary classes on water brought together Emory College professors and students from radically different academic backgrounds to learn about water in ways they had never before considered. The idea that spawned these courses arose during a Piedmont Project field trip to a water reclamation facility in 2004 (Barlett 2017b). In the spring semester of 2005, a group of three faculty from the fields of poetry, geology, and philosophy taught the first of the two classes, "Water: In Science, Philosophy and Literature." The classes used diverse pedagogical methods from each of their fields, fulfilled the writing requirement, involved fieldtrips around the state, and enrolled 45 students.



In 2007, Professor Anne Hall, the geologist, taught another water course with ethno-musicologist Professor Tong Soon Lee and biologist Arri Eisen. Called "The Science and Sound of Water," the class again drew on diverse teaching methods and disciplinary lenses to help students form a holistic view of water (Eisen et al. 2009:101). Activities included performing Korean farmers' dance-drumming to awaken weather spirits and bring rain, to creating various forms of water art. In addition to their prior experiences, the professors counted on "the network of faculty, ideas, and infrastructure such as the Piedmont Project community already in place at Emory" and the

databases of past Piedmont courses. Guest lecturers and field trip leaders were also available from Piedmont networks (Eisen et al. 2009:101). During both courses, students wrote reflective journals on topics they chose, which were designed to create "links between course topics and their personal experiences" (Eisen et al. 2009:102).

By attending the Piedmont Project, the various professors involved with the water courses were able to overcome the obstacle of simply interacting with each other, which normally would have prevented such collaborations from developing (Eisen et al. 2009). At Emory, faculty from different departments are "located in different parts of the campus, both geographically and intellectually. Like other research universities, we are a campus with thousands of faculty members and virtually no history of interdisciplinary interaction—until recently" (Eisen et al. 2009:101). The Institute for the Liberal Arts at Emory has provided opportunities for collaboration across the disciplines since the 1950s, but the water courses were the first initiatives by faculty to teach a sustainability subject in an interdisciplinary manner. The professors placed high importance on teaching students how to collaborate effectively across disciplines, rather than just presenting the students with a series of unrelated lectures. According to students, water was a useful topic to approach interdisciplinary thinking, because it involved personal connections and many disciplines. By the end of the course they could "use information from different fields to develop better, more comprehensive solutions to water-related problems" (Eisen et al. 2009:104).

Though the courses differed in size, assessment basis, and pedagogical approaches, they shared the end goal of preparing students to graduate into the working world, where interdisciplinary thought and action are often required. The classes were an effort to start rectifying a problem that exists in many modern university settings: the "serious mismatch between the graduates [that universities] produce and the needs of a world in which discipline-based knowledge is used in creative, interdisciplinary ways" (Eisen et al. 2009:99). After each of the courses, students reported that they had developed and implemented interdisciplinary thinking, with one describing their transformation as "no longer [seeing] things in only black and white, but shades of grey. This class has taught me to use knowledge from different aspects to make good decisions" (Eisen et al. 2009:99). Students reported that they left the courses more prepared to use interdisciplinary "out of the box" thinking in their future careers than they were before (Eisen et al. 2009:103). This outcome highlights not only the satisfactions of broad, sustainability-related learning and research, but also its practical applications and personal meanings. Though many departments have only begun to embrace what "sustainability as a prerequisite" might mean, in many ways, at Emory it is no longer an elective.

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