

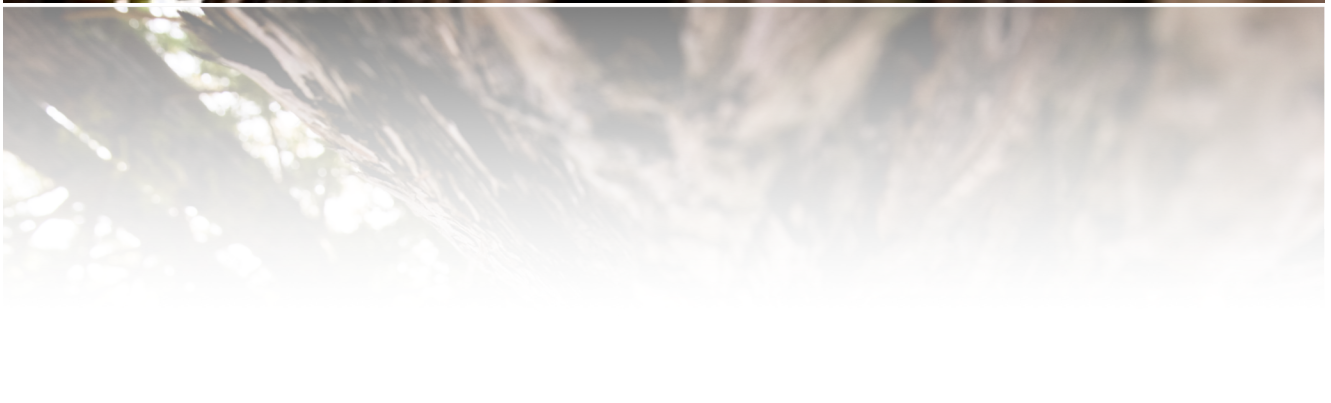
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# Carbon Fund Annual Report

University of California, Santa Cruz

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2015-2016



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## Letter from the Sustainability Director

Greetings!

It is my pleasure to share the 2016 Carbon Fund Annual Report. This year, the Carbon Fund financed 23 projects, each of which has benefitted student engagement in sustainability both on campus and in the local community.

It has been an honor this year to serve as the advisor to the Carbon Fund committee, a committed group of student, staff and faculty representatives. The committee worked together to make fair and equitable funding decisions for a wide variety of projects. Since the Carbon Fund is supported entirely by student fee Measure 44, the committee worked conscientiously to ensure they were using student fees in a responsible way to advance campus sustainability, while also supporting opportunities for student innovation. This year's accomplishments would not have been possible without this engaged group of individuals!

I hope you find inspiration as you review the projects featured in this report, which demonstrate how much positive change we can make toward building a more sustainable world with just a little inspiration, innovation, dedication, community engagement, and student fee funding.

Elida Erickson  
Sustainability Director  
Spring 2016



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### *Acknowledgements*

The Carbon Fund, on behalf of the UCSC Sustainability Office, would like to thank our student body for dedicating our campus towards local climate action. In addition, we would also like to thank the mentorship provided by Elida Erickson, our advisor and Sustainability Director, as well as our dedicated committee for making our work possible.

Thank you.

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## What is The UCSC Carbon Fund?

In 2006, UC Santa Cruz students passed Measure 26, a student fee measure taxing themselves to buy Renewable Energy Certificates (RECs) in order to offset the climate impact of campus electricity purchases. In 2010, students changed the use of these funds through the passage of Measure 44. This amendment allowed funds to be used for sustainability projects that would directly reduce our campus' carbon footprint. Thus, the UCSC Carbon Fund was created. Today, every undergraduate and graduate student gives \$3 per quarter to allocate to students, staff, and community projects that reduce greenhouse gases on campus and in the community. The Carbon Fund grants help directly reduce greenhouse gas emissions, implement relevant research, or carry out educational programs. The UCSC Carbon Fund is one way our campus is striving towards carbon neutrality by 2025.

Grants are given at two funding levels: Macro, projects requesting over \$5,000, and Micro, projects requesting under \$5,000. Micro grants take 4-6 weeks to process while Macro grants, with additional paperwork and processing needed, takes 2-3 months. The Carbon Fund grants on a yearly funding cycle based on the academic schedule.



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## The Carbon Fund Committee

The Committee's commitment is foremost to the campus and its students, keeping in mind that our fund is derived from student fees. The purpose of the committee is to review project proposals from students, staff, and faculty in accordance with our criteria and mission statement. The committee also offers their expertise in deliberations, and assistance to proposal authors in post- funding implementation. Carbon Fund Committee meetings are also open to the public. Interested students, staff, faculty or community members may attend but do not have speaking rights unless requested in advance. If you are interested in attending please contact the Carbon Fund staff beforehand.

### Members

Representative	Organization
Jordi Vasquez	UCOP Climate Action Student Fellow
Aaron Kaufman	Education for a Sustainable Living Program
Judy Li	Student Environmental Center
Kathleen Rogers	Procurement Services
Sarah Gilchrist	Physical Plant
Yihsu Chen	Faculty
Lauren Lehrer	UCSC Sustainability Office (Student)
Elida Erickson	UCSC Sustainability Office (Staff)
Amanda Roletti	Carbon Fund Outreach Coordinator
Melanie Fones	Carbon Fund Facilitator

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## Awarded Projects: Micro

### Colleges Nine and Ten Garden Project: \$3,500



A team of UCSC students and staff members have received a Carbon Fund grant to construct a garden for Colleges 9 and 10. The purpose of the garden project is to create an awareness of sustainable agriculture and food systems in the College 9/10 community. The team plans to incorporate the themes of the colleges— social justice, community, and international perspectives— in order to create a space focused on food justice and cultural diversity. The garden will also help reduce our university's carbon footprint through carbon sequestration processes such as, composting, cover cropping, and tree planting.

### Ecotopia House: \$2,500



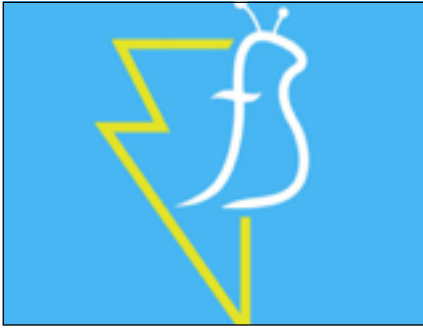
The UCSC-Cabrillo College Ecotopia House is a "tiny house" designed to minimize residential ecological footprint through both construction and operation. The project team has been awarded a Carbon Fund grant to help construct a low-cost, net-zero energy home that is easily reproducible, uses recycled materials where possible, and provides housing with as little environmental impact as possible. Ultimately, this project aims to research new sustainable technologies and techniques for reducing residential greenhouse emissions.



### Electric-Assist Bicycle for EH&S Staff: \$3,850

The UCSC Environmental Health and Safety (EH&S) department has received a Carbon Fund grant to purchase electric-assist bicycles for on-campus travel. The department has a decentralized office space and staff members frequently have to make trips across campus. The use of an electric-assist bicycle will allow the staff to conduct ongoing, frequent trips throughout campus in a low carbon-intensive manner. It will also serve as a pilot project for the potential of other departments adopting the use of an electric-assist bike for on-campus travel. It is estimated

that the use of the bicycle will save the department 170 gallons of gasoline a year, which corresponds to an annual CO2 reduction of 1.6 tons.



### **FSAE Electric Vehicle Competition: \$4,000**

Formula Slug, an electric FSAE group of mechanical and electrical engineers at UCSC, is developing a formula style racing vehicle to compete in the the annual FSAE competition. The purpose of this project is to develop an electric vehicle for competition in order to reduce carbon emissions, as well as reveal the potential of EVs to universities nationwide. The team also hopes that this project will serve as a model for the advancement of electric vehicles in the motor industry and spread awareness about EVs to the public.



### **Gaia Magazine Issue VIII: \$1,500**

Gaia is a student-run magazine at UCSC that provides coverage of sustainability-related issues and initiatives on, or linked to, the UCSC community. Gaia also strives to promote sustainability by printing locally on recycled paper, using soy based ink, and publishing online. The organization has been awarded a Carbon Fund grant to publish Issue VIII, which will focus on inspiring readers to reduce their impact on the environment through their daily actions. The group anticipates that the issue will motivate readers to reduce their energy usage, and thus carbon footprint.



### **Sustainable Exhibition Lighting: \$3,000**

Porter College's Sesnon Gallery has been awarded a Carbon Fund grant to replace the current halogen lights to LED lights. The lighting systems in the art galleries date back to the 1970's and a retrofit will provide a better working system for the galleries needs. Replacing the halogen lights with energy-efficient LED lights will decrease the university's energy consumption and electricity costs as well. It is estimated that the lighting retrofit will save the university 5,250 kWh and \$3,000 annually.



### **Global Student Embassy: \$1,800**

Global Student Embassy (GSE) is a program that aims to educate youth about local and global environmental issues centered around agriculture, as well as cultivate socially constructive, international relationships among the world's youth. GSE combines reciprocal international service-learning exchanges with year-round local programming that focuses on youth empowerment, leadership, and stewardship. In the past few years, GSE has been able to launch their program and construct organic gardening spaces at Santa Cruz High, Harbor High, and Soquel High through Carbon Fund grants. GSE has been awarded a Carbon Fund grant this year to further develop their gardens in

order to educate students about how organic farming can reduce the world's carbon footprint.



### **Green Office Certification Program: \$1,000**

The Green Office Certification Program is a student-led initiative that works to help offices on the UCSC campus implement sustainable practices in their daily operations. The Green Office team performs energy audits and waste assessments in campus offices in order to identify ways to lower their energy and waste consumption, as well as improve their overall environmental performance. The team has been awarded a Carbon Fund grant to provide energy saving smart strips to 30 participating offices on campus. It is estimated that the implementation of thirty smart strips will save the UCSC campus approximately 4,500 kWh a year.



### **Increasing Compost Education: \$3,000**

The Program in Community and Agroecology (PICA) is an educational community focused on sustainable agriculture and community building. PICA offers weekly and quarterly student-led workshops to teach students organic gardening and sustainable living skills. PICA's Carbon Fund grant will help support and expand their current compost education program. The project's goal is to increase education on campus about composting, as well as divert food waste from landfills. The funds will give PICA's compost coordinator the opportunity to offer compost education workshops and composting supplies, such as

worm bins, to students. It is predicted that the program will reach over 170 students and divert 9,420 pounds of food waste from landfills.





### **Atomic Defects in Solar Cell Perovskites: \$1,100**

A group of UCSC chemistry students have been awarded a Carbon Fund grant to research the role of atomic level defects in perovskite solar cells. Perovskite cells are an emerging technology that could be a viable alternative to the use photo-voltaic cells in solar panels. The efficiency of perovskite solar cells has been recorded as high as 21%. Compared to an efficiency of 11%-15% for a current market photo-voltaic cell. Solar cell perovskites are highly efficient and relatively easy to manufacture, however, they are very reactive to their environment. The goal of the team's research is to address the issues of stability of perovskites by understanding the role of atomic level defects in the solar cell in

order to further the advancement of perovskite solar cells.



### **UCPD Patrol Bicycle Program: \$4,950**

The UCSC Police Department has been awarded a Carbon Fund grant for the purchase of three bicycles to use for police patrol. The use of bicycles for police patrol will reduce the department's vehicle usage and carbon footprint, as well as improve campus security. For instance, bike patrol provides greater accessibility to areas that are not reachable by vehicle and creates a higher visibility and approachability for the officers and student ambassadors. UCPD estimates that utilizing bicycle patrol will save the department approximately 12 gallons of gasoline a day,

which corresponds to an annual CO2 savings of 40 tons.



### **Clean Oceans Project: \$1,000**

Clean Oceans International (COI) is a local non-profit organization focused on decreasing the amount of plastic pollution in the ocean. COI has developed plastic-to-fuel technology that has the potential to drastically reduce the amount of plastic in the ocean, as well as provide communities with an alternative waste management system. A team of UCSC students have partnered with COI to research the productivity, efficiency, safety, and quality of the emerging technology. The students have been awarded a Carbon Fund grant to fund their research and further the advancement of plastic to fuel technology.



### **Arboretum Greenhouse Power System: \$2,500**

A team of UCSC students have been awarded a Carbon Fund grant to install a new power system in two Arboretum greenhouses. The Arboretum greenhouses have recently been approved as a space for working on sustainability projects, as long as the site remains off the grid and utilizes low voltage DC power. However, the current power system in the Arboretum is less than 1 kW, so the number of projects that can be done in the greenhouses are limited. The team plans to install energy efficient DC pumps and LED lighting in one of the greenhouses and a solar system on the other to allow students to work on projects related to aquaponics, bioaponics, urban agriculture,

biogas, and biofuel.

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## Awarded Projects: Macro



### **Zero Waste at the Resource Centers: \$2,000**

The Ethnic Resource Centers, Women's Center, and Cantu Queer Center have been awarded a Carbon Fund grant to make the ERC office and Resource Center events zero waste. Their grant will be used to implement two zero waste stations in the ERC's office, as well as at their events. Ultimately, this project will reduce the campus' GHG emissions and contribute to the UCSC Zero Waste by 2020 goal. It is estimated that the project will divert 50,911.16 pounds of waste from the landfill, and save 3.72 tons CO<sub>2</sub>e. This project will also share sustainability practices to students, helping contribute to larger behavioral changes throughout UCSC.



### **Fleet Services EV Charging Stations: \$10,000**

UCSC Fleet Services has been awarded a Carbon Fund grant to help reach the UC Carbon Neutrality Initiative for transportation. The proposed Sustainable Transportation Policy calls for 50% of light-duty vehicle to be zero emissions by 2025. However, the Fleet Services Central Garage does not have adequate infrastructure to support the addition of more electric vehicles on campus. Their Carbon Fund grant will be used to install 3 2-level chargers that will support the department's growing EV fleet now and in the future. It is estimated that the project will save 1800 gallons of gasoline a year.



### **Ground Services Electric Leaf Blowers: \$8,400**

Ground Services has been awarded a Carbon Fund grant to purchase 100% carbon neutral blower equipment. Last year, ground services received a grant to begin replacing their two-stroke gas/oil mix leaf blowers with electric blowers. This year's grant will be used to replace their remaining two-stroke blowers with battery powered blowers. Two-stroke blowers produce a significant amount of greenhouse gas emissions and other pollutants. Replacing all of the two-stroke blowers with electric will save 2.4 tons of carbon emissions a year.



### **Graduate Student Common Lighting Retrofit: \$7,500**

The Graduate Student Common (GSC) has been awarded a Carbon Fund grant to continue energy efficiency in the restaurant space occupied by Cafe Iveta. Their Carbon Fund grant was used to retrofit this restaurant space into a green building with energy efficient lighting. It is estimated that the green retrofit of the entire restaurant will save 9.6 tons of carbon emissions a year.



### **Microscopy Facility LED Light Source Upgrade: \$6,500**

The UCSC Microscopy Facility has been awarded a Carbon Fund grant to replace their existing microscope light sources with LEDs. The new LED light sources are more energy efficient, convenient to use, and are also mercury free unlike the older technology used before. The retrofit is estimated to save over 750 tons of CO<sub>2</sub>e.



### **Porter Dorms Stormwater to Toilet: \$17,000**

A team of UCSC students and faculty have been awarded a Carbon Fund grant to use rainwater capture for toilet flushing in the Porter dorms. In 2011, the Porter dorms were renovated to include dual piping for non-potable water toilet flushing. This project will reduce the dorms potable water usage by nearly 25% annually, as well as contribute to our campus' green infrastructure. It is also estimated that the project will save 15.7 tons of CO<sub>2</sub> annually. This project is not only a turning point for UCSC, but the entire UC system as well.



### **Green Labs Equipment Retrofit Fund: \$17,000**

The UCSC Sustainability Office student led program, Green Labs, was awarded to start an equipment retrofit fund. Labs account for over half of the energy use on campus, which is partly due to their outdated and inefficient equipment. The cost of this equipment is often a barrier that prevents labs from upgrading to more energy efficient equipment and appliances. This fund will provide Green certified labs with a funding source for energy-efficient equipment lab equipment such as freezers, centrifuges, and incubators. It is estimated that this project will save 4.76 tons of carbon emission a year.



### **Calabasas Elementary Rainwater Catchment: \$11,990**

College Nice and Ten have been working with Calabasas Elementary parents and staff to create a community garden at the school, a place where food insecure families within access to land can acquire a plot to cultivate, and where culturally relevant food can be produced as a collective. The Carbon Fund awarded this project funds to help build a water catchment system as part of their growing community space.



### **Sustainability Field Deployment: \$5,000**

A group of UCSC faculty, staff, and students have been awarded a Carbon Fund grant to further advance the Sustainability Studies minor at UCSC. The Sustainability Studies minor is at the end of its 2-year pilot phase and insufficient funding is a limiting factor in the continuation of the curricula. This grant will provide funding for the minor to continue for the next two years. Moreover, the grant will continue to support some of the minor's current projects, including the deployment of smart irrigation monitoring and control systems, as well as climate and solar radiation monitoring networks.



### **Water Lab: \$7,000**

A team of UCSC students and faculty have been awarded a Carbon Fund grant for their Water Lab. This project aims to develop a prototype for a decentralized wastewater treatment/reuse system, combined with a decentralized renewable-energy micro-grid. If successful, the project could spur the development of potable reuse systems that reduce the GHG footprint of wastewater treatments and extend wastewater treatments to many unserved parts of the world. It is estimated that the full system will save 13 tons of carbon emissions a year.

# Executive Summary

Total Amount Requested	\$363,674
Total Micro Amount Requested	\$65,227
Total Macro Amount Requested	\$298,447
Total Funds Available 2015-2016	\$133,477
Total Allocated to Micro Grants	\$34,700
Total Allocated to Macro Grants	\$97,590

The Carbon Fund strives to implement our mission statement and allocate funds through strenuous processes including: research on calculated life span of projects, carbon mitigation calculations, and cost per ton of carbon saved. In addition, we have other criteria to ensure a diversity of projects and project strength, including: project feasibility, project implementation plan, metrics and reporting, student involvement, direct savings aspect, quality budget, etc.

**C02 Saved (Tons)**

