

**NC STATE** UNIVERSITY




# **ANNUAL SUSTAINABILITY REPORT**

FISCAL YEAR 2015-2016





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Thanks to our impact-driven students, faculty and staff, NC State has emerged as a national model of sustainability and a leader in creating sustainability solutions. This report showcases some of the most successful sustainability progress from the last fiscal year and, most importantly, the spirit of innovation, collaboration and purpose that permeates our university community and fuels our vision for a more sustainable future.



Randy Woodson  
NC State Chancellor

## FROM THE NC STATE SUSTAINABILITY COUNCIL

In this final implementation year of NC State's inaugural Sustainability Strategic Plan, the university's ongoing sustainability efforts have boosted sustainability interest and momentum to new heights. Since the plan's development in 2011, sustainability has become increasingly integrated in the university's planning and operations, research, teaching and outreach.

This Annual Sustainability Report reflects progress in year five (July 1, 2015 to June 30, 2016) of the university's 2011-2016 Sustainability Strategic Plan. The accomplishments in academics and research, community and culture, energy and water, purchasing and waste reduction, green development and transportation are the result of growing campus-wide collaboration around sustainability.

Produced by the University Sustainability Office, this is the first report issued by the university's Sustainability Council, which was established in 2015 to build on the success of the Campus Environmental Sustainability Team that developed and implemented much of the university's first Sustainability Strategic Plan.

We celebrate this year's many accomplishments and look forward to accelerating this progress with the implementation of NC State's second Sustainability Strategic Plan, which will guide the university's sustainability efforts from July 1, 2017 through June 30, 2022.

Jack K. Colby  
Co-Chair, Sustainability Council  
Assistant Vice Chancellor for Energy Systems  
Chief Sustainability Officer

Stephen Kelley  
Co-Chair, Sustainability Council  
Professor, Department of Forest Biomaterials

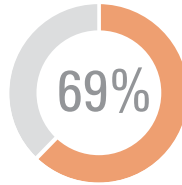
Tracy Dixon  
Director, University Sustainability Office

# NC STATE SUSTAINABILITY HIGHLIGHTS

JULY 1, 2015 — JUNE 30, 2016



NC State earned a **Gold Rating** from the Association for the Advancement of Sustainability in Higher Education (AASHE). AASHE's Sustainability Tracking, Assessment and Rating System (STARS) is the most widely recognized international framework to measure sustainability performance in higher education.



Percent of incoming students in 2015 for whom **NC State's sustainability commitments influenced their decision** to attend the university.



**NC State Sustainability Council** launched as new campus-wide advisory committee charged with advancing university sustainability.



**Campus events** were sustainability-related or certified for sustainable practices in fiscal year 2016.

Campus **energy consumption** since 2003:



Campus **water consumption** since 2002:



**Greenhouse gas emissions** since 2008:



Savings from **recommissioning** program since 2014:

**\$1.9 MILLION**

**Reuse water** pipeline installed on Centennial Campus.

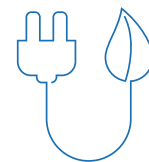


**3.22 MILLION**

Passenger boardings on the **Woffline campus bus** system — a new record.



NC State earned Gold designation as a **Best Workplace For Commuters**.



Two new **electric vehicle charging stations** installed on campus.

15

Campus workplaces achieved certification for sustainable practices.



New sustainability **high-impact experiences** for students:

- Make-a-thon innovation challenge
- Sustainability category in campus entrepreneurship competition
- Environmental justice tour of eastern North Carolina

\$161,000

in campus grants from the **NC State Student Sustainability Fund** awarded to 15 projects in 2016.



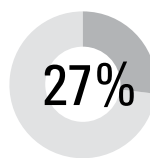
Student-led effort resulted in **removal of plastic bags** from campus dining and convenience stores.

320 BAGS

of compost collected by volunteers in the university's first season offering **composting at home football games**.

 48.5%

Overall landfill **diversion rate** due to recycling, composting and reuse programs.



27%

**Locally-grown food** purchased by NC State Dining, including 4,189 pounds of campus-grown food.

 951,203  
GROSS SQUARE FEET

Total amount of campus building space that is **Leadership in Energy and Environmental Design (LEED)** certified, including this fiscal year's certifications: Carol Johnson Poole Clubhouse and Talley Student Union.

**BSC**

Poole College of Management expanded sustainability efforts with its **Business Sustainability Collaborative**.



Inaugural undergraduate awards for **sustainability-related research** offered.

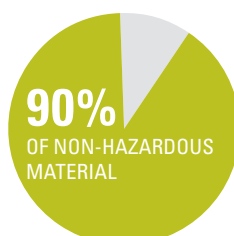


First **sustainability-related career fair** offered on campus with 40 employers and 450 students attending.



Spring 2016 marked the inaugural cohort of undergraduates studying coastal and environmental issues at NC State's Center for Marine Sciences and Technology through **Semester @ CMAST**.

Waste diversion goal for the deconstruction of **Harrelson Hall**:





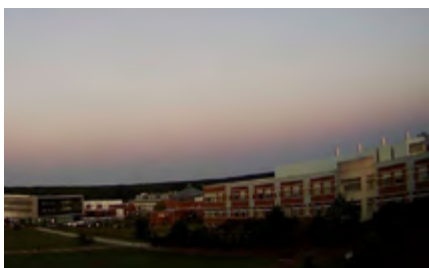
# ACADEMICS AND RESEARCH

## PREPARING STUDENTS AND INNOVATIONS THAT CREATE A MORE SUSTAINABLE WORLD

As a preeminent research university preparing tomorrow's workforce, NC State is committed to academic excellence and research that improves the world. By educating about sustainability, students are better prepared for the complex social, environmental and economic challenges that the future holds.



### 2015-2016 RESEARCH SNAPSHOTS



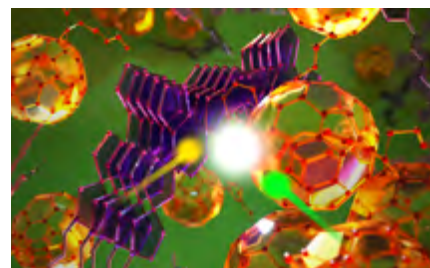
#### **Watch the Weather**

In spring 2016, real-time weather stations launched atop NC State's Engineering Building 2 and at Bald Head Island. The College of Sciences uses the station to study climate impacts.



#### **Efficiencies Could Boost Manufacturing**

College of Textiles professor Abdel-Fattah Mohamed Seyam is studying improvements in textile weaving efficiencies that could drive down manufacturing costs associated with U.S.-based textile production.



#### **Nuclear, Solar Advances Energy Future**

With renewed funding for the Consortium for the Advanced Simulation of Light Water Reactors, NC State researchers will continue exploring safer and more economical nuclear power. Several researchers are also exploring how to improve efficiencies of solar energy.





### ***B Corps Clinic Connects Students, Startups***

*Forty-four students from NC State and other area universities participated in the B Corps Clinic that advised 10 local startup companies on how to improve their environmental and social impact while earning certification as a B Corporation. Led by the Poole College of Management's Business Sustainability Collaborative, the clinic is a collaboration with HQ Raleigh, Entrepreneurship Clinic, Net Impact, UNC Chapel Hill, Duke University and the SKEMA Business School.*



### **OffShore Wind Energy Must Not Alter Views**

Research from the College of Agriculture and Life Sciences' Center for Environmental and Resource Economic Policy showed that wind turbines could negatively impact N.C. coastal tourism unless placed more than eight miles offshore.



### **Program Helps Families Access Food**

The North Carolina Cooperative Extension developed the "More in My Basket at the Market" program to show recipients of the Supplemental Nutrition Assistance Program (SNAP) how to maximize purchases at local farmer's markets in order to create nutritious meals.



### **Teens Care About Climate Change**

College of Natural Resources research found that concern about climate change was linked to whether students had a personal belief in human-caused climate change and how often they discussed the topic with family and friends – even those who disagreed.



# 2015-2016 HIGHLIGHTS



## POOLE COLLEGE LAUNCHES BUSINESS SUSTAINABILITY COLLABORATIVE

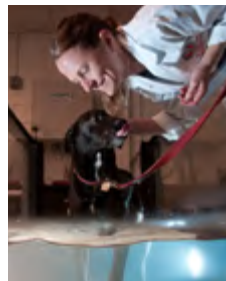
After launching in 2013, Poole College of Management's Sustainability Initiative was renamed the Business Sustainability Collaborative (BSC) in August 2015. With its first five-year strategic plan, the BSC began working to fulfill its mission of preparing the next generation of leaders by engaging students, faculty, and the local and global business communities to drive positive business results. BSC launched its Associates leadership program for students, expanded waste reduction efforts in Nelson Hall, started the B Corps Clinic that pairs students with local startup companies looking to advance sustainability efforts, advised the expanding Net Impact student chapter, hosted 14 events, provided \$65,000 in sustainability grant funding for faculty research and awarded two grants to expand sustainability throughout the college's curriculum.



## STUDENTS ENGINEER SUSTAINABLE SOLUTIONS

As part of a capstone design experience, more than 50 senior biological and agricultural engineering students developed 13 designs that address environmental problems, including stream restoration at a local neighborhood development and stormwater management in a mall parking lot and local park.

## INSTITUTE LAUNCHES TO BRIDGE GAP BETWEEN HUMAN, ANIMAL HEALTH



Beginning in October 2015, NC State's Comparative Medicine Institute aids in translating basic research into clinical applications that will improve the health of both people and animals.



## VET, DESIGN STUDENTS COLLABORATE FOR WILDLIFE HEALTH

For two years, 30 landscape architecture and veterinary medicine students designed and built Wolf Prowl, a campus structure through which College of Veterinary Medicine students and faculty can better meet the health needs of wildlife patients.



## CLASS CONFRONTS CONSERVATION REALITIES

A group of graduate College of Natural Resources students are amid a five-year tour of U.S. cities facing urban conservation challenges. Their 2016 trip toured biodiversity in Chicago.

## UNIVERSITY OFFERS FIRST SUSTAINABILITY CAREER FAIR

More than 40 employers and 450 students participated in NC State's first Sciences, Sustainability and Environmental Career Fair on Oct. 20, 2015.

## SUSTAINABLE ENERGY CONNECTS U.S., AFRICAN RESEARCHERS

Under the leadership of College of Engineering professor Veronica Augustyn, NC State students are helping create research experiments on materials for sustainable energy. These kits are shipped to universities in Africa, where researchers are engineering solutions for Africa's energy future.



## Revitalizing Rural Schools

Since 2010, the College of Education's Northeast Leadership Academy has awarded \$14 million in grants to research and to create strong leadership for under-resourced rural school districts.



## Recycle That Water

College of Humanities and Social Sciences and College of Engineering faculty co-researched water reclamation and how to overcome public resistance to using reclaimed water, which is treated but not potable.



## Bike Signs Could Improve Cycling Safety

Changing the wording of a traffic sign – from "Share the Road" to "Bicycles May Use Full Lane" – could help clarify road rules for bicyclists and motorists, according to a College of Natural Resources study.





### TEXTILE PROGRAM EMPOWERS WOMEN, SERVICE

Home bedding company Nextt and College of Textiles students are working with Hunar, a grassroots women's collective in India, to design products using local textile traditions and Indian resources while introducing modern, sustainable and appropriate concepts of textile design and manufacturing. Teams of undergraduate and graduate students guided by faculty are developing initial product designs. While much of the collaboration occurs virtually, NC State students and faculty also traveled to India in March 2016 for a firsthand look at the impact of their work.

### WINNER OF 30-MINUTE THESIS COMPETITION DISPLAYS SUSTAINABILITY RESEARCH

Graduate student Haritha Malladi took first prize with her research entitled *Reduce and Recycle: How to Turn Our Black Roads Green*.



### INTERNSHIPS ALLOW STUDENTS TO EXPLORE PLANT POWER

In summer 2015, 40 student interns worked with NC State researchers on the Plant Pathways Elucidation Project that explores ways to harness plants' benefits for human health.



### SUSTAINABILITY IS JUST A CLICK AWAY

The university's sustainability website added databases of sustainability-related courses, degree programs and researchers at [sustainability.ncsu.edu/curriculum-research](http://sustainability.ncsu.edu/curriculum-research).



### STUDENTS SPEND SEMESTER AT N.C. COAST

In the Spring 2016 semester, the inaugural cohort of undergraduates studied at NC State's Center for Marine Sciences and Technology (CMAST), based in Morehead City, N.C. In addition to marine and coastal-specific courses, students had access to a wide variety of high-impact learning experiences that furthered their knowledge of environmental issues impacting coastal and marine resources.

### FACULTY PREPARE TO INTEGRATE SUSTAINABILITY INTO CLASSROOMS

Eight NC State faculty members attended the inaugural Sustainability in Teaching and Practice Academy offered in October 2015, by the Office of Faculty Development, University Sustainability Office and Poole College of Management's Business Sustainability Collaborative.

### UNDERGRADUATE RESEARCHERS EARN SUSTAINABILITY HONORS

NC State's inaugural Outstanding Sustainability Research Award was presented to Hallie Hartley, Stephanie Wenclawski and Luis Roldan at the 2016 Undergraduate Research Symposium.



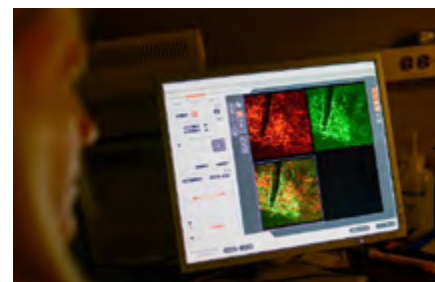
### Biobased Products Boost U.S. Economy

A Poole College of Management report indicated that the biobased products industry contributes \$369 billion and 4 million jobs to the U.S. economy.



### Resurgence of 'Black Lung'

A College of Humanities and Social Sciences doctoral student seeks answers on why "black lung" is back on the rise among Appalachian coal miners.



### Health Impact of Personal Care Products

College of Sciences professor Heather Patisaul studies how endocrine-disrupting chemicals – often found in consumer products – mimic hormones and lead to adverse developmental effects in humans and animals.

# PROGRESS TOWARD STRATEGIC GOALS

**STRATEGY 1:** Develop the scholarship, including the courses, curricula and research needed for students to become literate about energy, environment and sustainability.

**TACTIC:** Develop and implement a first-year interdisciplinary Environmental Sciences Program.

**PROGRESS:** Developing and implementing the First Year Environmental Program is an initiative of university's Pathway to the Future Strategic Plan. Discussion about its implementation will continue through 2017.

**TACTIC:** Launch the Semester at CMAST (Center for Marine Sciences and Technology) program.

**PROGRESS:** Spring 2016 marked the first cohort of undergraduate students participating in this semester-long, academic coastal and marine program at NC State's Morehead City, N.C.- based facility. With seed funding from the Provost's Office, the program offers NC State student participants high-impact learning opportunities and courses taught by coastal experts, as well as courses not offered on the university's Raleigh campus.

**TACTIC:** Offer a new General Education Program (GEP) course on water and the environment.

**PROGRESS:** Environmental Sciences now offers Water and the Environment (ES 150) as an Interdisciplinary Perspectives course.

**TACTIC:** Create an Academics working group within the NC State Sustainability Council.

**PROGRESS:** An Academics working group was created under leadership of Dr. Morton Barlaz (College of Engineering) and Dr. Walter Robinson (College of Sciences). The membership of the working group represents each academic college in the university.

**STRATEGY 2:** Explore the concepts underlying sustainability in courses and curricula to build the case for sustainable practices.

**TACTIC:** Publish NC State's Sustainability Tracking and Reporting System (STARS) sustainability course list and degree programs publicly and have Masters in Accounting students audit the information's accuracy.

**PROGRESS:** The university's database of sustainability courses and degree programs is available at [sustainability.ncsu.edu](http://sustainability.ncsu.edu). The subset of courses and degrees that qualify for inclusion as part of NC State's STARS submission -- which led to the university's Gold rating for sustainability -- are indicated. Teams from the Masters of Accounting Program applied auditing skills to this real-world scenario and expanded their knowledge about sustainability by auditing the database.

**TACTIC:** Within the Poole College of Management's Business Sustainability Collaborative (BSC), increase the number of courses at the undergraduate and graduate level that include sustainability content by integrating sustainability into existing courses and developing new stand-alone courses.

**PROGRESS:** BSC awarded two curriculum development grants, totaling \$7,000. Since the BSC's launch in 2013, 15 curriculum development grants totaling \$79,000 have been awarded to faculty, resulting in sustainability content exposure for 1,682 students. Additionally, two dozen courses that include sustainability content have been mapped across the college's concentrations and programs.

**STRATEGY 3:** Engage in discussions for advancing sustainability to optimize the use of energy, water, buildings, land, transportation and existing space through participation in the Campus Environ-

mental Sustainability Team (CEST) working groups.

**TACTIC:** Expand classroom summer energy saving initiative to drive additional energy savings in unoccupied classrooms.

**PROGRESS:** The third summer of the classroom energy saving initiative resulted in savings totaling \$87,000. Software that would enable year-round program expansion will be explored for its viability on campus.

**STRATEGY 4:** Use the physical campus as a classroom and research facility to demonstrate and explore sustainability principles and practices.

**TACTIC:** Evaluate the best path forward to further PackLink as the source for real-world, sustainability project learning and experiences.

**PROGRESS:** Software and program structuring will be explored so that PackLink is best integrated with academic systems/programs. Future goals include making it available for classes or groups and incentivizing departmental participation.

**STRATEGY 5:** Promote research to advance sustainability, including discovery of new technologies that advance sustainability, securing patents and employing new workers that align with a new energy economy.

**TACTIC:** Publish NC State's Sustainability Tracking and Reporting System (STARS) database of sustainability researchers and have Masters in Accounting students audit the information's accuracy.

**PROGRESS:** The sustainability researchers are publicly available at [sustainability.ncsu.edu](http://sustainability.ncsu.edu) and in NC State's 2016 STARS online report. Teams from the Masters of Accounting Program applied auditing skills to this real-world scenario and expanded their knowledge about sustainability by auditing the database.

**TACTIC:** Within the Poole College of Management's Business Sustainability Collaborative (BSC), provide resources and support for sustainability-related research with a focus on industry engagement and application.

**PROGRESS:** BSC awarded \$65,000 in research grant funding. To date, research grant funding tops \$217,000 that funded 8 research teams, supported 16 faculty researchers and sparked the development of four working academic journal articles.

**STRATEGY 6:** Engage faculty researchers in sustainable practices to increase the resource use efficiency of research equipment and spaces needed to conduct state-of-the-art research.

**TACTIC:** Strategy 3 tactics worked toward this strategy but no other progress was made.

**PROGRESS:** No progress to report.

**STRATEGY 7:** Provide opportunities for service learning that bridge education, research and the practical application of sustainability.

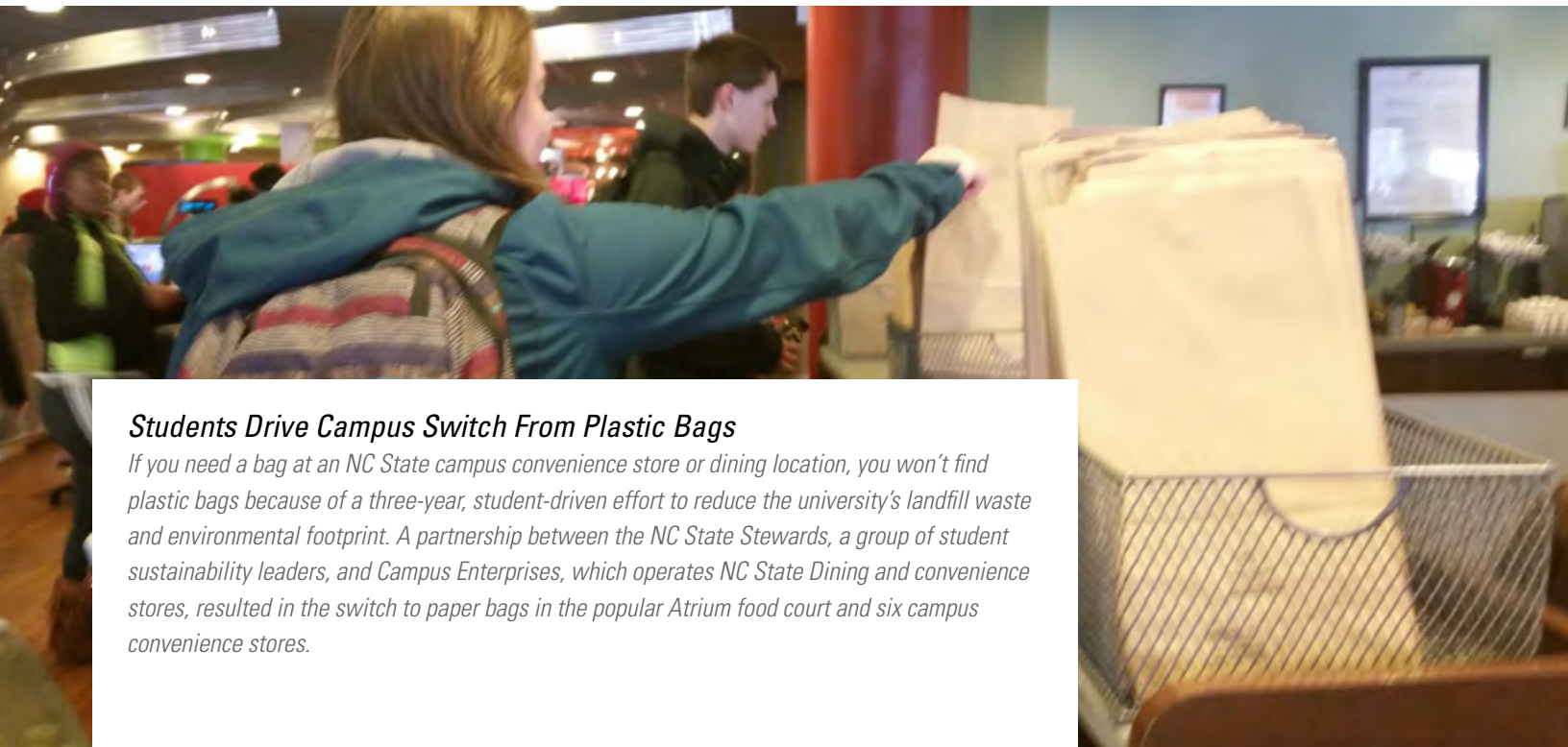
**TACTIC:** Launch the Sustainability Academy to provide tools and resources for faculty to incorporate sustainability into teaching, toward the long-term goal of a faculty sustainability learning community.

**PROGRESS:** The first Sustainability in Teaching and Practice Academy was held during fall break 2015. The program was sponsored by the Office of Faculty Development, the University Sustainability Office and the Poole College of Management Business Sustainability Collaborative. Future academies are planned.

# PURCHASING AND WASTE REDUCTION

## STRIVING FOR SUSTAINABLE MATERIALS AND ZERO WASTE ON CAMPUS

A university needs resources. At NC State, sustainability starts at the source as more economically, environmentally and socially beneficial products make their way on campus. When these resources reach the end of their useful life, the university's robust waste diversion program reduces campus waste through recycling, reuse and composting programs.



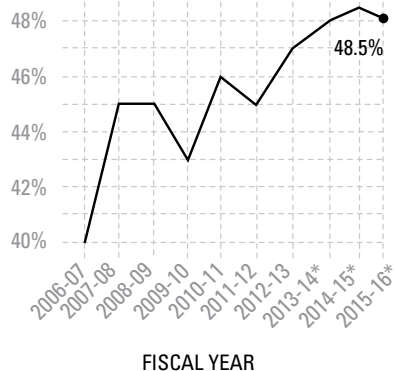
### ***Students Drive Campus Switch From Plastic Bags***

*If you need a bag at an NC State campus convenience store or dining location, you won't find plastic bags because of a three-year, student-driven effort to reduce the university's landfill waste and environmental footprint. A partnership between the NC State Stewards, a group of student sustainability leaders, and Campus Enterprises, which operates NC State Dining and convenience stores, resulted in the switch to paper bags in the popular Atrium food court and six campus convenience stores.*



# 2015-2016 HIGHLIGHTS

## PERCENTAGE OF CAMPUS WASTE DIVERTED FROM LANDFILL



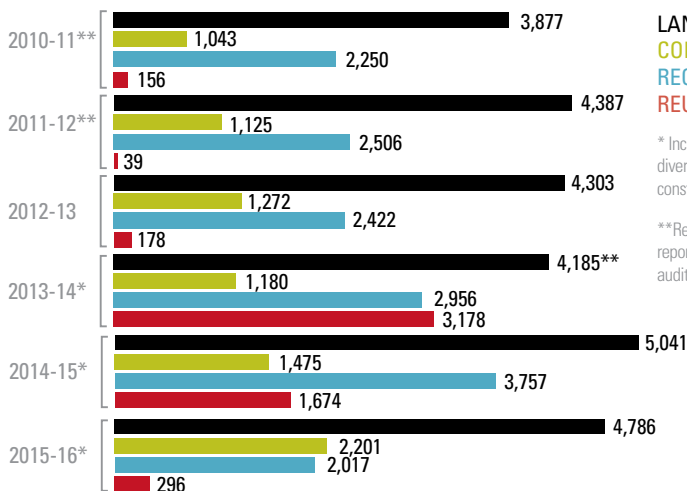
\*Indicates that recycling and diversion rates from small construction projects were tracked and reported.



## CARTER-FINLEY STADIUM IMPLEMENTS COMPOSTING

NC State Athletics and NC State's Waste Reduction and Recycling Office collaborated on a concourse-level stadium composting program, which allowed fans to compost food waste and other organic material from each game. With about 320 bags of compost collected during the 2015 season, an expansion of composting efforts is planned for the 2016 football season.

## TONS OF CAMPUS MATERIAL RECYCLED, COMPOSTED, REUSED AND LANDFILLED



LANDFILLED  
COMPOSTED  
RECYCLED  
REUSED

\* Includes landfill, recycling and diversion amounts from small campus construction projects.

\*\*Reflects change in previously-reported numbers, which have been audited internally for accuracy.



## SOLAR-POWERED COMPACTORS ADDED

After a successful proof-of-concept project funded by the NC State Sustainability Fund, additional solar landfill and recycling compactors were installed by student group Students4Solar, University Recreation and at Talley Student Union. These compactors use solar energy to compress waste and reduce the frequency at which a landfill or recycling receptacle must be emptied.



## Kappa Delta Wins Campus RecycleMania

During this annual collegiate recycling competition, students living in residence halls and in Greek Village competed for five weeks to reduce waste. Kappa Delta won with a 45% diversion rate.



## Data Study Drives Waste Strategies

In 2015, a campus Waste Characterization Study examined waste-to-landfill dumpsters for select campus buildings. The findings informed new waste reduction strategies and is a baseline for measuring progress.



## Pizza Box Composting Tops 26,000 Boxes

In its third year, 12,890 pizza boxes were added to the overall composting total for the program, which was featured in a November 2015 article by the *Wall Street Journal*.



### TALLEY STUDENT UNION SHOWCASES AQUAPONICS DISPLAY

In June 2016, Talley Student Union began hosting a student-designed aquaponics system to showcase one of the state's fastest-growing agriculture practices. With funding from the NC State Sustainability Fund, the Recirculating Farms Club built the 800-gallon system, which grew lettuce for University Dining's use in Talley's 1887 Restaurant.

### PROJECT REDUCES TEXTBOOK USE

To increase college affordability and reduce paper use, NCSU Libraries began awarding grants in fall 2014 to faculty to adopt, adapt or create free or low-cost alternatives to expensive textbooks. In the program's second year, 13 faculty members required 9 fewer textbooks, saving an estimated \$250,000 in student textbook costs.



### AGROECOLOGY FARM BOASTS GROWTH

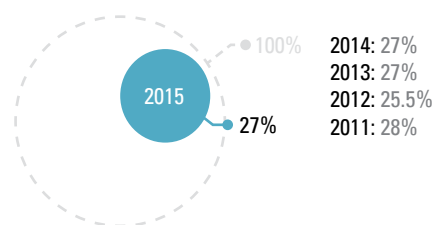
In 2015, this NC State farm provided 4,139 pounds of produce to University Dining for use in campus dining halls. With the addition of a season-extending stationary high tunnel, the amount of campus-grown produce sold to University Dining is expected to grow by at least 25 percent. The farm is also an educational resource, incorporated into the curriculum for 11 NC State courses in 2015.

### RECYCLING STREAMLINED AT RESIDENCE HALLS

At most outdoor recycling stations located near residence halls, NC State Waste Reduction and Recycling replaced blue recycling bins and cardboard dumpsters with a green recycling dumpster that accepts multiple types of recyclable material, creating greater convenience and efficiency.



### LOCAL FOOD SERVED IN CAMPUS DINING HALLS



### Sustainable Plants At Chancellor's Residence

In summer 2015, NC State's Grounds Management and Agroecology Education Farm provided hundreds of plants for seasonal landscaping at The Point. A student grew the plants with organic fertilizing techniques.



### Technology Creates Paper Reductions

The Office of Information Technology launched a document management system in several major university departments allowing for secure digital document retention, efficiency, storage savings and easier access.



### Wolfpack Helps Community Recycle

NC State's annual shredding and recycling drive in March 2016 had more than 260 participants who recycled 20,045 pounds of materials and 3,764 plastic bags.

# PROGRESS TOWARD STRATEGIC GOALS

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**STRATEGY 1:** Instill the values of total cost of ownership and total life cycle costing into purchasing and project decision making.

**TACTIC:** Work with strategic sourcing analyst and MarketPlace suppliers to highlight sustainable items.

**PROGRESS:** Suppliers report annually to Purchasing their sustainable items purchased by NC State.

**STRATEGY 2:** Achieve a 60 percent landfill diversion rate by 2015 with a stretch goal of achieving a 65 percent diversion rate by 2015.

**TACTIC:** Further institutionalize zero waste programs throughout campus through programs such as the mini-bin pilot initiative, zero waste Athletics efforts, event waste diversion efforts, removal of extraneous trash cans and development of a zero waste program within the Poole College of Management.

**PROGRESS:** Developed a Zero Waste Workplace pilot program that was initiated in summer 2016 in Administrative Services III building. The pilot program continues into fiscal year 2017. Poole College of Management has developed a Zero Waste Program for Nelson Hall. Efforts to reduce waste associated with campus events and athletic events are ongoing.

**TACTIC:** Utilize the 2015 Waste Characterization Study to develop a Zero Waste Management Plan for campus.

**PROGRESS:** Zero Waste Management Planning will extend into fiscal year 2017.

**STRATEGY 3:** Implement source reduction and environmentally preferable purchasing initiatives to decrease waste before it occurs.

**TACTIC:** Educate the campus community about the sustainable procurement standard operating procedure (SOP).

**PROGRESS:** Future plans include sustainability SOP education as part of the QuickStart program, Marketplace training, vendor expo and the new Purchasing website.

**STRATEGY 4:** Increase the amount of environmentally and socially responsible materials purchased.

**TACTIC:** See tactic and update for strategy 1.

**PROGRESS:** See tactic and update for strategy 1.

**STRATEGY 5:** Implement sustainable purchasing standards.

**TACTIC:** Identify commodity categories to be used in bid documents and educate campus end users about including sustainability requirements.

**PROGRESS:** This tactic will be carried forward into fiscal year 2017.

**STRATEGY 6:** Develop a comprehensive closed loop program to capture organic waste (food waste, animal bedding, yard waste, etc.) for composting that can be used on campus.

**TACTIC:** Develop an on-campus composting site.

**PROGRESS:** Identified composting technology that would meet composting capacity goals for the next five years. Continue this goal into fiscal year 2017 to identify funding for design and construction.

**TACTIC:** Work with Grounds Management to develop a program for utilizing organic materials produced on campus as soil amendment. Identify locations for compost pilot program on campus.

**PROGRESS:** Grounds Management continues to expand integration of organic material and has reduced chemical application. Locations that now use organic material include Centennial recreation fields, Miller Field and Talley Student Union. During fiscal year 2016, Grounds Management used 180 cubic yards of compost and 1400 cubic yards of leaf mulch created on campus from campus leaves.

**STRATEGY 7:** Develop a more extensive outdoor walkway recycling program to capture additional recyclable materials and remove them from the waste stream.

**TACTIC:** Analyze benefits of currently placed solar-powered compactor units for further expansion.

**PROGRESS:** Additional solar-powered compactor units have been installed through funding from the NC State Sustainability Fund and through departmental funds. Analysis is complete, and a placement plan for future sites will be evaluated.

**STRATEGY 8:** Utilize modern waste collection concepts and practices to streamline services, improve programs, and increase operational efficiencies and customer service.

**TACTIC:** Utilize new measuring tools, such as FleetMind, to determine the nature of materials streams on campus so that meaningful reports can be created for campus customers and partners.

**PROGRESS:** Ongoing.

**TACTIC:** Create innovative educational training for campus recycling and compost users, including pre- and post- consumer.

**PROGRESS:** Occupants and visitors of Talley Student Union, the Oval Restaurant and Administrative Services III have received customized outreach material and messaging related to their building's waste reduction efforts. These outreach efforts will continue into fiscal year 2017 as the Zero Waste Workplace program continues into Administrative Services I and II buildings.

**STRATEGY 9:** Increase the partnerships among NC State, local farmers, producers and manufacturers in North Carolina, resulting in more sustainable food purchases by University Dining.

**TACTIC:** Increase amount of local and sustainable food purchased by University Dining.

**PROGRESS:** Local purchasing continues to build as University Dining's primary food vendor, US Foods, continues to increase its inventory of local products. Purchasing local is still the primary goal, along with supporting increased production at NC State's Agroecology Education Farm, which now has a season-extending high tunnel. University Dining plans to continue its partnership and investment in the farm for campus-grown produce. Dining also helped host a student-made aquaponics display in Talley Student Union, using some of the display's hydroponic produce in the campus' 1887 Restaurant.



# TRANSPORTATION

## PROPELLING SUSTAINABLE TRANSPORTATION

On a thriving campus, people are on the move. From work to class and everywhere in between, students, faculty and staff travel to, from and around campus. Every year, campus sustainable transportation options grow, reducing energy use and greenhouse gas emissions while creating a more pedestrian-friendly and less congested campus.



### ***Wolfline Breaks Ridership Record Again***

*For the second consecutive year, the Wolfline campus bus system has bypassed ridership records, boasting 3,220,569 passenger boardings during fiscal year 2016.*

# 2015-2016 HIGHLIGHTS

## ELECTRIC VEHICLE INFRASTRUCTURE EXPANDS

With the addition of two new electric vehicle charging stations at the Dan Allen Deck and Coliseum Deck, the total number of campus charging stations reached 22. The two new stations are funded jointly by NC State Transportation, the North Carolina Clean Energy Technology Center and the North Carolina Department of Transportation.



## ALTERNATIVE VEHICLES SHOWCASED

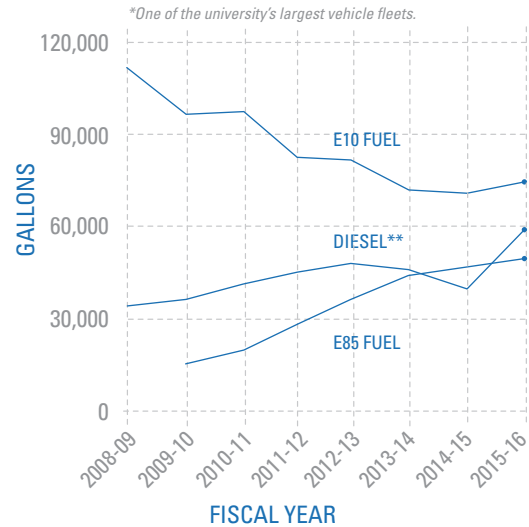
The Alternative Vehicle Showcase, which aimed to accelerate awareness of energy and energy-saving practices, featured more than a dozen sustainably-fueled vehicles displayed on the Brickyard.

## NC STATE GRABS GOLD RATING

In the Best Workplaces for Commuters' annual Race for Excellence Awards, NC State earned a Gold rating and ranked among the country's top 29 employers for exemplary efforts to offer sustainable transportation options such as vanpool, transit and telework. NC State is among just 10 universities to receive the honor.

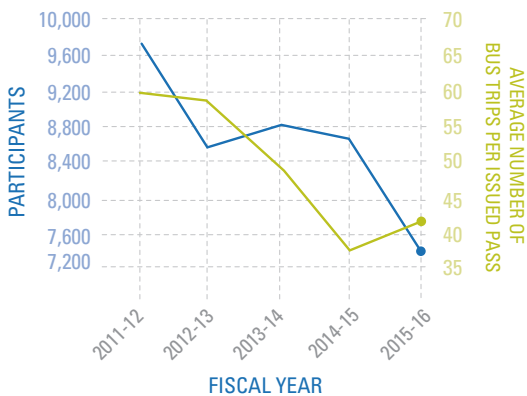


## FUEL TYPE USED IN FACILITIES OPERATIONS FLEET\*

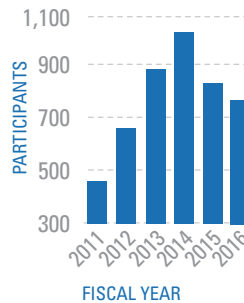


\*\* B20 Fuel was replaced with ultra low sulfur diesel in April 2015.

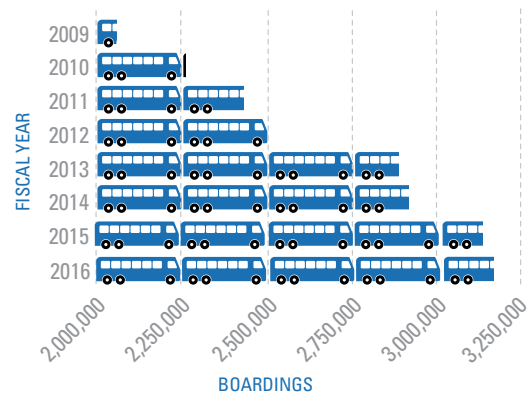
## STUDENTS, FACULTY AND STAFF USING GOPASS REGIONAL TRANSIT CARDS



## WOLFTRAILS ALTERNATIVE COMMUTING PARTICIPANTS



## WOLFLINE BUS SYSTEM PASSENGER BOARDINGS



## Wolfpack Celebrates 2016 Bike Month

The dozens of NC State employees who took to roads, trails and greenways as part of their cycling commute on May 20 gathered at the Bike to Work Day pit stop event. The event was sponsored by NC State WolfTrails in partnership with the Institute of Transportation Research and Education (ITRE), Centennial Campus Development and GoSmart. NC State cyclists also participated in the annual Capital City Bike Ride on May 6 as part of Bike Month.



## Technology Reduces Unnecessary Trips

The Office of Information Technology released a mobile app that allows university users to access NC State's cloud computing system, which provides 24/7 remote access to high-end lab computers and software.

# PROGRESS TOWARD STRATEGIC GOALS

**STRATEGY 1:** Develop a long-term campus vision addressing alternative transportation, parking, campus connectivity and congestion in coordination with the comprehensive Campus Master Plan.

**TACTIC:** Continue collaboration with strategic campus departments and the City of Raleigh in improving right of ways connectivity and safety for alternative transportation modes.

**PROGRESS:** Worked with Capital Project Management in implementing Schaub parking lot and associated pedestrian infrastructure (walkway and crosswalks) improvement project. This project realized some of the recommendations of the Sullivan Drive-Pedestrian Corridor Evaluation Study that was conducted in the Spring of 2015 by a private consultant. Also coordinated with the City of Raleigh in implementing the following bike roadway infrastructure that has led to a better connection between campuses: bike sharrows (on Varsity Drive between Western Boulevard and Crest Road, on Leadership Drive and Dan Allen Drive between Western Boulevard and Fraternity Court Drive) and bike lanes (on Varsity Drive between Avent Ferry Road and Partners Way including installation of appropriate bikeway signage).

**STRATEGY 2:** Reduce the consumption of petroleum products throughout the university fleet and procure more alternative fuel and low-emitting vehicles.

**TACTIC:** Evaluate alternative fuel options for the Wolfline contract renewal.

**PROGRESS:** As part of the Wolfline contract renewal, Transportation requested bids including use of alternative fuel, hybrids or electric buses. A new, fuel-efficient Wolfline bus fleet that runs on clean diesel is scheduled for delivery in August 2017.

**STRATEGY 3:** Increase Wolfline ridership and ensure that this campus bus system continues to provide a high level of service that meets user needs.

**TACTIC:** Implement route re-alignments, schedule changes and continue monitoring toward enhanced route productivity, service reliability and passenger comfort for low-performing routes.

**PROGRESS:** Executed route layout changes for routes 2, 6 and 11, and schedule changes for route 11 and 13 based on ridership, bus stop activities and on-time performance analysis. These changes started fall 2016 and performance monitoring is ongoing.

**STRATEGY 4:** Improve bicycle and pedestrian access on campus.

**TACTIC:** Continue to execute projects as per the sequencing plan for Campus Bicycle and Pedestrian Plan.

**PROGRESS:** Installed bike sharrows markings on Dan Allen Drive and Yarbrough Drive. Installed pedestrian crosswalk with appropriate signage at the Toxicology Department's upper parking deck. In collaboration with Capital Project Management, executed Rocky Branch trail color pavement marking at the Carmichael Gym parking area crossing for better pedestrian and bike safety.

**STRATEGY 5:** Research and develop more sustainable parking policies, including those that would increase carpools, shift parking to the campus periphery and prioritize parking of low-emitting vehicles.

*\*Indicates that tactic/progress is from 2014-2015 fiscal year but did not appear in that year's report*

**\*TACTIC:** Expand the Zipcar car sharing fleet on campus.

**\*PROGRESS:** New Zipcars have been added to Centennial Campus and Wolf Village for a total of 8 Zipcars on campus.

**TACTIC:** Add electric vehicle charging stations to accommodate increased use of plug-in vehicles.

**PROGRESS:** Two new stations were installed in Coliseum Parking Deck and Dan Allen Parking Deck.

**\*TACTIC:** Conduct the 2015 NC State Employee Commuting Survey.

**\*PROGRESS:** A commute travel behavior survey was conducted in spring 2015 to inform travel demand management strategies.

**STRATEGY 6:** Maximize the use of the alternative fuel offered at NC State's fueling facility.

**TACTIC:** Research the university's current vehicle fleet to determine which vehicles are capable of using alternative fuel and reprogram their fuel key accordingly.

**PROGRESS:** Recommendations are under review by university administration.

**TACTIC:** Reduce NC State's dependence on petroleum fuels by ensuring all light-duty vehicle acquisitions are in compliance with the U.S. Department of Energy's Energy Policy Act of 1992 (EPA Act), which requires 75 percent of all light-duty vehicle purchases to be alternative-fuel capable. These acquisitions must also be reported to the Department of Energy annually.

**PROGRESS:** Recommendations are under review by university administration.

**STRATEGY 7:** Reduce air pollution, greenhouse gas emissions and excess fuel consumption by vehicles.

**TACTIC:** Create a "Best Operating Practices" procedure for state-owned vehicle operations.

**PROGRESS:** Recommendations are under review by university administration.

**STRATEGY 8:** Analyze university-owned vehicles and processes for key efficiencies that can be implemented to achieve a more sustainable fleet size, content and operating practices.

**TACTIC:** Select third party consultant group that will guide universal fleet policies.

**PROGRESS:** The third party analysis has been completed. Recommendations are under review by university administration.





# COMMUNITY AND CULTURE

## CREATING A CULTURE OF SUSTAINABILITY ON CAMPUS

Sustainable universities thrive. When faculty, staff and students embrace sustainable actions, the entire university benefits. During this fiscal year numerous NC State events, partnerships, programs and student-led initiatives embedded sustainability in campus life while also having a positive impact in the community.



### Green Brick Awards Honor Sustainability Efforts

NC State's Campus Environmental Sustainability Team and Sustainability Council recognized outstanding campus sustainability contributions with 2016 Green Brick Awards to Annie Lopez (student recipient), Jessica Thomas (staff recipient), Bob Patterson (faculty recipient), the NC State Agroecology Education Farm (organization recipient) and the Waste Reduction Committee of the NC State Stewards student organization (impact and innovation recipient).



### NC State Becomes First 'Healthier Campus'

In November 2015, the university became the first in the United States to implement all 23 guidelines as part of its commitment to expand healthier options across campus.



### *Students Design Sustainability Solutions in Make-a-thon*

*KnowURShower, a water-saving shower device, earned the grand prize in NC State's first Make-a-thon, a 45-hour challenge to create solutions to campus sustainability challenges. The Feb. 19-21, 2016, event brought together 42 students on 11 teams to compete in one of three categories: energy, waste or water. With actual campus utility, waste and recycling data, student teams researched, designed and prototyped sustainability innovations.*

### **EARTH MONTH FEATURES 42 SUSTAINABILITY EVENTS**

NC State celebrated the planet in April 2016 with more than 40 events focusing on some aspect of sustainability, ranging from the annual Earth Fair celebration on the Brickyard to the annual Green Brick Awards.



### **15 CAMPUS WORKPLACES ACHIEVE SUSTAINABILITY CERTIFICATION**

The following campus workplaces earned Wolfpack Certified Sustainable Workplace recognition for sustainability efforts:

- Department of Fraternity and Sorority Life
- Outdoor Leadership Minor
- Grounds and Fleet Services
- English Department
- NC Clean Energy Technology Center
- Center for Integrated Pest Management
- Industrial Assessment Center
- Business Sustainability Collaborative
- Project Angelfish
- Case Dining Hall
- Fountain Dining Hall
- Clark Dining Hall
- USDA Forest Service
- Women's Center
- PowerAmerica





# 2015-2016 HIGHLIGHTS

## SUSTAINABILITY FUND AWARDS CAMPUS GRANTS

In May 2016, the student-led board of the NC State Sustainability Fund awarded \$161,000 of grant funding to 15 project proposals to improve campus sustainability. The grant funding is generated by a \$2 per semester student fee that students voted to create in 2012. This year's funded projects, which will be completed by summer 2017, support:

- Bringing the Nile Project, an art collective focused on water conflict and other issues, to NC State in March 2017 in partnership with NC State LIVE.
- Pilot project for "floating islands" in campus water basins that will aid in passive water treatment and stormwater management.
- Composting of cotton and fabric waste from the College of Textiles.
- Graduate student position to build sustainability programs within NC State Athletics
- Installation of a solar bus stop outside Witherspoon Student Center
- Pilot study using electronic laboratory notebooks (ELNs) in the Biotechnology program to reduce paper usage by 70 percent.
- Two pollinator-friendly landscaping projects on campus.
- Collaboration with the second annual NC State Make-a-Thon, a design and innovation challenge focused on addressing campus sustainability issues.
- Product development and testing of a student-created sensor that monitors campus dumpster capacity and alerts staff when emptying is needed.
- A new Alternative Service Break trip that involves student participants installing solar photovoltaic panels in underserved communities.
- Collection and redistribution of unwanted furniture to low-income students.
- Two performances by the Raleigh Civic Symphony and associated educational events focused on the celebration of nature and the National Parks Service.
- Installation of water bottle refilling stations in Jordan Hall and D.H. Hill Library.
- Purchase of food storage pans for the Food Recovery Network student group.



*Pollinator-friendly landscapes are one of the projects receiving a Sustainability Fund grant.*

## INITIATIVES PROMOTE CONNECTIONS BETWEEN SUSTAINABILITY, ENTREPRENEURSHIP

NC State's 2016 Lulu eGames startup competition added a new B Corps Champions sustainable business track that judged

student projects on the social and environmental impacts of their product. Additionally, sustainability was a theme of several other eGames winners. Social entrepreneurship was showcased during the campus Global Entrepreneurship Week emphasis in November 2015, and in February 2016 an NC State student team made the regional finals of the global Hult Prize competition for sustainability.



## TOUR EXPOSES STUDENTS TO INTERSECTION OF ENVIRONMENT, EQUITY

Partially funded by a University Diversity Mini-Grant through NC State's Office for Institutional Equity and Diversity, the College of Nat-

ural Resources and the University Sustainability Office coordinated a week-long May 2016 tour to raise student awareness about the environmental, societal and economic dimensions of sustainability.



## Students Serve During School Breaks

The 2015-2016 Alternative Service Break program involved NC State students on 23 service trips, including many related to sustainability issues such as economic development, water security and educational access. During these trips, students engage in direct service to a community, while being immersed in the culture.



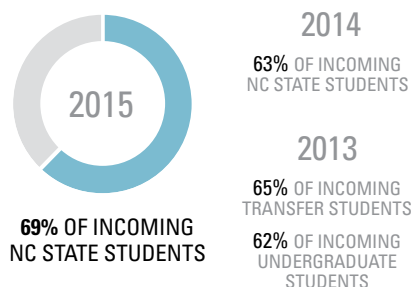
## Animals Highlighted Through Music, Art

To raise awareness of animals and nature, ARTS NC State hosted the Disappearing Frogs traveling art exhibition in March and an April performance of the Great Animal Orchestra, which was performed by the Raleigh Civic Symphony Orchestra of which NC State is part. The performance was funded by a grant from the NC State Sustainability Fund.

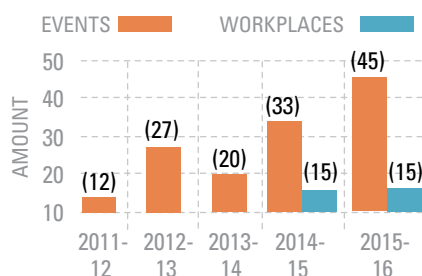




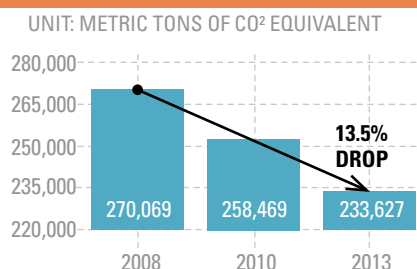
### SURVEY: PERCENT OF INCOMING STUDENTS FOR WHOM NC STATE'S SUSTAINABILITY COMMITMENTS INFLUENCED DECISION TO ATTEND



### WOLFPACK CERTIFIED SUSTAINABLE



### NC STATE GREENHOUSE GAS EMISSIONS



### NC STATE STEWARDS ADVANCE CAMPUS SUSTAINABILITY

Launched in 2013 as a student sustainability leadership program supported by the University Sustainability Office, 40 NC State Stewards accomplished:

- Installation of solar-powered charging stations at Tucker and Owen Residence Halls
- Leadership of three-year effort to remove plastic bags from campus dining and convenience store locations
- Participation in 25 outreach events
- Education about composting on campus and working in partnership to expand campus composting locations
- Receiving the NC State Green Brick (Innovation Impact Award), the City of Raleigh Environmental Award (Organization Award), NC State L.E.A.D. Award (Organization of Distinction Award and Outstanding Advisor Award), and second place in the National Association of College Auxiliary Services Student Author Contest



### FRATERNITIES, SORORITIES INTEGRATE SUSTAINABILITY

Several organizations achieved Wolfpack Certified Sustainable designation for major events.

Plus, four organizations hosted events that showcased sustainability and 13 organizations participated in the university's RecycleMania competition, with Kappa Delta earning top honors. The 2015 winners of the Most Sustainable Chapter Award are Alpha Kappa Alpha Sorority, Delta Zeta Sorority, Sigma Chi Fraternity, Lambda Theta Phi Latin Fraternity and Alpha Kappa Psi Business Fraternity.



### SUSTAINABILITY COUNCIL APPOINTED

Established in September 2015 by the Provost and the Vice Chancellor for Finance and Administration, the Sustainability Council replaces the Campus Environmental Sustainability Team as the organization charged with advancing sustainability campus-wide. In 2016, the Council began the process of developing the university's 2017-2022 Sustainability Strategic Plan.

### SUSTAINABILITY HIGHLIGHTED AS GLOBAL ISSUE

NC State's Office of International Affairs and the University Sustainability Office partnered for a three-part Global Issues Seminar series in fall 2015. Each seminar featured community leaders and faculty presenting about global aspects of water sustainability, urban sustainability and sustainable energy.



### Common Reading On Environmental Justice

Incoming students in fall 2015 read *Stand Up That Mountain*, a true story of environmental justice. A variety of supplemental events were held, including a trip for 20 students to the portion of the Appalachian Trail featured in the book.



### NC State, Habitat Partner to Build-A-Block

NC State's Habitat for Humanity campus chapter and Habitat Wake County formed in 2015 the largest partnership ever between a university and a Habitat affiliate. The partnership will construct 11 townhomes located off Lake Wheeler Road in fall 2016.



### EcoVillage Expands Residents' Understanding of Sustainability

In the EcoVillage's third year, residents participated in numerous sustainability community service activities, education seminars, socials and a spring break urban development field trip to Seattle.

# PROGRESS TOWARD STRATEGIC GOALS

## STRATEGY 1: Adopt, promote and adhere to a sustainability policy.

**TACTIC:** Provide education to key units on how to implement the university's sustainability standard operating procedures and policy (continuation from fiscal year 2015).

**PROGRESS:** With other priorities arising, this tactic did not see progress this year.

## STRATEGY 2: Report sustainability information on a national scale toward becoming a national leader in sustainability.

**TACTIC:** Submit the Association for the Advancement of Sustainability in Higher Education's Sustainability Tracking and Ranking System (STARS) report by winter 2015. Use the peer benchmarking information that results to inform the development of NC State's next five-year Sustainability Strategic Plan.

**PROGRESS:** NC State received the STARS Gold designation, putting the university in the top third of universities with a rating. A student used the STARS data to create benchmarking to peer institutions that helped guide NC State's sustainability strategic plan foundation.

## STRATEGY 3: Support opportunities to obtain funding for sustainability including grants, university campaigns, a student fee and seed money.

**TACTIC:** Continue to promote the NC State Sustainability Fund for initiatives that have student impact.

**PROGRESS:** In fiscal year 2015, the Sustainability Fund awarded 15 projects, totaling \$161,000.

**TACTIC:** Incorporate resource and funding needs into the 2017-2022 Sustainability Strategic Planning.

**PROGRESS:** Funding and resources are part of the draft Sustainability Strategic Plan priorities and goals. The Plan will be available for campus input in fall 2016 before finalized.

## STRATEGY 4: Implement a comprehensive sustainability education and awareness program that utilizes peer-to-peer networks.

**TACTIC:** Implement Change Your State programming into NC State's diversity and inclusion organizations.

**PROGRESS:** University Sustainability Office staff and NC State Stewards partnered with new organizations for sustainability programming including Alpha Phi Alpha Fraternity Inc. and the Black Student Board. The College of Natural Resources and the University Sustainability Office received a diversity mini-grant from NC State's Office for Institutional Equity and Diversity for an environmental justice tour of eastern North Carolina. Programs with the Women's Center are planned for fall 2016.

**TACTIC:** Document and communicate the successes of the NC State Stewards student sustainability leadership program, including using a program assessment model with measurable outcomes. Focus on increasing the Stewards' peer-to-peer outreach while maintaining projects. Work with the Alumni Association to create a sustainability alumni network.

**PROGRESS:** The NC State Stewards participated in more than 20 outreach events during the 2015-2016 academic year. While maintaining its existing work and priorities, the Stewards created a new outreach group focused on peer-to-peer education through programming and events. The Stewards were recognized for their success receiving the Student Organization Award of Distinction at the NC State L.E.A.D. Awards, City of Raleigh Environmental Award in the organization category and the NC

State Green Brick award in the innovation/impact category. A program assessment plan was created for the NC State Stewards program, including a pre- and post-program survey. The alumni network will be developed in future years.

**TACTIC:** Support interest in creating a staff sustainability community.

**PROGRESS:** Due to leadership changes and other priorities this initiative did not progress.

## STRATEGY 5: Create a network among the local sustainability community that includes universities, governments, corporations and nonprofits.

**TACTIC:** Determine a means for community involvement in development of NC State's 2017-2022 Sustainability Strategic Plan.

**PROGRESS:** Community involvement continues to be a strong value of the Sustainability Council that is developing the plan. The Sustainability Council hosted in-person and online sessions to gain community input on the Sustainability Strategic Plan. The Council launched five working groups in which any member of the community could participate. To date, more than 170 people representing all colleges and major departments drafted nearly 35 strategies that are in review for the next Sustainability Strategic Plan.

## STRATEGY 6: Grow the Campus Environmental Sustainability Team (CEST) as a cross-campus team of faculty, staff, students and community members engaged in campus sustainability.

**TACTIC:** Ensure that the members of the Campus Environmental Sustainability Team (CEST) transition into the new Sustainability Council.

**PROGRESS:** The University Sustainability Office provided regular communication and clear guidance on the transition and how the CEST participants will continue to take part in the Sustainability Council.

## STRATEGY 7: Establish annual campus events to embed sustainability as a part of campus culture.

**TACTIC:** Continue focus on urging high-profile traditions and events to pursue the Wolfpack Sustainable Event Certification.

**PROGRESS:** In fiscal year 2016, 45 events and 15 workplaces were certified under the Wolfpack Sustainable programs, which is a 36 percent and a 100 percent increase respectively. Several event traditions continued to use the certification.

## STRATEGY 8: Create incentives and provide recognition and rewards to promote sustainability across campus.

**TACTIC:** Continue the Green Brick Award ceremony as a stand-alone event and consider expanding its reach.

**PROGRESS:** The Green Brick Awards continued as a stand-alone event. A new innovation/impact award category was added.

**TACTIC:** Host a celebration to celebrate accomplishments of the Campus Environmental Sustainability Team (CEST) at the conclusion of the 2011-2016 Sustainability Strategic Plan.

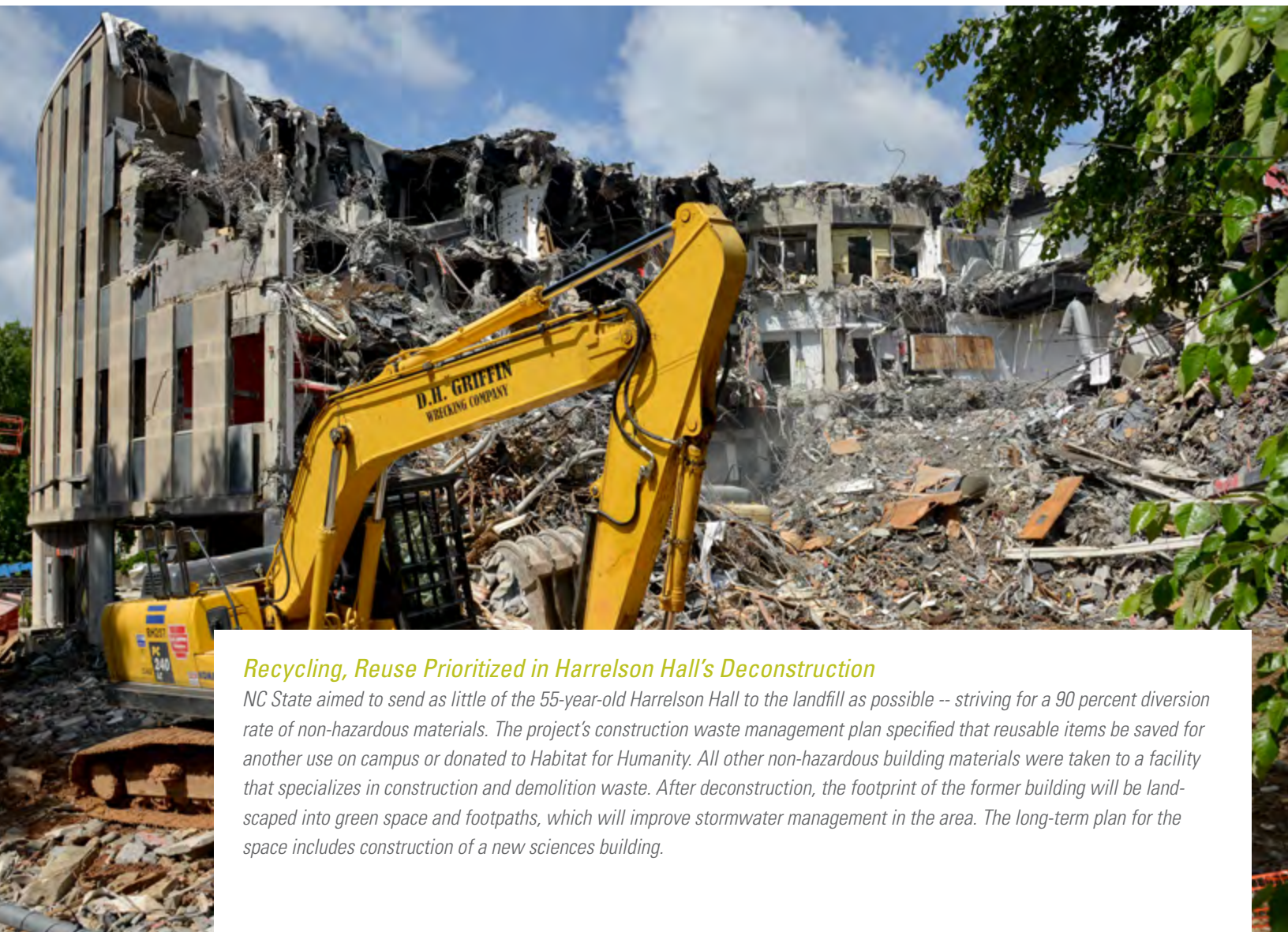
**PROGRESS:** A public CEST celebration was coupled with the Green Brick Awards. Additionally, CEST members had a lunch event and service project at the NC State Agroecology Education Farm to commemorate five years of accomplishments.



# GREEN DEVELOPMENT

## BUILDING AN EFFICIENT, SUSTAINABLE CAMPUS

NC State's campus serves as a living laboratory for students, providing hands-on learning opportunities in smart resource management and environmental sustainability. By applying innovations that increase human health and well-being while reducing the environmental footprint of campus, NC State models environmental, social and economic sustainability in the local and global community.



### *Recycling, Reuse Prioritized in Harrelson Hall's Deconstruction*

NC State aimed to send as little of the 55-year-old Harrelson Hall to the landfill as possible -- striving for a 90 percent diversion rate of non-hazardous materials. The project's construction waste management plan specified that reusable items be saved for another use on campus or donated to Habitat for Humanity. All other non-hazardous building materials were taken to a facility that specializes in construction and demolition waste. After deconstruction, the footprint of the former building will be landscaped into green space and footpaths, which will improve stormwater management in the area. The long-term plan for the space includes construction of a new sciences building.



# 2015-2016 HIGHLIGHTS



## NEW GARDENS ATTRACT POLLINATORS

In April 2015, professor Dennis Werner, horticulture students and Grounds Management employees installed more than 600 pollinator-friendly plants along Partners Way near Main Campus Drive. The space will ultimately become an 8,000-square-foot natural area where weeds and indigenous pollinator plants are allowed to grow, creating a natural habitat that requires minimal maintenance. On central campus, a student-led effort resulted in a formal pollinator garden in the Honors Village. Additional pollinator projects received grants from the NC State Sustainability Fund for implementation in fiscal year 2017.



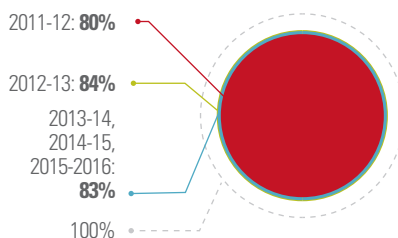
## BUILDINGS EARN LEED SILVER

Two buildings -- the 283,000-square-foot Talley Student Union and the nearly 30,000-square-foot Carol Johnson Poole Clubhouse located at the university's Lonnie Poole Golf Course -- earned certification at the silver level for Leadership for Energy and Environmental Design (LEED).

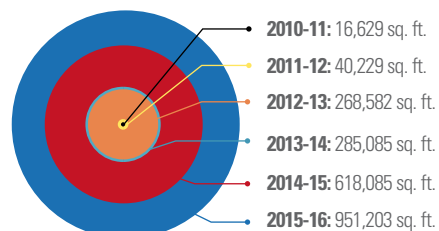
## LEED (Leadership in Energy and Environmental Design) CERTIFIED AND REGISTERED BUILDINGS



## PERCENTAGE OF CAMPUS BUILDINGS WITHIN A 600-FOOT WALK OF A COURTYARD, PLAZA OR NEIGHBORHOOD STREET



## LEED CERTIFIED SPACE ON CAMPUS



## SUSTAINABLE CONSTRUCTION, RENOVATION STANDARDS FINALIZED

More often than the university constructs new buildings, it renovates existing buildings. Sustainability standards were finalized for all campus construction and renovation projects, with the project's size directing the required actions in the areas of integrated design, indoor air quality, materials, recycling and reuse, efficiency and close out.



## Students Expand Artist's Backyard

A landscape architecture Design+Build studio class finished additions to the Artist's Backyard and Owen's Refuge sustainable landscapes in April 2016. Located in between Owen and Turlington Residence Halls, the project provides real-world experience for students while increasing sustainable landscapes on campus.



## Bioblitz Explores Campus Wildlife

There are no wolves, but campus does have grey foxes, coyotes and beavers. With a grant from the NC State Sustainability Fund, student and faculty biodiversity researchers used motion-sensor cameras to take pictures of animals in areas on and around campus.



## Students Study Building's LEED Potential

Nearly two dozen students participated in a special topics course that evaluated Bragaw Residence Hall's potential to achieve Leadership for Energy and Environmental Design (LEED) certification for existing buildings. The course provided real-world experience required for students to pursue certification as a LEED professional.



## 2015-2016 TACTICS

# PROGRESS TOWARD STRATEGIC GOALS

**STRATEGY 1:** Update the campus Physical Master Plan to integrate and coordinate transportation, land use, utilities, buildings and stormwater planning.

**TACTIC:** Update the Centennial Campus Precinct Development and Design Guidelines.

**PROGRESS:** The effort to update this document will be deferred until the reorganization of University Real Estate and Development is completed.

**STRATEGY 2:** Adopt a sustainability vision statement and include it as part of the scope statement for all projects more than \$500,000.

**TACTIC:** Integrate Tiered Sustainability Project Requirements into Capital Project Management processes. Display standards on *sustainability.ncsu.edu*.

**PROGRESS:** The sustainability standards are posted online. To help project managers develop a sustainability scope of work for complex projects, the Procedure Scope Statement was developed. For complex informal projects, a "project description summary" template was developed to streamline the process for smaller projects. This project description summary will be implemented by December 1, 2016.

**STRATEGY 3:** Integrate sustainable strategies for all new construction and renovation projects including publicly owned, privately owned, and leased or partnership properties.

**TACTIC:** Highlight on the Facilities website the unique or especially effective sustainable tactics that were implemented on recent projects.

**PROGRESS:** Defer to 2017. Capital Project Management will lead this effort.

**TACTIC:** Continue working with University Real Estate and Development to integrate sustainability goals into Centennial Campus ground lease templates.

**PROGRESS:** This tactic is ongoing. While all new buildings with more than 20,000 gross square feet are subject to the Chancellor's commitment to achieve Leadership in Energy and Environmental Design (LEED) certification, this has been approached as part of negotiations with developer-proposed buildings. More consistency is needed.

**STRATEGY 4:** Exceed NC State's established minimum commitment to achieve LEED Silver certification.

**TACTIC:** Lay groundwork to recommend new LEED commitment, such as Gold or Platinum, for the next five-year Sustainability Strategic Plan.

**PROGRESS:** LEED version 4 is the standard for all new projects on campus, a standard which exceeds the previous standard of LEED version 3.

**TACTIC:** In an effort to provide a shower facility in buildings heavily populated by staff, install shower in Administrative Services III in Spring 2016 to accommodate/encourage biking commuters.

**PROGRESS:** This small renovation was designed, but budget cuts prevented this project from moving forward. Possibly defer to 2017.

**STRATEGY 5:** Give priority to holistic building and property modifications that maximize efficient and effective resource use.

**TACTIC:** Seek funding to more holistically complete final phase of Ricks Hall renovation.

**PROGRESS:** Funding for final phase of Ricks Hall was not secured. An energy-condition matrix is being developed as a tool to determine renovation priorities.

**TACTIC:** Work with Land Use group to identify a project to pilot low-impact development for stormwater capture system.

**PROGRESS:** Defer to 2017.

**TACTIC:** Train staff on LEED version 4.

**PROGRESS:** An in-house training using U.S. Green Building Council Education resources will be held in October 2016 for designers and project managers.

**STRATEGY 6:** Design new buildings and utilize existing facilities as long-term, flexible resources.

**TACTIC:** Work with Transportation to develop building-related alternative transportation facility standards. Examples could include commuter showers, bike parking in parking decks (covered parking), lockers in Talley Student Union or Carmichael Gym for motorcyclists, etc.

**PROGRESS:** Defer to 2017. Capital Project Management and Office of the University Architect will lead development of a draft of the Design and Construction Guidelines.

**STRATEGY 7:** Enhance utilization and management of campus and building space to increase efficiency and reduce the need for new construction.

**TACTIC:** Continue project that tags university personnel to office and/or research space in order to identify under-utilized space.

**PROGRESS:** Ongoing effort to optimize campus space and minimize need for university to build or acquire additional space.

**TACTIC:** Complete a classroom utilization study.

**PROGRESS:** Phase I of the classroom utilization study is complete. Beginning Phase 2 is dependent on funding that has been requested.

**TACTIC:** Continue implementation of the Strategic Space Reserve initiative to determine locations of under-utilized or vacant academic space for repurposing with more efficiency to accommodate Chancellor's Faculty Excellence Program Fall 2016 cohort hires.

**PROGRESS:** Fall 2016 cohort hires were accommodated through 56,762 square feet of repurposed space.

**STRATEGY 8:** Create pedestrian-friendly, mixed-use neighborhoods to reduce the distance between necessary services and to avoid single occupant vehicle use.

**TACTIC:** Ensure Pullen Road extension is safe and inviting for pedestrians and bicyclists.

**PROGRESS:** The design of the street is in process and includes sidewalks, bike lanes, a multipurpose path and large shade trees to improve pedestrian comfort.

**TACTIC:** Start update of the Landscape Implementation Plan.

**PROGRESS:** The plan update has begun and is anticipated to be com-

**TACTIC:** Complete exterior lighting study for North and Central campus precincts with a list of prioritized projects.

**PROGRESS:** Complete. An energy performance management contract to implement replacement of all exterior lighting on campus is underway, using the new standards identified in this study.

**STRATEGY 9: Improve the acreage of campus open spaces.**

**TACTIC:** Ensure the Case Commons project designs a portion of the Cates Avenue Master Plan so that a campus street is created.

**PROGRESS:** The project will implement a portion of the Cates Avenue Master Plan from the corner of Jeter Drive to the west side Case Academic Center.

**TACTIC:** Guide Engineering Building Oval project design to further develop and enhance the middle terrace of The Oval.

**PROGRESS:** The project scope statement, approved by the Building Committee, includes redevelopment of a portion of the middle terrace.

**STRATEGY 10: Increase the percentage of undergraduate students living on campus to reduce transportation needs and to enhance retention.**

**TACTIC:** Add 62 beds of on-campus housing at Case Commons Residence Hall.

**PROGRESS:** 62 student beds have been accommodated in the project design.

**STRATEGY 11: Create and administer a Stormwater Master Plan for campus in conjunction with the NC State Stormwater Programs and the comprehensive Campus Master Plan.**

**TACTIC:** Create a Stormwater Working Group.

**PROGRESS:** On hold. Enhancing and coordinating stormwater efforts to ensure water quality for the growing campus is a strategy of the university's next Sustainability Strategic Plan.

**STRATEGY 12: Improve and enhance campus natural areas and habitats.**

**TACTIC:** Ensure the Lake Raleigh bridge project enhances the wooded areas and the lake habitats.

**PROGRESS:** The schematic design reflected improvements to these areas. The project is on hold.

**STRATEGY 13: Strengthen the campus Tree Reforestation Plan.**

**TACTIC:** Begin street tree master plan for Lampe Drive.

**PROGRESS:** The study has begun and is on track to be completed during fiscal year 2017.

**STRATEGY 14: Develop a land management plan for Lake Raleigh Woods.**

**TACTIC:** Draft Lake Raleigh Woods Management Plan and seek review by the Provost and Vice Chancellor for Finance and Administration.

**PROGRESS:** Draft plan is complete and amid final edits before being submitted to campus administration.

**STRATEGY 15: Employ best practices for sustainable operation of campus buildings and grounds such as integrated pest management, biodiversity, green cleaning, composting, recycling and water reuse.**

**TACTIC:** Offer a LEED Lab course for students with campus partners.

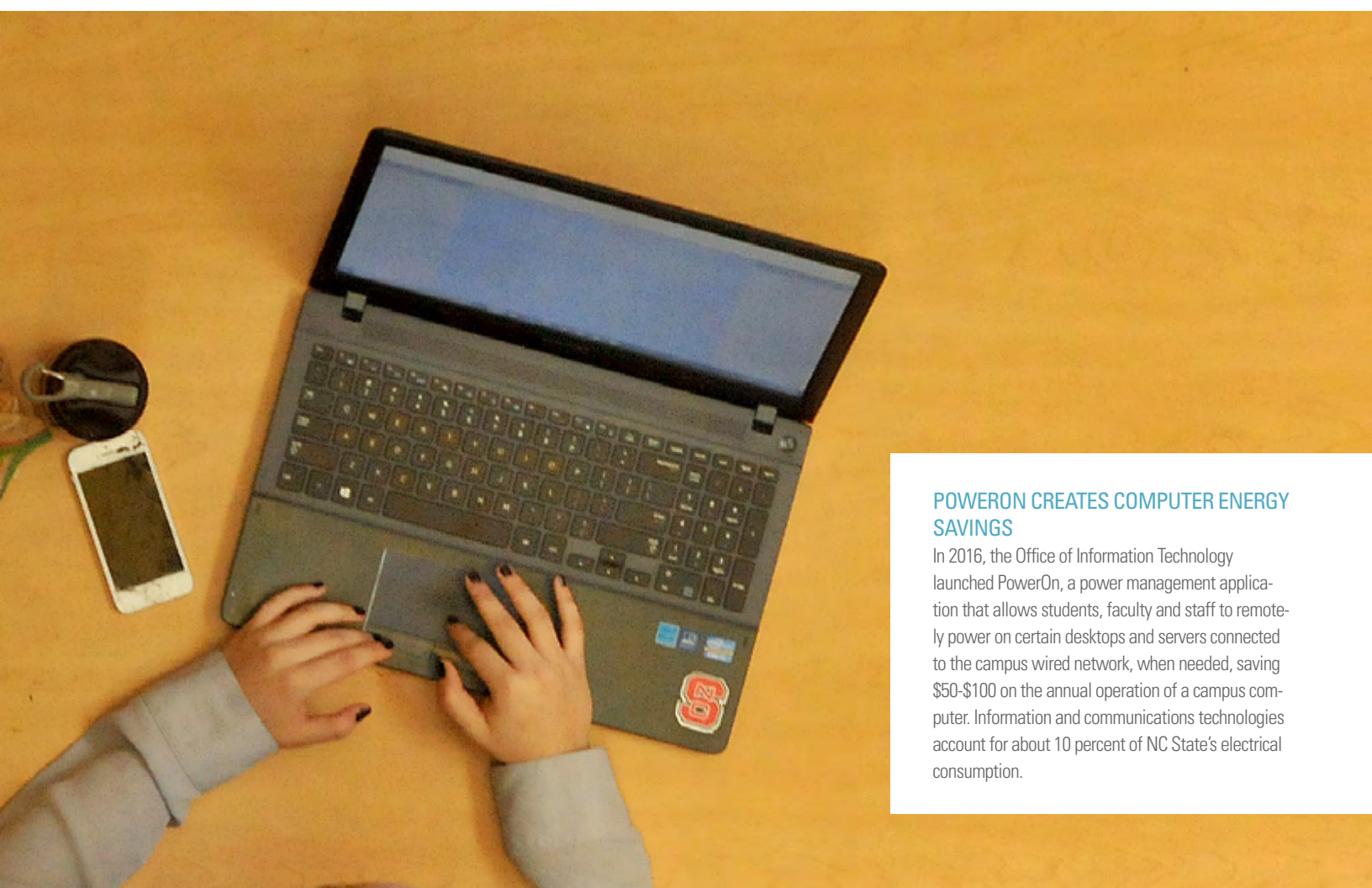
**PROGRESS:** LEED Lab course for students featured a partnership with Campus Life to study Bragaw Hall. Many other groups participated including Grounds Management, Waste Reduction and Recycling, University Housekeeping, Building Maintenance and Operations and Transportation Office. The fall 2016 LEED Lab course focuses on Talley Student Union. Campus Enterprises is committed to certification under LEED O+M (Operations and Maintenance) for Talley Student Union. This will encourage further development of best practices within Facilities.



# ENERGY AND WATER

## ACCELERATING CAMPUS UTILITY EFFICIENCY AND COST-SAVINGS

Energy and water are among a university's most necessary and costly expenses. NC State's aggressive energy management strategies are designed to minimize costs, save natural resources and reduce greenhouse gas emissions. These conservation strategies are successfully reducing campus energy and water use while enabling the university to progress toward surpassing state-mandated utility reduction goals.

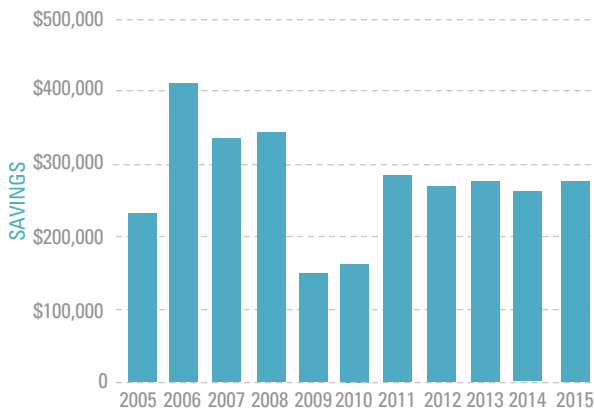


### POWERON CREATES COMPUTER ENERGY SAVINGS

In 2016, the Office of Information Technology launched PowerOn, a power management application that allows students, faculty and staff to remotely power on certain desktops and servers connected to the campus wired network, when needed, saving \$50-\$100 on the annual operation of a campus computer. Information and communications technologies account for about 10 percent of NC State's electrical consumption.

# 2015-2016 HIGHLIGHTS

## CAMPUS WINTER BREAK ENERGY SAVINGS



### WINTER BREAK SAVINGS PASS \$3 MILLION

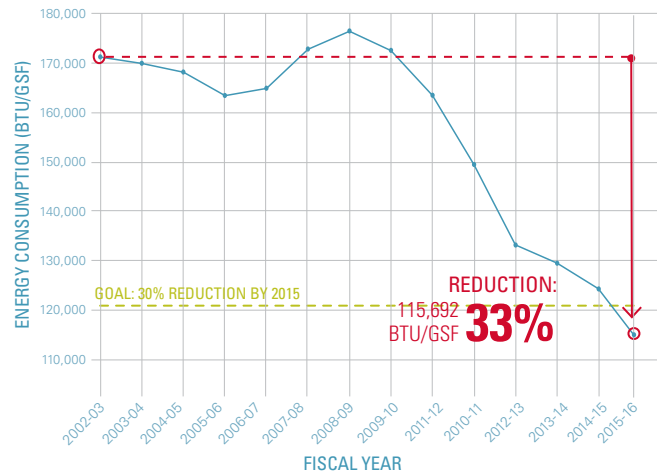
NC State saved \$288,990 in avoided energy costs during winter break 2015. Since the Winter Holiday Energy Saving Initiative began in 2004, the program has saved more than \$3 million.



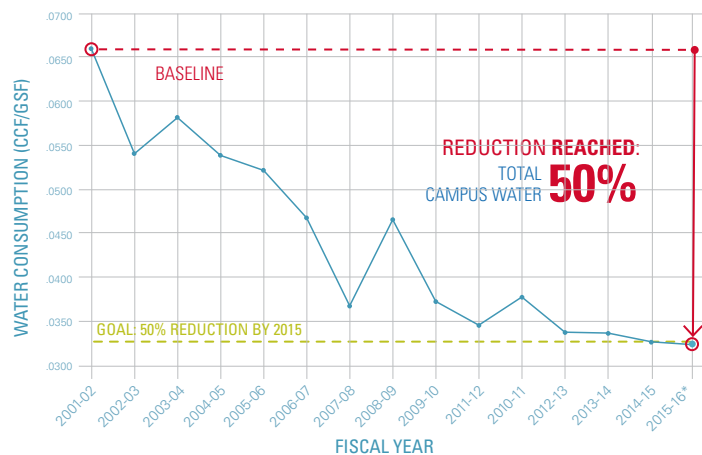
### RECOMMISSIONING TEAM SPURS SAVINGS

The campus recommissioning team performed comprehensive HVAC audits and repairs on 13 buildings, generating \$1.95 million in energy cost avoidance since 2014.

## CAMPUS ENERGY CONSUMPTION PER GROSS SQUARE FOOT



## CAMPUS WATER CONSUMPTION PER GROSS SQUARE FOOT



### Energy Conversation Measures Completed

Energy Management successfully funded more than \$650,000 of energy conservation measures on campus, in part through cost sharing programs with campus partners. Efficiency measures included lighting upgrades, improvements to steam systems and building control upgrades.



### Energy-Saving Cogeneration Coming to Centennial Campus

The university's fourth energy performance contract progressed through the programming phase to determine feasibility of combined heat and power (CHP) technology on Centennial Campus. Construction is set to begin in spring 2017.





### SUMMER SCHEDULES SAVE ENERGY

Through Maymester, Summer I and Summer II sessions, cooling was reduced in buildings when classrooms were not in use in order to save energy. The effort resulted in \$87,000 in energy cost avoidance.



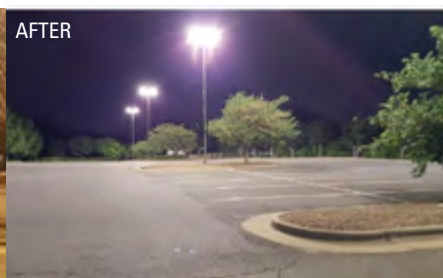
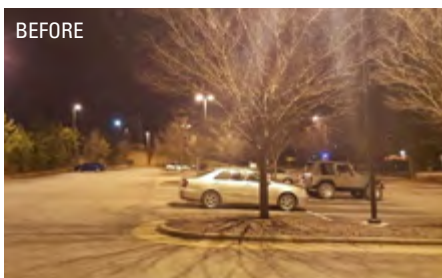
### FILTERS IMPROVE EFFICIENCY

A new HEPA filter was installed in one of two combustion turbine generators at the Cates Utility Plant. The filter reduces degradation in performance, resulting in increased electrical output that paid for the cost of the \$16,384 filter in less than two months.



### STUDENTS POWER EFFORT TO ADD SOLAR ENERGY CHARGING STATIONS

NC State's Sustainability Fund and senior class of Park Scholars funded the October 2015 installation of a solar sculpture on Centennial Campus. That same month three solar-powered charging stations mounted on outdoor umbrellas were installed outside of Tucker and Owen Residence Halls.



### Outdoor Lighting Upgraded

A pilot project on Centennial Biomedical Campus replaced outdoor lighting with LED technology that has reduced outdoor lighting energy use between 60 to 70 percent.



### Centennial Campus Gets Water Reuse Line

NC State installed a reuse water pipeline, which will more cost-effectively supply water for utility cooling towers, toilet flushing at Hunt Library and irrigation on the university's Centennial Campus.



# PROGRESS TOWARD STRATEGIC GOALS

**STRATEGY 1:** Achieve a 30 percent reduction in building energy consumption by 2015 against the fiscal year 2003 baseline.

**TACTIC:** Continue developing more accurate semester building schedules to operate building mechanical systems in alignment with actual building use. Install zone override buttons to accommodate building occupants. Cultivate a working relationship with the Registrar's Office to develop energy conscientious classroom schedules.

**PROGRESS:** Through strategic classroom and HVAC scheduling, more than \$87,000 in energy costs was avoided over summer 2015.

**TACTIC:** Implement the fourth energy performance contract as funding is available.

**PROGRESS:** A self-perform energy performance contract is in the Investment Grade Energy Audit phase to fund a cogeneration facility at the Centennial Central Plant. Cogeneration has a successful track record at the university, resulting in energy savings at the Cates Steam Plant.

**TACTIC:** Implement the next phase of the D.H. Hill Library and Weaver Labs building automation system (BAS) upgrades.

**PROGRESS:** Phase I and Phase III of the DH Hill and Weaver lab BAS upgrades, respectively, were completed. Once all phases are complete, the energy consumption in both buildings is estimated to decrease by 10 percent.

**TACTIC:** Continue Building Maintenance and Operations' recommissioning activities at selected energy intensive campus buildings as funding is available.

**PROGRESS:** The recommissioning team continued to make great progress. The program has created \$1.95 million in energy cost avoidance in 13 buildings since 2014 (\$1.2 million in this fiscal year).

**TACTIC:** Implement a campus site lighting LED pilot on Centennial Biomedical Campus to achieve buy-in and approval for an energy saving performance contract that will lower outdoor lighting energy use up to 70 percent.

**PROGRESS:** Complete. LED conversions in the outdoor lighting at Centennial Biomedical Campus cut the lighting consumption and cost in half.

**TACTIC:** Install LED lighting fixtures at Centennial Biomedical Campus facility maintenance shop area.

**PROGRESS:** No activity due to other higher priority projects.

**TACTIC:** Replace hot water storage tanks with instantaneous water heating at Biltmore Hall and the Biological Research Facility.

**PROGRESS:** The old storage water heaters were replaced with smaller, semi-instantaneous water heaters, creating less steam consumption and waste that results in \$10,000 of annual avoided costs between the two tanks.

**TACTIC:** Survey and replace defective campus steam traps in order to increase the efficiency of campus steam infrastructure.

**PROGRESS:** Complete.

**TACTIC:** Install steam trap and steam piping insulation in utility distribution areas and buildings.

**PROGRESS:** Complete. Utility savings are estimated to be \$18,800 annually.

**STRATEGY 2:** Achieve a 50 percent reduction in building water consumption by 2015 against the 2002 baseline.

**TACTIC:** Install autoclave water miser devices as funding and opportunities are available.

**PROGRESS:** No activity due to other higher priority projects.

**TACTIC:** Conduct a professional water audit of selected restrooms and showers to quantify building water conservation opportunities.

**PROGRESS:** A random sample of lavatory fixtures were surveyed in 15 campus buildings. Opportunities for improvement were identified such as the installation of missing sink aerators and low-flow fixtures. Future initiatives will implement these recommendations.

**TACTIC:** Upon completion of the reuse water pipeline on Centennial Campus, quantify potable water consumption and cost avoidance.

**PROGRESS:** Because the City of Raleigh reuse line serving Centennial Campus was completed in late fiscal year 2016, annual savings will be calculated in fiscal year 2017.

**TACTIC:** Implement a smart irrigation central control system pilot.

**PROGRESS:** Five stand-alone irrigation systems were converted to a centralized computer-based control system. The upgrade allows for more efficient real-time and weather-based control of the system to reduce water cost and use. The system is expected to have a payback of less than one year.

**STRATEGY 3:** Improve energy data management capabilities and make data-driven decisions utilizing enhanced energy data.

**TACTIC:** Complete the third year of measurement and verification reporting for three energy performance contracts: 13-building, cogeneration and Phytotron.

**PROGRESS:** Reporting was completed for the 13-building and cogeneration contracts. The Phytotron energy model is being revised and reporting will be based upon the updates.

**TACTIC:** Quantify key performance metrics (inputs and outputs) for campus district energy plants both individually and aggregated. Determine optimal strategies for alternative fuel sources and operations when utility plants are curtailed from using natural gas.

**PROGRESS:** Developed a curtailment operations guide to determine the most cost-effective dispatch strategy based upon current oil prices when natural gas is curtailed.

**TACTIC:** Complete mandatory measurement and verification reporting for buildings that have energy conservation measures funded by Senate Bill 668.

**PROGRESS:** Energy and water usage and cost were reported for all required (9) buildings within the 2015-16 fiscal year.

**TACTIC:** Build upon lessons learned from building analytics software pilot to implement a new pilot project with different software.

**PROGRESS:** A continuous commissioning software was piloted at Fox Labs, Jordan Addition and Phytotron. This software was linked with data from the building automation systems to determine when the building was not functioning as designed. The software also identified energy saving opportunities that were implemented.



**STRATEGY 4:** Train and educate staff and building end-users to properly operate and maintain building systems in an energy efficient manner.

**TACTIC:** Continue to roll out energy dashboards to more campus buildings and promote through an awareness campaign.

**PROGRESS:** No activity due to other higher priority projects.

**TACTIC:** Publish the 13th volume of the NC State Strategic Energy and Water Report for fiscal year 2014.

**PROGRESS:** Complete. Online: [go.ncsu.edu/EnergyWaterReport](http://go.ncsu.edu/EnergyWaterReport)

**TACTIC:** Continue to utilize students to identify campus energy and water conservation opportunities.

**PROGRESS:** No activity due to other higher priority projects.

**TACTIC:** Publish energy and water efficiency case studies that highlight successes and lessons learned related to energy and water management on campus. Venues to include NC State communication outlets, U.S. Department of Energy's Better Building Challenge, U.S. Environmental Protection Agency, Energy Star, APPA: Leadership in Educational Facilities, Association for the Advancement of Sustainability in Higher Education and Energy 2030.

**PROGRESS:** Case studies highlighting NC State's energy efficiency achievements were posted on both the Better Building Challenge and Energy 2030 websites. Campus energy conservation progress has also been featured in the newsletter of the Association for the Advancement of Sustainability in Higher Education.

**STRATEGY 5:** Ensure a cost-effective and reliable energy supply by developing business scenarios and strategies for diversifying fuel sources.

**TACTIC:** To stabilize the cost of the university's natural gas purchases, issue a request for proposal to qualified transport marketers to purchase natural gas for the period 2017 through 2020.

**PROGRESS:** 1,013,000 dekatherms of natural gas were purchased for delivery during the period December 2015 to November 2018. A new base contract was awarded to BP for delivery of natural gas for the period of December 2016 to November 2018.

**TACTIC:** Complete an electric rate review with Duke Energy Progress of all 200+ electric utility accounts to right-size use to rate. Identify additional accounts that can be opted out of the utility's Demand Side Management/Energy Efficiency Program.

**PROGRESS:** Met with Duke Energy Progress to discuss a rate review and requested rate changes in areas where costs could be reduced on a different rate schedule.

**STRATEGY 6:** Evaluate utility financial structures that create incentives for saving energy.

**TACTIC:** Refresh the ultra-low temperature freezer rebate program by targeting one or two new energy efficient units as funding is available.

**PROGRESS:** Canceled due to other higher priority projects.

**STRATEGY 7:** Implement green standards and practices for information technology and computing.

**TACTIC:** Continue dialog with the Office of Information Technology's Green IT Committee to identify and implement energy conservation best practices.

**PROGRESS:** The Office of Informational Technology officially launched PowerOn, a power management application that allows students, faculty and staff to remotely power on their computers, when needed, saving \$50-\$100 on the annual operation of a campus computer.

# EVENTS, AWARDS AND HONORS



## STARS GOLD

NC State's sustainability efforts have earned the university its first Gold rating from the Association for the Advancement of Sustainability in Higher Education (AASHE). AASHE's Sustainability Tracking, Assessment and Rating System (STARS) is the most widely recognized international framework that more than 750 colleges and universities use to self report and measure their sustainability performance.



## PRINCETON REVIEW GREEN COLLEGE

With a score of 97 in sustainability, The Princeton Review named NC State to its annual Guide to Green Colleges, which identifies the nation's most environmentally-friendly universities.



## GREEN CLEANING AWARD FOR SCHOOLS AND UNIVERSITIES

University Housekeeping was recognized nationally as a Silver winner in the Green Cleaning Award for Schools and Universities competition sponsored by *American School & University Magazine*, Green Cleaning Network and Healthy Schools.



## CITY OF RALEIGH ENVIRONMENTAL AWARDS

The NC State community received the following honors at the 2016 City of Raleigh Environmental Awards:

- Outstanding Organization Award for NC State Stewards
- Education Award for NC State Agroecology Education Farm
- Individual Award for Erin White, who graduated from and taught at NC State
- Agriculture Award for Advocates for Health in Action to add edible landscaping along a stretch of greenway through campus
- Top prizes in the Trashion Fashion Design Competition for College of Textiles students Jessica Crabtree, Amber Beasley, Jillian Brownell and Ting-Yu Yeh.



## NATIONAL ASSOCIATION OF COLLEGE AUXILIARY SERVICES

A student-authored essay by the NC State Stewards earned second place in the National Association of College Auxiliary Services' (NACAS) annual student author contest.



## BEST WORKPLACE FOR COMMUTERS

NC State ranked among the country's top 29 employers for exemplary efforts to offer sustainable transportation options such as vanpool, transit and telework. NC State was among 10 universities to receive the honor.



## NET IMPACT

Both the undergraduate and graduate NC State Net Impact chapters in the Poole College of Management have been honored with Gold Chapter status for excellence in programming and commitment to the organization's ideals of positive environmental and social impact.

## INVEST FOR IMPACT COMPETITION

NC State Jenkins MBA students earned second place in 2016 Invest for Impact hosted by the University of North Carolina at Chapel Hill.

## BEST COLLEGE DINING EXPERIENCES

At number 31, NC State made the 50 Best List of Top College Dining Experiences in part because of its focus on sustainability and nutrition.

## L.E.A.D. AWARDS

At the university's annual awards for leadership and service, the NC State Stewards earned the Student Organization Award of Distinction. The Stewards' advisor, Rebekah Dunstan, was also honored with the Outstanding Advisor Award.

## SIERRA CLUB COOL SCHOOLS

NC State ranked 87th in the Sierra Club's 2016 Cool Schools sustainability rankings.



# SUSTAINABILITY-RELATED CAMPUS EVENTS DURING FISCAL YEAR 2015-2016:

33

The list includes sustainability events and events that achieved recognition through Wolfpack Certified Sustainable, a self-reporting tool to raise awareness of sustainability in event planning. Level of certification is indicated by color: **Contributor**, **Steward** and **Champion**



## 2015

Environmental Life Cycle Assessment Workshop, Aug. 3 – 7  
Campus Farmer's Market, Aug. 5, 12, 19  
**Welcome Lunch**, Aug. 13  
4 the World Hunger Banquet, Aug. 16  
**RecFest**, Aug. 16  
Campus Connections, Aug. 18  
**Environmental Sciences Connections Social**, Aug. 18  
Back to School Jam, Aug. 19  
**Packapalooza**, Aug. 22  
Climate-Smart Agriculture: Innovation and Resiliency, Aug. 27  
NC State Global Change Symposium, Aug. 28  
**Stand Up That Mountain Panel Discussion**, Aug. 28  
Moving Beyond the GMO Controversy, Aug. 31  
All Carolinas Meal, Sept. 2  
Exploring the Role of Temperature in the Ocean Through Metabolic Scaling, Sept. 3  
Equitable & Sustainable Tourism Research Circle, Sept. 5  
Seminar: Can Forests Take the Heat?, Sept. 9  
Read Smart: The Bees, Sept. 10  
**Chi Omega Pancake Dinner**, Sept. 12  
**Global Issues Seminar: Cities Where We Live**, Sept. 15  
Sustainability at Talley's Grand Opening, Sept. 16  
Observational and Experimental Studies to Examine Plant and

Insect Responses to Climate Change, Sept. 17  
**Talley Student Union Tour**, Sept. 18  
**Business Sustainability Collaborative Launch**, Sept. 21  
Energy The Works! Solar Energy, Sept. 21  
Net Impact Social, Sept. 22  
Sustainability at NC State Men's Soccer Game, Sept. 22  
Indigenous Peoples and Climate Change, Sept. 23  
Underestimated: Our Not So Peaceful Nuclear Future, Sept. 25  
**Sustainability in Teaching Academy**, Oct. 8  
Translational Research Symposium, Oct. 10  
**Alternative Vehicle Showcase**, Oct. 14  
Improving Biodiversity in a Warming World, Oct. 15  
**Global Issues Seminar: The Water We Drink**, Oct. 19  
**Sciences, Sustainability & Environment Career Fair**, Oct. 20  
Research in Sustainability Seminar: Eric Leeper, Oct. 20  
Inducements in Nuclear Proliferation, Oct. 21  
**NC State Homecoming**, Oct. 25-31  
Preparing for Climate Change, Oct. 26  
Careers in Sustainability Workshop, Oct. 28  
The Exposome: Opportunities for Toxicology, Oct. 29  
**Composting Workshop**, Oct. 29  
**Harrelson Hall Farewell Tour**, Oct. 30  
Stewards of the Future: Water, Nov. 2

Goodnight Scholars Presents: Derreck Kayongo, Nov. 2  
Fred and Joan Barkalow Distinguished Lecture, Nov. 4  
Whose Earth Is It?, Nov. 10  
Solar Energy Sculpture Celebration, Nov. 13  
Innovative Women Conference, Nov. 13  
DIY Recycled Paper Origami Event, Nov. 15  
America's First Forest, Nov. 16  
Fidelity Investment Series: Vivek Wadhwa, Nov. 17  
Innovation Hall Breakfast, Nov. 18  
FarmHer: A New Image for Agriculture, Nov. 18  
Dinners With Purpose, Nov. 18  
Net Impact Lunch N Learn: Francine Espinoza, Nov. 19  
Sustainability in Research Seminar Series, Nov. 19  
Acid Rain: The Long, but Unfinished Journey from Discovery to Political Action, Nov. 19  
**Global Issues Seminar: The Energy We Consume**, Nov. 19  
Coffee & Viz – Dr. Matthew Booker, Nov. 20  
NC State Plant Walk, Nov. 20  
InnovateHER with the SBA, Nov. 20  
FoodCon, Dec. 2,  
Net Impact Social, Dec. 4  
**Facilities Recognition Luncheon**, Dec. 16

## 2016

**NC State Stewards Retreat**, Jan. 5  
Safe Maize For Africa, Jan. 13  
**Enhancing Farm Profitability Workshop**, Jan. 19  
**Sustainability Town Hall**, Jan. 20  
Forest Productivity & Sustainability in Southeastern United States, Jan. 27  
US-China Collaboration on Air Pollution Control and Energy Efficiency, Jan. 27  
Rise. Resist. Repeat., Jan. 27  
Visualizing the Impact of Future Climate on Pine Forests, Feb. 2  
Disappearing Frogs Project Exhibit Opening Reception, Feb. 3  
The Global Eradication of Malaria, Feb. 3  
Social Entrepreneurship Interest Meeting, Feb. 4 and 10  
Triangulating Water Supply, Forests and Urbanization in the Triangle, Feb. 4  
WolfPack Your Lunch: Think Like a Designer, Feb. 5  
NC State B Corp Clinic Launch, Feb. 5  
Developing GENFORES, a Tree Improvement Cooperative Based on Small-Scale Forestry, Feb. 10  
What the Dog Knows, Feb. 15  
Designing Landscapes of Urban Change, Feb. 17  
**Sisterhood Dinner**, Feb. 19  
**Make-A-Thon**, Feb. 19-21  
Net Impact Lunch, Feb. 23  
Environmental Impacts of Rapid Urbanization in China, Feb. 24  
RTI - NC State Researchers Collaboration Breakfast, Feb. 25  
Sustainable Living in Residence Halls or Apartments, Feb. 25  
Integrating Satellite and Ground Observations to Understand Global Terrestrial Ecosystem Productivity in the 21st Century, Feb. 25  
Food Waste and Hunger Forum, Feb. 25  
Robin Moore: In Search of Lost Frogs, Feb. 25  
Energy That Works Speaker Series, Feb. 25  
Sustainable Operations Management Workshop, Feb. 26 – 28  
Stellar Student: Brian Iezzi, March 1  
Borlaug Lecture: The Future of Whales and Whaling, March 1  
Designing Resilient Landscapes: Patterns of the Past, Visions of the Future, March 3  
Coffee & Viz - Dr. Robin Grossinger, March 4  
Recycling and Shredding Drive at NC State, March 9

**Design Day**, March 14  
Science of Shale Gas/Oil: Latest Evidence on Leaky Wells and Methane Emissions, and Implications for Energy Policy, March 15  
Last Barn Dance, March 15  
Nature, Science, and the Race to Save Ourselves, March 16  
**WRRRI Annual Conference and NCWRA Symposium**, March 17-18  
NC State Urban Design Conference, March 18  
Luncheon - Sustainable Agriculture Graduate Student Association, March 18  
**Kappa Delta Shamrock 'N Score**, March 19  
The Art and Science of the Duck Stamp, March 21  
Future of North Carolina's Barrier Islands, March 22  
Emerging Plant Disease and Global Food Security Symposium, March 23  
Lake Raleigh Woods Information Sessions, March 23  
US-China Collaboration on Air Pollution Control and Energy Efficiency, March 23  
River Flows, Fish, and the Things We Do to Them, March 24  
Film Screening: How to Let Go of the World and Love All the Things Climate Can't Change, March 29  
Overconsumption Landfill Awareness Project, March 31  
**Oak City Revolution**, April 2  
Soul Garden Little Free Library Workshop, April 3  
Postharvest Handling for Enhanced Shelf Life Workshop, April 4  
What the Elephants are Saying, April 4  
**Postharvest Handling for Enhanced Shelf Life Workshop**, April 4 and 6  
**Navigating the USDA GAP Audit**, April 4  
Earth Month Tunnel Painting, April 5  
The Environment and Mental Health: The Positive Impact of Nature on Wellbeing, April 6  
Friday at the Farm, April 8  
State of the Sciences: Museum Takeover, April 8  
Zero-Waste Kay Yow Spring Football Game, April 9  
**Service Raleigh**, April 9  
**Eta Omicron Cookout**, April 9  
**Rubbage Ride**, April 9

**Live & Local: Earth Day 2016**, April 9  
**Enhancing Farm Profitability Workshop**, April 9  
**Dash for Trash**, April 10  
Good Agricultural Practices Workshop: Navigating the USDA GAP Audit, April 11  
Climate Reality, April 11  
Sustainability in Research Seminar Series, April 12  
Change Maker Network, April 12  
Dinners with Purpose featuring Robin Emmons, April 12  
**Earth Fair**, April 13  
**Aquaculture Tour for Extension Educators**, April 13  
Compost Schompost, April 13  
Energy That Works: Bioenergy, April 13  
Canis soupus: Hybridization Between Eastern Coyotes, Wolves and Dogs, April 14  
**Green Brick Awards**, April 15  
Great Animal Orchestra Symphony, April 17  
Campus Sustainability Tour, April 18  
Global Engagement Exposition, April 19  
Perinatal Environmental Exposures: Effects on Metabolic Homeostasis and the Epigenome, April 19  
State Energy Conference, April 20 – 21  
NC State Net Impact Lunch n Learn, April 20  
Responsible Textiles, April 20  
Business of Social Innovation, April 21  
Cleantech Connect Career Fair, April 21  
Farm Feast, April 21  
**Just for Me: Sustainability Edition**, April 21  
Earth Day Canoe Challenge, April 22  
College of Veterinary Medicine Open House, April 23  
Earth Yoga, April 24  
Film Screening: Poverty Inc., April 25  
**West Campus Last Day of Classes Party**, April 25  
**Big Food Night**, April 26  
NC State Meetup - Capital City Bike Ride, May 6  
Bike to Work Day Pit Stop, May 20  
**NC Growing Together Apprenticeship Orientation**, May 20  
**Business Services Spring Lunch**, May 24  
**Farm to Fork**, June 3-5  
**Juntos Summer Academy**, June 20-24



# ACKNOWLEDGMENTS

## AND CONTACT INFORMATION

NC State's Annual Sustainability Report is produced on behalf of the Sustainability Council by the University Sustainability Office.

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- Chair of Communications Working Group: Mark Minor, Assistant Vice Chancellor for Marketing and Communications
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**FROM CAMPUS TO COMMUNITY**

NC State engages students, faculty, staff and university partners in preparing for a more sustainable future.







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**[go.ncsu.edu/SustainabilityReport](http://go.ncsu.edu/SustainabilityReport)**



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