

# ANNUAL SUSTAINABILITY REPORT

2013-2014



**ENGAGING**  
CAMPUS AND COMMUNITY  
IN PREPARING FOR  
A MORE SUSTAINABLE  
**FUTURE**

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# FROM THE CHANCELLOR



AT NC STATE, we solve global challenges and create economic, societal and intellectual prosperity. These advances result in a better, more sustainable future for our campus, state, nation and world.

As you will discover in this 2013-2014 Annual Sustainability Report, sustainability at NC State has never been more innovative or far-reaching. Our students, faculty and staff are putting to work sustainable solutions, tackling head-on the challenges that will define our future.

This year the university adopted a campus-wide sustainability policy, reduced campus energy and water use, increased waste reduction efforts, and boosted student engagement to an all-time high. Sustainability is helping drive down costs, improve efficiency, fuel research breakthroughs and equip students with real-world experience for impactful careers.

This sustainability progress and momentum continue to earn local and national recognition for NC State, including designation by the Princeton Review as one of the nation's greenest colleges as well as the nation's fourth Best Value Public College.

A spirit of innovation and purpose has created an NC State that is leaner, smarter and stronger than ever before. As some of the world's brightest minds continue thinking and doing at NC State, expect nothing less than a brighter, more prosperous future for us all.

Randy Woodson  
Chancellor

# FROM THE CAMPUS ENVIRONMENTAL SUSTAINABILITY TEAM

A UNIVERSITY that's leaner, smarter and stronger is better able to achieve its mission, and NC State's enduring commitment to sustainability is helping accomplish exactly that. As this 2013-2014 Annual Sustainability Report highlights, NC State is more sustainable than ever with many of these advances in sustainability helping the university grow in size, quality and efficiency.

This year's accomplishments in academics and research, community and culture, energy and water, green development, purchasing and waste reduction, and transportation are the result of growing campus-wide collaboration around sustainability.

As you will learn, our students, faculty and staff are coming together to think and do -- and it's creating sustainability successes that NC State can celebrate.

Produced on behalf of the Campus Environmental Sustainability Team by the University Sustainability Office, this year's report reflects progress in year three (July 1, 2013 to June 30, 2014) of the university's five-year Sustainability Strategic Plan.

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# AT A GLANCE

## 2013-2014 NC STATE SUSTAINABILITY HIGHLIGHTS



### ACADEMICS & RESEARCH

- Students took on **real-world learning** opportunities such as report auditing, upcycling and conserving energy and water in an on-campus business, [pages 7-9](#)
- Poole College of Management debuted its **Sustainability Initiative**, [page 8](#)
- U.S. Departments of Interior, Energy & Agriculture announced NC State as hubs for sustainability research, [pages 6 and 8](#)



### COMMUNITY & CULTURE

- NC State's Sustainability Fund **awarded its first \$30,000** to on-campus projects, [page 14](#)
- NC State was named a **Green College** and fourth **Best Value Public College for 2014**, [page 40](#)
- Survey reveals NC State's **sustainability commitment influences students' decision to attend** the university, [page 15](#)
- University's greenhouse gas **emissions dropped 13.5 percent** from 2008 to 2013, [page 15](#)
- **Change Your State** initiative and the NC State Stewards sustainability ambassadors launched, [page 14](#)



### ENERGY & WATER

- **29 percent campus energy use decrease** since 2002-2003 and 12 percent decrease since last fiscal year, [page 21](#)
- **46 percent campus water use decrease** since 2001-2002 but a 6 percent increase since last fiscal year, [page 21](#)
- Campus winter break **energy savings topped \$288,000**, [page 20](#)



### PURCHASING & WASTE REDUCTION

- **47 percent of campus waste was diverted** from landfills through recycling, reuse or composting, [page 27](#)
- Students helped implement pilot **programs to reduce specific types of campus waste**, [pages 24-25](#)
- Wolfpack fans **recycled a record 85,480 pounds** at home football games, [page 26](#)
- **27 percent of food purchased** for University Dining halls was **from local sources**, [page 27](#)



### TRANSPORTATION

- Nearly **3 million passenger boardings** were made on the Wolfline campus bus, [page 32](#)
- Bike share interest to grow due to several efforts, including the **student-led Quad Bikes program** for residents of the Honors Village, [page 31](#)



### GREEN DEVELOPMENT

- Yarbrough Steam Plant earned **LEED Silver Certification**, bringing the total campus LEED certified space to 285,085 square feet, [page 35](#)
- The final phase of **Wolf Ridge Student Apartments**, which anticipate LEED Silver certification, opened on Centennial Campus, [page 36](#)
- More than 200 small construction or renovation projects on campus utilized **newly-created sustainability guidelines**, [page 36](#)



# ACADEMICS & 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.



***Student project boosts sustainability at Howling Cow Creamery***  
In spring 2014, 15 students in a Food Science class analyzed energy and water usage at NC State's Howling Cow Creamery, which processes up to 400,000 gallons of milk each year into ice cream and other dairy products. The students' research helped improve the efficiency and sustainability of the case washer, which the creamery uses to cleanse milk storage cases.



**Innovation Transforms Lives in Rwanda**  
Pulp and paper sciences student Tyson Huffman is leading an effort to manufacture affordable sanitary pads in Rwanda, where the innovation will improve women's health, access to education and livelihood.



**Research Aids N.C. Coastal Areas**  
NC State civil and environmental engineering researchers are exploring renewable energy possibilities, flood modeling that helps prepare coastal areas for storms, and ways to reduce sand dune erosion.



**NC State Becomes Hub for Climate Science**  
NC State houses the [U.S. Department of Interior's Southeast Climate Science Center](#) and the [U.S. Department of Agriculture's Southeast Regional Climate Hub](#), which study climate change impacts.



**New Species Discovered**  
NC State professor Dr. Roland Kays was among zoologists that discovered the olinguito, the first new carnivore species discovered in the Western Hemisphere in 35 years.



**Study Advances Sustainable Strawberries**  
NC State crop science research in strawberry farming could boost North Carolina, the country's third leading strawberry producer, to the nationwide leader in strawberry production with fewer chemicals.



**Research Improves Solar Efficiency**  
Solar energy breakthroughs by NC State physics and electrical engineering researchers include [improved solar design](#) and [stacked solar cells](#), which improve [solar efficiency](#) and affordability.

# 2013-2014 HIGHLIGHTS



## NC STATE NAMED HOST FOR NEXT GENERATION POWER ELECTRONICS MANUFACTURING INNOVATION INSTITUTE

In January 2014, President Barack Obama announced that the U.S. Department of Energy tapped NC State to lead a \$140 million advanced manufacturing institute that will unite academic, government and industry partners in an effort to revolutionize energy efficiency across a wide range of applications, including electronic devices, power grids and electric vehicles.

## PACKLINK CONNECTS STUDENTS TO REAL-WORLD SUSTAINABILITY EXPERIENCE

With Packlink, students don't have to travel far to obtain real-world experience in sustainability. This online listing of campus sustainability projects allows students to select projects and skill development that interests them. Among the campus projects that students completed in Packlink's first year are a comprehensive guide to invasive species at Lake Raleigh, online sustainability map, microgrid design and sustainability videos.

## POOLE COLLEGE OF MANAGEMENT ADVANCES NEW SUSTAINABILITY INITIATIVE

In its first year, NC State's Poole College of Management Sustainability Initiative added its first director and launched a year's worth of sustainability events and initiatives. The college's partnership with More Than Money Careers now provides a career e-learning platform for NC State students and alumni to assess skills, passions, compatible career options and apply for impactful jobs. The college's faculty have been developing sustainability-related course modules and research funded by the Sustainability Initiative's grant program. The Sustainability Initiative also launched the North Carolina Sustainability Connection, which showcases the innovation and impact of N.C. sustainable businesses as well as connects entrepreneurs, business people, communities and citizens. The North Carolina Sustainability Center, which created the Connection, transferred its role as an online community to NC State in April 2014.



## STUDENTS STUDY SUSTAINABILITY IN NEW ZEALAND

Two dozen NC State students traveled to New Zealand in summer 2014 as part of a course called Sustaining Human Cultures and Natural Environments, which taught about conservation, sustainable development and included service learning opportunities such as helping revegetate beach grass.

## ADDITIONAL 2013-2014 SUSTAINABILITY-RELATED RESEARCH

- Development of a new processing technique that makes light emitting diodes (LEDs) brighter and more resilient (College of Engineering and College of Sciences)
- Analysis of Dan River water quality following N.C. coal ash spill (Dept. of Soil Science)
- Creation of a new open-source energy optimization model (Dept. of Civil, Construction and Environmental Engineering)
- Discovery that diverse bee species significantly increase blueberry crop yield (Dept. of Entomology)
- Development of enhanced water quality monitoring techniques that will better inform policy decisions about water (Dept. of Biological and Agricultural Engineering)
- Exploration of the most efficient ways to capture and control wind power as an energy source (Dept. of Electrical and Computer Engineering)
- Creation of a simple technique that may drive down the cost of biofuel production (Dept. of Chemical and Biomolecular Engineering)
- Analysis of farmers' skepticism of climate change and how it might impact future crop yields (Dept. of Agricultural and Resource Economics)
- Exploration of the impact of today's droughts on future soybean and corn crop yields in the U.S. Midwest, one of the globe's leading suppliers of these vital crops (Dept. of Agricultural and Resource Economics)
- Discovery that protecting 17 percent of Earth's land may preserve more than two-thirds of its plant species (Dept. of Biological Sciences)
- Identification of key factors necessary to maintaining Raleigh's tree cover and urban forests (Dept. of Forestry and Environmental Resources)
- Exploration of the relationship between climate change and the sustainability of wild animals (Dept. of Forestry and Environmental Resources)
- Development of a small protein molecule that stops inflammation and may also be effective in stopping the movement of lung-cancer cells (College of Veterinary Medicine)
- Discovery of a one-atom thick film that could make hydrogen energy an affordable alternative fuel (Dept. of Materials Science and Engineering)

## STUDENTS FIND TRANSIT, WALKABILITY BARRIERS TO TOWN'S GROWTH

Why are young adults moving away from one Raleigh suburb? Lack of walkability and access to transit is part of the reason, according to NC State landscape architecture graduate students who analyzed the town of Fuquay-Varina's planning and demographics data as part of a semester-long project. Students concluded the project with a presentation of their findings to the town's Board of Commissioners, suggesting increased availability of sustainable transit services.



## DESIGN STUDENTS UPCYCLE CAMPUS BANNERS

Instead of sitting in storage or being discarded, NC State's 125th anniversary vinyl street banners became a sustainability learning opportunity for an industrial design class in fall 2013. Students were challenged to create something new from an old product, transforming the banners into nearly 20 useful products including an umbrella, clock, swinging chair, wallet and shoes.



## Students Help N.C. Company Save Energy, Improve Processes

In partnership with the Industrial Assessment Center at NC State, engineering students provided a N.C. manufacturing facility with a free assessment of its manufacturing processes. In addition to improving the facility's productivity, the project provided an opportunity for students to apply information learned in the classroom -- from ergonomics to Six Sigma processes -- in a working environment.



## Study Analyzes Cars, Carbon

Mass adoption of electric vehicles has many benefits but won't significantly reduce U.S. overall carbon emissions according to a study by NC State civil engineering researchers.



## Accounting Students Audit Sustainability Report

Twenty-five student teams from Poole College of Management's Advanced Auditing class audited NC State's 2012-2013 Annual Sustainability Report as part of a spring 2014 class project. Students spent 1,100 hours examining all sections of the report for process, accuracy and recommendations for improvement.



## Researcher Combats Hunger In Zambia

NC State's Dr. Mary Ann Lila teaches villagers how to use low-cost, solar-powered dehydrators to create nutrient-rich powder from crops so that supplements are available during food shortages.





## 2013-2014 TACTICS

# 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:** Recruit participation from each college for a college-based sustainability coordinators group that will serve as the Academics and Research advisory team/working group for the Campus Environmental Sustainability Team (CEST). Select a chair of this group to serve as a liaison to CEST.

**PROGRESS:** A group of individuals representing 8 university colleges and the Finance and Business division met several times to discuss the theme of sustainability in academics and research. Because the group is still developing, this tactic will be carried into fiscal year 2014-2015.

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

**TACTIC:** Establish the leadership, curriculum and programming for University's Housing newest student living and learning communities: EcoVillage and Wellness Village.

**PROGRESS:** Both villages had a successful first year of operation, with approximately 100 students representing many majors. Residents in both villages completed an academic course customized for their respective village and attended a variety of educational and social programs. Over spring break, 9 EcoVillage residents participated in the inaugural Sustainable Planning & Urban Development Sightseers (SPUDS) trip to Boston.

**TACTIC:** Include sustainability questions in the incoming freshman and transfer student surveys to track importance of and interest in sustainability.

**PROGRESS:** Sustainability was included in the university's incoming freshman and transfer student surveys. Results for fall 2013 showed that 62% of freshman and 65% of transfer students indicated sustainability had an influence on their decision to attend NC State. The University Sustainability Office sent welcome information to individuals who requested more details about environmental/sustainability organizations or activities.

**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 Environmental Sustainability Team (CEST) working groups.

**TACTIC:** Align and coordinate efforts of CEST and the Energy Council.

**PROGRESS:** Updates are communicated between the groups. Formal alignment of these efforts will be carried into fiscal year 2014-2015.

**TACTIC:** Coordinate an energy conservation plan and communications to address potential utility budget shortfall.

**PROGRESS:** With a \$1.58 million utility budget cut and record-setting low temperatures this winter, NC State faced a utility budget shortfall. Energy Management and the University Sustainability Office coordinated a spring 2014 energy-saving emphasis that implemented strategic energy conservation programs while engaging the campus community in energy and water saving efforts.

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

**TACTIC:** Fully launch PackLink, an online resource to match students with sustainability projects, and track students completing sustainability-related projects for campus departmental clients.

**PROGRESS:** PackLink facilitated 14 sustainability-related projects completed by students. Through working on sustainability-related campus projects, students gained applied learning and career experience and campus partners were able to complete projects for which they might not have had resources.

**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:** Complete a plan for development, deployment and demonstration of smart grid and smarter buildings at NC State.

**PROGRESS:** The Smart Grid Feasibility Study was completed in May 2014 and provides recommendations for establishing a smart grid demonstration on Centennial Campus. The plan includes research opportunities and the vision of NC State faculty addressing industry needs. Several meetings, including an open forum and charrette, provided the foundation for engaging partners.

**TACTIC:** Establish common portal or process for promoting sustainable careers across academic colleges.

**PROGRESS:** Poole College of Management's Sustainability Initiative brought to campus a program called More Than Money, which connects students with resources and tools for impact careers. During its pilot year, the platform was available to all NC State students and three campus workshops with the program's founder were offered to students, career counselors, faculty and alumni. The program will continue in fiscal year 2014-2015.

**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:** Implement the Strategic Space Reserve initiative to determine locations of underutilized/vacant academic space that could be repurposed with more efficiency to accommodate additional faculty and research.

**PROGRESS:** In January 2014, the University Space Committee reviewed progress of the initiative, which has been implemented and already used for new hires.

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

**TACTIC:** Integrate sustainability activities and projects into targeted courses.

**PROGRESS:** The University Sustainability Office worked with six courses during 2013-2014: STS 323 used Change Your State as the course's framework, ACC 550 audited the Annual Sustainability Report, ID 201 reused NC State 125th anniversary banners, Wood Wellness Village Independent Studies were led by Sustainability Office staff, a group of engineering senior design students focused on a campus microgrid, and a new course ARC 590-012 in fall 2014 will focus on obtaining LEED recognition for a campus building.

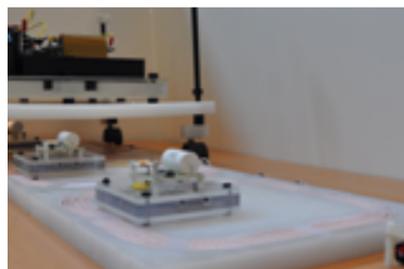
**TACTIC:** Build a partnership between CEST, University Sustainability Office and NC State's community engaged faculty fellows to connect service learning opportunities with campus operations.

**PROGRESS:** The Sustainability Office and the Office of Faculty Development discussed ideas for integrating sustainability with service learning, including the role of engaged faculty fellows. This tactic will continue into fiscal year 2014-2015.



### Engineering Students Design Green Roof

Four Biological and Agricultural Engineering students researched and designed a green roof for Carol Woods Retirement Community in Chapel Hill as part of their senior design project. When construction finished in April 2014, the retirement community began reaping benefits of the students' design such as extra insulation and more effective stormwater management.



### Building the Wireless Highway

NC State electrical engineering researchers developed new technology for transmitting power wirelessly, moving toward their goal of creating highway "stations" that recharge electric vehicles as the vehicles drive by.



### Plasma Could One Day Treat Drinking Water

NC State College of Engineering researchers are trying to harness plasma technology to treat water without using chemicals, a process that could one day remove contaminants in drinking water.



### Researchers Help Prepare N.C. Golf Course for World's Elite Players

The efforts of NC State crop scientists, led by Dr. Danesha Seth Carley, were on display during the 2014 U.S. Open at Pinehurst, where three years of research helped golf course managers determine what native grasses and plants would reemerge after a substantial renovation that improved the course's sustainability.

# COMMUNITY & 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 more in campus life while also having a positive impact in the community.



### ***Rubbage Ride Volunteers Beautify Campus***

*More than 110 participants collected 380 pounds of litter on campus during Service Raleigh's Rubbage Ride event on March 29, 2014. Nearly half of the litter was diverted from landfills through composting or recycling.*



### **Bamboo Sculpture Takes Flight**

Using bamboo harvested from a local grove in Durham, horticulture students built an ephemeral landscape sculpture at the future home of NC State's Gregg Museum of Art and Design.



### **Zero-Waste Krispy Kreme Challenge**

One of the university's largest student-led events once again earned Wolfpack Certified Sustainable recognition for sustainable event planning, including a waste diversion strategy that recycled or composted 4,431 pounds.



### **Sustainability Day Drives Energy Awareness**

The university's Campus Sustainability Day on Oct. 2, 2013, showcased more than a dozen alternative energy vehicles and debuted a campus contest to earn points and prizes with Joulebug, a mobile sustainability app.



### **Students Empower Micro-Entrepreneurs in Costa Rica**

Fourteen students traveled to Costa Rica over spring break as part of an Alternative Service Break trip that witnessed sustainable agriculture at work and linked micro-entrepreneurs to the growing network of People First Tourism, an NC State global initiative that connects people seeking genuine travel experiences with local micro-entrepreneurs.

# 2013-2014 HIGHLIGHTS



EcoVillage students built a living wall at a community urban garden.

## SUSTAINABILITY-RELATED LIVING AND LEARNING VILLAGES THRIVE IN FIRST YEAR

In fall 2013, University Housing opened [Wood Wellness Village](#) and [EcoVillage](#) as its newest student living and learning communities. While wellness village residents focused on activities around well-balanced living, EcoVillage residents participated in numerous sustainability community service activities, education seminars, socials and a [spring break sustainable living and urban development field trip](#) to Boston.

## SUSTAINABILITY FUND AWARDS INAUGURAL GRANTS

In May 2014, the student-led board of NC State's Sustainability Fund awarded \$30,000 of grant funding among five project proposals to improve campus sustainability. The grant funding is generated by a \$1.50 per semester student fee that students voted to create in 2012. This year's funded projects support expansion of campus bike sharing technology, construction of a sculptural solar energy system on Centennial Campus, installation of a solar trash compactor, development of a community garden near the College of Veterinary Medicine, and launch of a student group that will combat community hunger by delivering uneaten campus dining hall food to local nonprofits. Implementation for these projects concludes by summer 2015.

## CAMPUS SUSTAINABILITY POLICY, PROCEDURES ADOPTED

NC State issued a [university-wide sustainability policy](#) in February 2014, solidifying its commitment to advancing sustainability through the life of the university. Accompanying the policy are [sustainability standard operating procedures](#) that provide specific guidance for implementing the policy on campus.

## SUSTAINABILITY AWARENESS CAMPAIGN LAUNCHES

Change Your State, originally developed as an energy conservation campaign in 2010, was re-launched in August 2013 as a sustainability awareness campaign for NC State students, faculty and staff. With more than a dozen campus partners, the campaign educated about eight sustainability topics through numerous outreach events and initiatives, including a blog-based website viewed by nearly 9,000 readers in its first year.



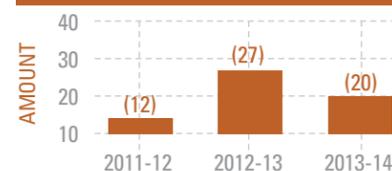
## NC STATE STEWARDS MAKE IMPACT IN FIRST YEAR

The inaugural class of 18 NC State Stewards, the university's student sustainability ambassadors coordinated by the University Sustainability Office, launched a plastic bag recycling program on campus, coordinated several campus sustainability events and implemented two energy-saving competitions: one in campus labs and another in residence halls.

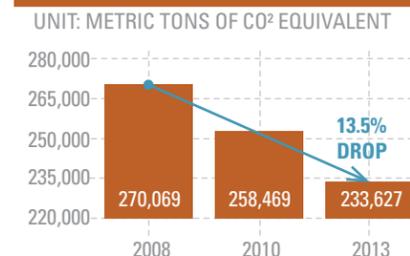
## SURVEY: PERCENT OF INCOMING STUDENTS FOR WHOM NC STATE'S SUSTAINABILITY COMMITMENTS INFLUENCED DECISION TO ATTEND



## WOLFPACK CERTIFIED SUSTAINABLE CAMPUS EVENTS



## NCSU GREENHOUSE GAS EMISSIONS



## COLLEGE MORE ACCESSIBLE FOR LOW-INCOME, RURAL STUDENTS

With support of a \$3 million gift, NC State launched a [Farm to Philanthropy](#) program in March 2014 to prepare rural N.C. students for university admission and provide scholarships. Earlier in January, the university also kickstarted the [College Pipeline Initiative](#), which will help low-income students enroll and succeed in college.

## ENERGY OUTREACH HELPS COMMUNITY, STATE

The NC Clean Energy Technology Center at NC State began offering [online training to equip first responders](#) for emergency situations involving electric vehicles. Also, this year Energy Solutions, a program of NC State's Mechanical and Aerospace Engineering department, provided energy surveys for 32 facilities and boiler assistance for 17 facilities as part of its mission to resource government, commercial and industrial facilities.



Painting Wolfpack spirit displays is one of the 40+ Homecoming events.

## HOMECOMING EARNS SUSTAINABLE EVENT CERTIFICATION

One of the nation's largest student-led homecomings became a Wolfpack Certified Sustainable event in 2013. Student planners of NC State's Homecoming received the certification for developing a comprehensive sustainability strategy that included community service events, development of a mobile app that enabled near paperless events, investment in reusable signs, and recycling and composting.



## Textile Students Compete To Design Repurposed Garments

As part of the first ReNew Fashion Challenge, College of Textiles students competed to design the best garment using repurposed, reused or recycled materials. The winning designs were made from material such as plastic bags, paper from old class workbooks and jacquard loom waste.



## Omega Psi Phi Tops Greek Life Sustainability

At the Greek Life Awards on Oct. 16, 2013, Omega Psi Phi won the inaugural Most Sustainable Chapter Award, which honors a chapter that has minimized its environmental impact while maximizing community service.



## EcoCar2 Team Competes in National Finals

At the EcoCar2 collegiate engineering challenge in June 2014, NC State's student team received the Spirit of the Competition Award. The team spent three years designing a vehicle with minimal environmental impact.



## Wolfpack Leads Arbor Day Celebration

NC State's College of Natural Resources hosted North Carolina Arbor Day at the State Farmers Market in Raleigh on March 22, 2014, distributing 1,500 tree seedlings and educating about the importance of trees.



## 2013-2014 TACTICS

# PROGRESS TOWARD STRATEGIC GOALS

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

**TACTIC:** Seek approval on a campus sustainability policy with accompanying standard operating procedures.

**PROGRESS:** NC State's Sustainability Policy, POL 04.00.09, was approved by the Board of Trustees on February 26, 2014. The Sustainability Standard Operating Procedure was approved on June 16, 2014.

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

**TACTIC:** None. STARS (Sustainability Tracking, Assessment & Rating System™) designation is granted every three years. NC State's next renewal will be in April 2015.

**PROGRESS:** None. During 2014-2015, NC State will revise its STARS report.

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

**TACTIC:** Formalize the campus Sustainability Fund's board and processes. The Vice Chancellor for the Division of Academic and Student Affairs and the inaugural Sustainability Fund Board will finalize the governance structure and bylaws as well as project submission, selection and accountability parameters.

**PROGRESS:** The Advisory Board was appointed, issued a campus-wide request for proposals and awarded \$30,000 in grant funding among five sustainability-related projects.

**TACTIC:** Establish regular communication between University Advancement, the University Sustainability Office and college-based sustainability programs.

**PROGRESS:** The Sustainability Office and college-based sustainability programs communicate regularly. Regular conversation with University Advancement has not yet developed.

**TACTIC:** Understand where the goals of NC State's Foundations Accounting and Investment Office overlap with sustainability.

**PROGRESS:** Early conversations have occurred with this office.

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

**TACTIC:** Launch the revised Change Your State awareness campaign promoting sustainable actions.

**PROGRESS:** Change Your State launched in August 2013 with different sustainability themes, messaging and partners for each month of the academic year.

**TACTIC:** Refine the Student Sustainability Attitudes Assessment survey to track the progress of the Change Your State campaign.

**PROGRESS:** The survey was completed in September 2013. Data analysis is underway with final results to guide Change Your State improvement over summer 2014.

**TACTIC:** Launch the NC State Stewards (student sustainability ambassadors) to conduct peer-to-peer education on campus.

**PROGRESS:** In its first year, 18 Stewards created impact through peer-to-peer education and team projects.

**TACTIC:** Distribute and communicate sustainability talking points to key individuals and organizations.

**PROGRESS:** Talking points were developed and shared with Legislative Affairs.

**TACTIC:** Begin creating the foundations for an employee sustainability ambassador program.

**PROGRESS:** This tactic was modified to provide resources for staff through a Wolfpack Certified Sustainable workplace toolkit, which has been piloted by several offices.

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

**TACTIC:** Continue to act as a catalyst for regional collaboration through participation in the UNC System Energy Program Challenge, Appalachian Energy Summit and the Southeast Sustainability Network.

**PROGRESS:** NC State remains an active participant in the UNC System Sustainability Alliance, Southeast Sustainability Network, Energy Leadership Challenge and Energy Summit. Staff attend relevant conferences and networking opportunities as budget allows.

## 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:** Identify CEST membership as original three-year appointments end.

**PROGRESS:** Reappointments will be aligned with the next revision of the university's Sustainability Strategic Plan. Therefore, this tactic has changed and will not be carried forward in its present form.

**TACTIC:** University Sustainability Office to provide support to CEST working group chairs on tactic development and areas of overlap.

**PROGRESS:** Mid-year and end-of-year progress meetings were scheduled to better address areas of overlap.

**TACTIC:** Coordinate with college- and division-based sustainability coordinators/directors to advise CEST's academics and research working group.

**PROGRESS:** The academic sustainability leaders group met twice and invited long term participation from each academic college.

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

**TACTIC:** Include sustainability in the university's Onboarding process for new employees.

**PROGRESS:** The Onboarding Center provides new employees with a campus sustainability map and may begin including a sustainability awareness video as part of employee orientation.

**TACTIC:** Enhance the visibility of sustainability in New Student Orientation and Wolfpack Welcome Week.

**PROGRESS:** Sustainability has a visible presence at Welcome Week events, and sustainability maps are available to orientation participants. Orientation counselors are trained on campus sustainability.

**TACTIC:** Include sustainability questions in the incoming freshman and transfer student surveys to track importance of and interest in sustainability among new students.

**PROGRESS:** Question is now included in the survey. This year 62 percent of freshman and 65 percent of transfer students indicated that NC State's commitment to environment and sustainability influenced their decision to attend the university.

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

**TACTIC:** Create a Wolfpack Certified Sustainable event planning guide that includes the existing campus zero waste toolkit.

**PROGRESS:** The new sustainability guide is available for campus event planners.

**TACTIC:** Create a sustainable workplace certification as part of the Wolfpack Certified Sustainable program.

**PROGRESS:** The Wolfpack Certified Sustainable workplace toolkit has been piloted by several offices.



### Sustainable Shack Debuts at Shack-A-Thon

Several student groups constructed a new shack at Shack-A-Thon, an annual campus fundraiser for Habitat for Humanity, from reclaimed wood, bamboo and thousands of plastic bottles from an NC State football game.



### Earth Month Features 30 Events

NC State celebrated the planet in April 2014 with 30 events focusing on some aspect of sustainability, ranging from the annual Earth Day celebration on the Brickyard to an Earth Day stressbuster for students.



### Pack Soccer Showcases Sustainability

At the Sept. 14, 2013 men's soccer game, NC State in partnership with 5 Rights Football Club increased sustainability efforts with robust recycling and fan engagement with local community organizations.



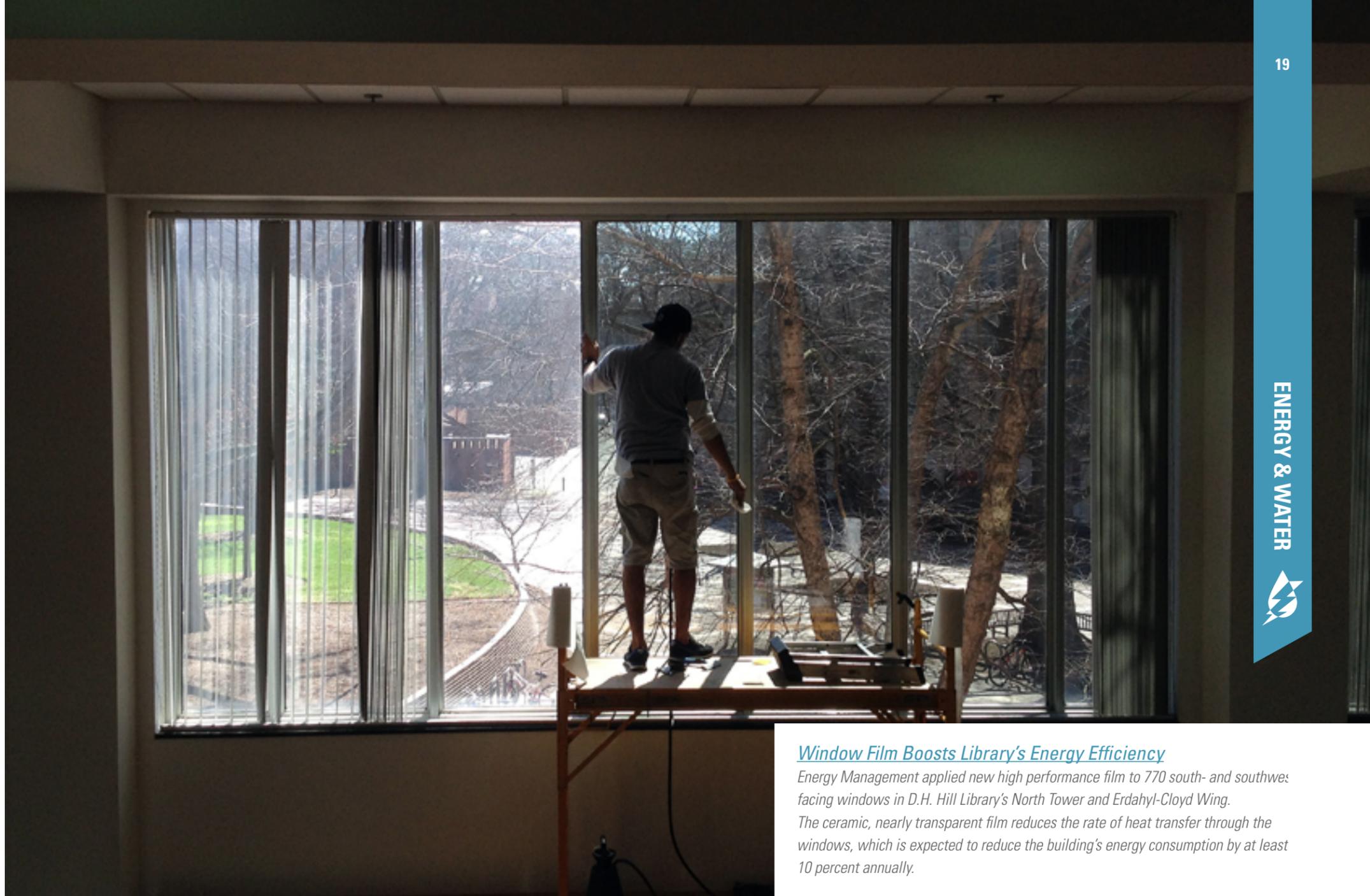
### Students Lead Week-Long Water Awareness Event

Two NC State seniors inspired students to care more about water-related problems by organizing a week of conservation-focused programs, including speakers, games to promote water awareness and a field trip to NC State's Water Research Lab.

# ENERGY & WATER

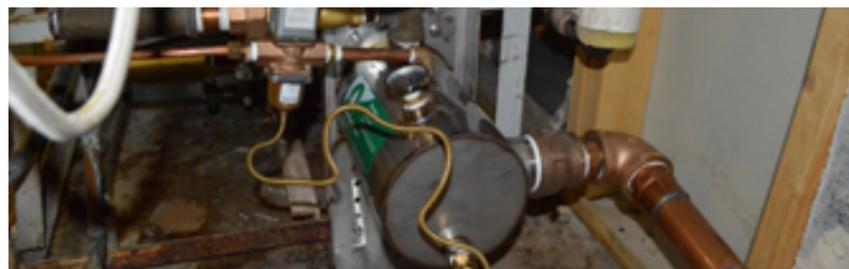
## ACCELERATING CAMPUS UTILITY EFFICIENCY AND COST-SAVINGS

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.



### Window Film Boosts Library's Energy Efficiency

Energy Management applied new high performance film to 770 south- and southwest-facing windows in D.H. Hill Library's North Tower and Erdahyl-Cloyd Wing. The ceramic, nearly transparent film reduces the rate of heat transfer through the windows, which is expected to reduce the building's energy consumption by at least 10 percent annually.



### Research Equipment Retrofit Reduces Water Use by 90 Percent

Before most research can begin, lab equipment must be sterilized by large autoclave machines that use more than half a million gallons of water annually. During spring 2014, Energy Management retrofitted seven of NC State's oldest and most inefficient autoclaves with water-saving devices that have cut water use by up to 90 percent.



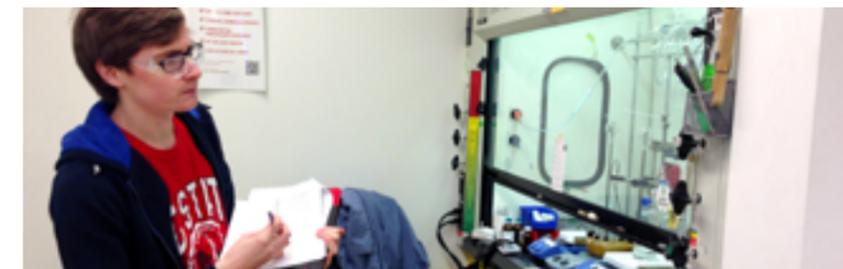
### Tours Raise Awareness About Energy

NC State began offering tours of its new Cates Utility Plant, which was renovated in 2012 to include energy-efficient combined heat and power technology.



### Students Compete to Conserve

In April 2014, residents in Metcalf, Bowen and Carroll residence halls reduced energy use by 25 percent and water use by 20 percent during the Tri-Towers Challenge, which was led by the NC State Stewards.



### Students, Researchers Shut the Sash for Safety, Energy Savings

Lab users were encouraged to shut open fume hoods, which are among the university's single biggest source of energy loss. During October 2013, lab users in Dabney Hall competed to see which side of the building could most reduce energy use and every Friday afternoon during the spring 2014 semester a student intern with Energy Management and Environmental Health and Safety walked through campus labs shutting open fume hoods before the weekend.

# 2013-2014 HIGHLIGHTS

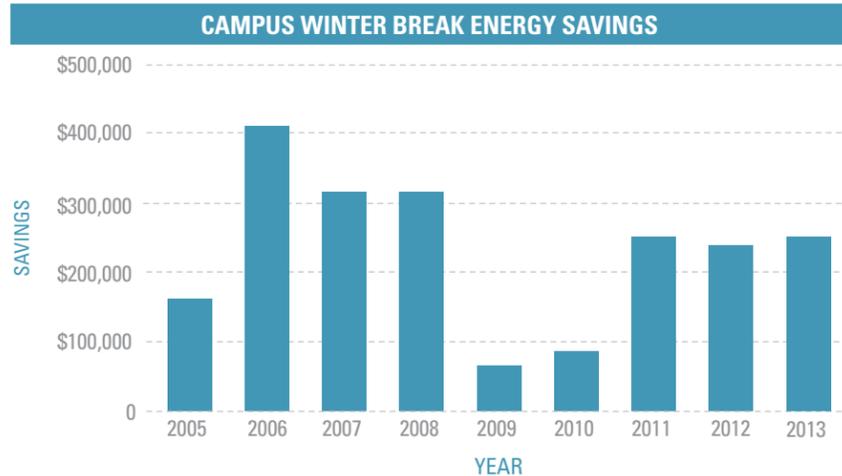


## NEW BOILERS INCREASE ENERGY EFFICIENCY, RELIABILITY

At Yarbrough Drive Steam Plant two existing 50,000 pound-per-hour boilers installed as early as 1949 were replaced with two new 100,000 pound-per-hour boilers, doubling capacity and improving efficiency from 68 percent to 82 percent. The new natural gas-powered boilers use No. 2 fuel oil as a backup fuel supply, which burns cleaner and operates more easily than the No. 6 fuel oil used by the old boilers. The renovation, financed through an energy performance contract, also included refurbishing the plant's last existing boiler and installing new auxiliary equipment throughout the plant, which was built in the 1920s.

## WINTER BREAK ENERGY SAVINGS TOP \$288,000

NC State students, faculty and staff pulled the plug, hit the switch and saved the university \$288,590 in avoided energy costs during winter break, Dec. 21, 2013 – Jan. 1, 2014. A campus-wide energy conservation program facilitated by NC State's Energy Management, the Winter Holiday Energy Saving Initiative reduced energy use by lowering thermostat temperatures in unoccupied buildings. Since the program began in 2004, nearly \$2.5 million in utility costs have been avoided.



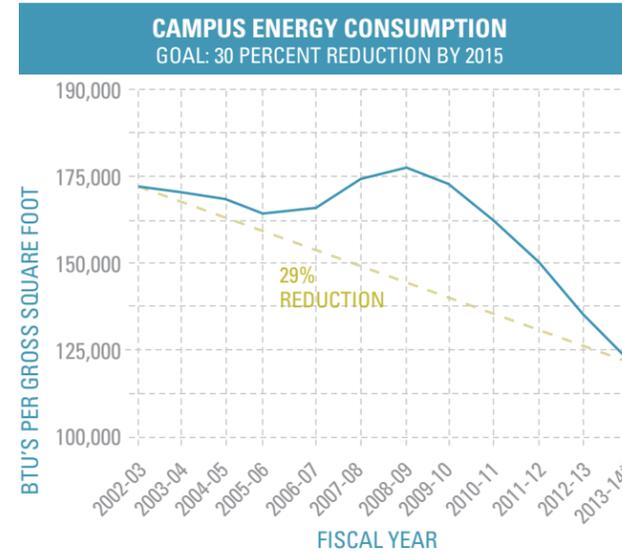
## Engineering Student's Design To Reduce Campus Water Use

NC State will save up to 5 million gallons of water annually thanks to a water recovery project designed by a Cates Utility Plant intern. During summer 2013 Blake Henard, a University of South Carolina student, came home to Raleigh to work at NC State, where she figured out a way to recover water runoff and recycle it to the facility's chilled water plant. Once implemented, it could save up to \$30,000 per year in water savings.

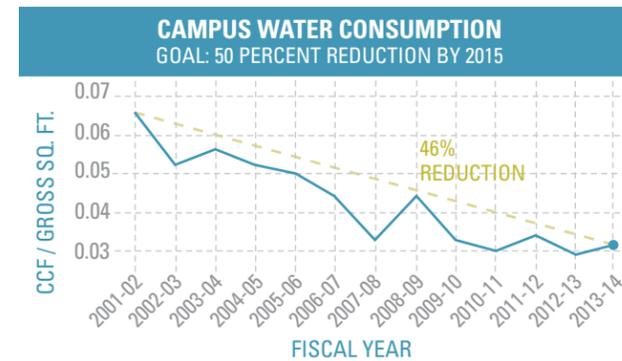


## Residence Hall Energy Efficiency Improves

During summer 2014, University Housing equipped Tri-Towers residence halls with wireless thermostats, occupancy sensors, and automatic humidity and temperature controls. Watauga Residence Hall's 30-year-old HVAC system was also replaced.



\*N.C. Department of Environment and Natural Resources changed its reporting requirements this year. Browse NC State's Annual Energy and Water Report for additional information: [go.ncsu.edu/energywaterreport](http://go.ncsu.edu/energywaterreport)



## LEDs BOOST ENERGY SAVINGS IN CAMPUS BUILDINGS

Throughout NC State's Constructed Facilities Lab, Energy Management replaced the building's older, inefficient interior lighting systems with longer-lasting LEDs, which reduce energy and maintenance costs. During this fiscal year LEDs were also installed in chandelier lights at the Park Alumni Center, in Nelson Hall stairwells and at College of Veterinary Medicine Main Building, Brooks Hall, Scott Hall, Poulton Innovation Center and Wolf Ridge Apartments.



## Water, Energy Use Upgrades Installed At Nelson Hall

Energy-efficient LED lighting, occupancy lighting sensors and water-saving dual flush toilets were installed in Nelson Hall in preparation for a fall 2014 course that will bring together students from business, engineering, architecture and environmental fields to lead the documentation process for Nelson Hall to earn LEED (Leadership in Energy and Environmental Design) for Existing Buildings certification by the U.S. Green Building Council.



## Dining Hall Adds Water-Wise Dishwashers

In 2013, Fountain Dining Hall began cleaning dishes with new water-saving dishwashers, which replaced inefficient 30-year-old dishwashers that were previously used.



## 2013-2014 TACTICS

# PROGRESS TOWARD STRATEGIC GOALS

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

**TACTIC:** Continue developing more accurate building-specific semester schedules to align building mechanical system operations with actual building use. This project includes two parts: buildings and infrastructure improvements. Affiliated Engineers was selected to perform the feasibility study.

**PROGRESS:** College of Textiles building and Monteith Engineering Research Center building schedules were surveyed by a student volunteer. Findings and recommendations were transmitted to campus HVAC schedulers for execution.

**TACTIC:** Define scope of the fiscal year 2013-14 self performance energy conservation contract. This project includes two parts, buildings and infrastructure improvements, and Affiliated Engineers was selected to perform the feasibility study.

**PROGRESS:** The engineering consultant has completed recommendation reports for energy conservation measures at 13 campus buildings and infrastructure improvements at Centennial Campus Utility Plant. Project scope has been determined and the project is awaiting financing.

**TACTIC:** Implement SCADA (supervisory control and data acquisition) modernization on all campus electric substations.

**PROGRESS:** SCADA was installed at Sullivan and Centennial Campus substations, and final SCADA design for Centennial Biomedical Campus substation is pending financing. Also, a smart grid master plan was completed for Centennial Campus. The upgrade would converge electrical distribution and building automation systems that will increase efficient operation.

**TACTIC:** Implement building automation system modernization at D.H. Hill Library, replacing a pneumatic-based building control system with more efficient direct digital controls and then recommission the building to ensure optimal energy efficiency.

**PROGRESS:** Work is on schedule and on budget with the final stage scheduled for 2014-2015.

**TACTIC:** Continue re-commissioning building heating ventilating and air conditioning systems on a rolling schedule.

**PROGRESS:** Mary Anne Fox Labs, David Clark Labs, Leazar Hall and Withers Hall were the first four recommissioned buildings resulting in \$525,000 per year of utility cost avoidance.

**TACTIC:** Continue steam trap survey and replacement program as funding is available.

**PROGRESS:** Two steam trap surveys and replacements were completed in winter 2014, resulting in \$36,000 per year of utility cost avoidance.

**TACTIC:** Work with Environmental Health and Safety to upgrade or remove/replace older, inefficient campus fume hoods. Provide shared funding to facilitate energy conservation while still maintaining rigorous health/safety standards.

**PROGRESS:** One fume hood at Jordan Hall was decommissioned in March 2014, and a financial incentive of \$1,000 was provided to a researcher at Polk Hall to downsize a fume hood. These two projects avoid \$6,000 in energy costs annually.

**TACTIC:** Facing a \$1.5 million utility budget reduction, implement a campus energy awareness campaign to encourage building occupants to conserve energy.

**PROGRESS:** A \$5,000 energy awareness campaign was launched, generating more than 2.5 million social media impressions from 11,000 unique users. The campaign also included campus newspaper advertising, website content, posters and promotion on the university's faculty and staff news website. Also, a water and energy competition between three residence halls was held in April 2014.

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

**TACTIC:** Develop reporting and tracking processes for campus contractor water use.

**PROGRESS:** No progress.

**TACTIC:** Develop improved reporting and tracking process for campus irrigation water use.

**PROGRESS:** No progress.

**TACTIC:** Continue implementation of wi-fi water meter reading technology to obtain real-time water consumption data. Integrate leak detection reporting to flag wasteful conditions.

**PROGRESS:** Wi-fi water meter reading technology was installed on a limited number of units. The technology is proprietary and the vendor filed for bankruptcy. Alternatives are under review.

**TACTIC:** Design and implement inlet air cooling condensate capture system at Cates Steam Plant to supplement cooling tower.

**PROGRESS:** Complete.

**TACTIC:** Install approximately 10 autoclave water-saving devices at Centennial Biomedical Campus (CBC).

**PROGRESS:** Seven water miser devices were installed on campus, reducing autoclave water use by up to 90 percent. Six additional units were purchased and will be installed on campus in fiscal year 2014-2015.

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

**TACTIC:** Complete the first year energy savings report for the Cates Steam Plant energy savings performance contract.

**PROGRESS:** The energy savings company (ESCO) reported energy savings achieved and a third party measurement and verification (M&V) agent concurred with the methods. This year 1 M&V report was submitted to the energy program of the N.C. Department of Environment and Natural Resources (NCDENR).

**TACTIC:** Complete the first year energy savings report for the 13-building energy savings performance contract.

**PROGRESS:** The ESCO reported energy savings achieved and a third party M&V agent concurred with the methods. This year 1 M&V report was submitted to the energy program of the N.C. Department of Environment and Natural Resources (NCDENR).

**TACTIC:** Continue the previous year's effort to install campus energy analysis software with exception reporting tools to more closely monitor building energy use. The software will integrate with the existing campus building automation system and will have the ability to populate kiosks and video displays with campus energy dashboards, which have been used to reduce building energy use up to 10 percent.

**PROGRESS:** Schneider Electric began implementing Building Analytics software at Partners III building.

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

**TACTIC:** In partnership with the Chemistry Department and Environmental Health and Safety, implement a fume hood education program and competition that incentivizes lab users to use fume hood management best practices, including shutting the hood's sash when the unit is not in use.

**PROGRESS:** As part of Energy Action Month activities in October 2013, Dabney Hall lab users competed to reduce energy use. In spring 2014, a student intern assisted weekly with closing open fume hood sashes while educating lab users on the importance of shutting the sash.

**TACTIC:** Communicate real-time building energy and water information to building occupants via kiosk displays. Prioritize integration at Hunt Library and Wolf Ridge.

**PROGRESS:** Through a contract with Schneider Electric, campus energy dashboard software is being implemented with data from up to 500 utility meters. The first meters are expected to come online in fall 2014.

**TACTIC:** Utilize NC State Stewards student program to perform campus energy and water conservation surveys.

**PROGRESS:** The NC State Stewards did not perform surveys but they did do energy outreach activities to encourage shutting the fume hood sash in teaching labs in addition to helping organize a residence hall energy and water conservation challenge.

**TACTIC:** Publish the 11th volume of the NC State Strategic Energy and Water Report for fiscal year 2013.

**PROGRESS:** Complete and available online at [go.ncsu.edu/energywaterreport](http://go.ncsu.edu/energywaterreport).

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

**TACTIC:** Solicit bids for natural gas from qualified energy marketers or energy suppliers for up to a five-year term.

**PROGRESS:** A contract was awarded to Colonial Energy to provide transport natural gas through 2015. In the first five months of launching the new procurement program, more than \$294,000 of cost avoidance was achieved through large volume hedge procurement implementation.

**TACTIC:** Perform electric rate analysis to determine optimal utility billing program for campus customers.

**PROGRESS:** No progress to report. Forward tactic to fiscal year 2014-2015.

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

**TACTIC:** Evaluate alternative campus utility rates (e.g. mock utility billing, electric demand billing, etc.) that will incentivize energy conservation.

**PROGRESS:** No progress.

**TACTIC:** Continue the ultra-low temperature (UTL) freezer rebate program in campus labs, upgrading two new energy efficient units with a stretch goal of installing five new units.

**PROGRESS:** An incentive was provided to replace one UTL freezer at Centennial Biomedical Campus.

**TACTIC:** Seek cost-share opportunities to install energy efficient LED lighting at campus research greenhouses.

**PROGRESS:** A researcher was approached about this opportunity, but budget constraints curtailed the project.

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

**TACTIC:** Continue the partnership with the OIT Green IT Committee.

**PROGRESS:** Conversations have been ongoing.

**TACTIC:** Add metering to Data Center II in Administrative Services III Building.

**PROGRESS:** Temporary data logging equipment will be installed to monitor energy usage once the building's capital project is completed.

# PURCHASING & 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.



### *Pizza Box Composting Debuts on Campus*

More than 2,300 pizza boxes were composted on campus between March and June 2014 as part of a pilot project sponsored by University Housing and NC State's Waste Reducing and Recycling. Students from the EcoVillage Living and Learning Community helped design and prepare two special composting dumpsters, which were placed near residence halls on campus.



### **Students Launch Plastic Bag Recycling**

More than 2,100 plastic bags were recycled on campus as part of a pilot recycling program developed by the NC State Stewards, a group of student sustainability ambassadors based out of the University Sustainability Office. Every week students empty bins located in four campus C-Stores and ensure the bags are recycled responsibly.



### **Campus, Community Recycle Together**

A March 2014 Community Recycling and Shredding Drive sponsored by NC State's Waste Reduction and Recycling recycled more than 3 tons of paper (about 53 trees worth) in addition to electronics and rigid plastics.



### **Audits Raise Awareness of Food Waste**

The NC State Stewards coordinated waste audits at Fountain Dining Hall to raise awareness of food waste. Using an app developed by Libraries staff, students calculated average waste per person of 3 ounces.



### **Graduate School Adds Paperless Application**

The Graduate School's new system for reviewing student applications is now completely electronic, resulting in more efficient review time and a reduction in paper use.



### **Jean Swap Reduces Clothing Waste**

Students donated unwanted jeans, which were washed, sorted and made available during a campus Jean Swap sponsored by Student Health and University Recreation.

# 2013-2014 HIGHLIGHTS

## FORMER RESIDENCE HALL FURNITURE FINDS NEW PURPOSE IN COMMUNITY

A summer renovation project at Avent Ferry and Lee Hall produced 18 tractor trailers of former residence hall furniture. University Housing, University Surplus and Waste Reduction and Recycling were able to divert all of this furniture from the landfill through public donation and partnership with several non-profit organizations, Wake County and charter schools.

## DINING HALL ADDS ANAEROBIC DIGESTER TO REDUCE WASTE

At Fountain Dining Hall, a new anaerobic digester processes customer food waste into greywater, which helps reduce grease residue in the building's pipes. Composting is still utilized for kitchen food waste in all campus dining halls and at On the Oval, a group of Centennial Campus restaurants that opened in fall 2013.



Volunteers helped create a zero waste Kay Yow Spring Football game by offering composting and recycling.

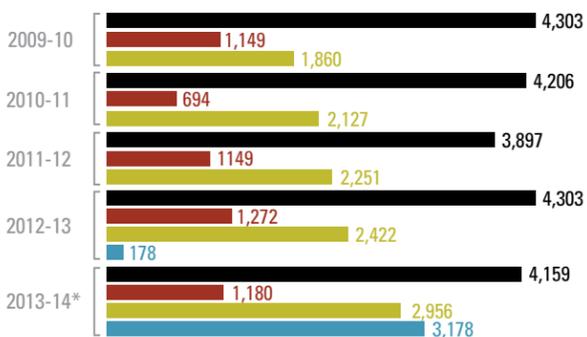
## FOOTBALL RECYCLING HITS ALL-TIME HIGH

During home football games in 2013, Wolfpack fans recycled a record 85,480 pounds — a 46 percent increase from the previous season — through the WE Recycle program. During the Kay Yow Spring Football Game, composting was offered for the first time inside the stadium. This pilot resulted in 30 bags of compost in addition to the 17 cubic yards of recyclables collected.

## NEW TECHNOLOGY ENHANCES CAMPUS WASTE REDUCTION EFFORTS, DATA

NC State's Waste Reduction and Recycling collection vehicles have been outfitted with weight scales and a fleet management and tracking system that will enable digital real-time data of campus waste and recycling. This technology also helps optimize routes, reduce fuel consumption and improve vehicle efficiencies.

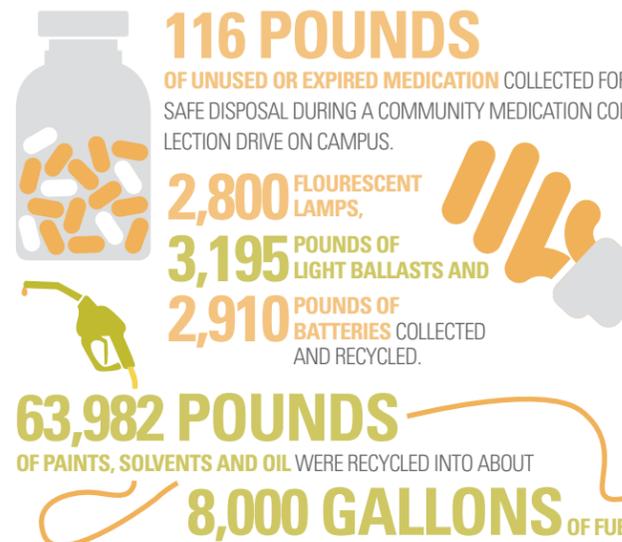
### TONS OF CAMPUS MATERIAL RECYCLED, COMPOSTED AND LANDFILLED



LANDFILLED  
COMPOSTED  
RECYCLED  
REUSED

\* The increase in recycling and reuse rates reflects the addition of recycling and diversion amounts from small campus construction projects, which tracked and reported waste diversion rates for the first time this year.

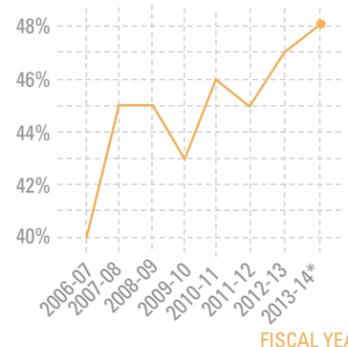
BY THE NUMBERS: Recycling and responsible waste management on campus diverted many items from landfills this fiscal year, including:



## UNIVERSITY DINING EXPANDS CAMPUS-GROWN FOOD INITIATIVE

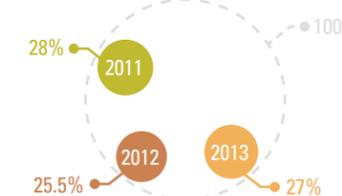
Campus-grown hydroponic lettuce, 150 pounds of campus-raised fish, and \$446,000 worth of milk from campus dairy farms — that's just the start of University Dining's continued efforts to increase its offering of campus-grown food. In summer 2013, 692 pounds of produce grown on NC State's Agroecology Education Farm made its way to campus dining halls. During summer 2014, the cooking staff at On the Oval developed a roof side garden where they grew herbs, fruits and vegetables to serve in this campus restaurant. These campus-grown food initiatives are in addition to enhanced local food procurement through Dining's "My Roots are at NC State" program, which includes local alumni food suppliers.

### PERCENTAGE OF CAMPUS WASTE DIVERTED FROM LANDFILL



\* Recycling and diversion rates from small construction projects were tracked and reported for the first time this year. With that addition, the campus diversion percentage is 65%. The diversion rate of 48%, which excludes construction recycling and diversion, is reported for consistency in comparison to prior years when construction waste was not tracked.

### LOCAL FOOD SERVED IN CAMPUS DINING HALLS



## Campus Material Repurposing Grows

This handrail removed from Harris Field during renovations was reinstalled at the Carter-Finley Stadium Park and Ride -- just one of many examples of campus material reuse.



## From Recycled Oil to Biofuel

A new Cease the Grease partnership between University Housing and NC State's Waste Reducing and Recycling allows residents at E.S. King Village and Western Manor Apartments to collect and recycle cooking grease and oil, which is converted into clean-burning biodiesel fuel.



## Students 'Pack N Give' to Local Nonprofits

As students moved out of residence halls in May 2014, they left behind 8,805 pounds of clothes, 1,029 pounds of nonperishable food that was donated to Feed the Pack campus food pantry, 386 pounds of books, and 6,821 pounds of furniture and housewares that were distributed to local nonprofits. In addition to donated items, 57,029 pounds of discarded material was recycled.



## Old Shirts Become New Shirts

The Graduate School recycled 600 old t-shirts through a clothing company that repurposes the fabric into new clothing items.





## 2013-2014 TACTICS

# PROGRESS TOWARD STRATEGIC GOALS

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

**TACTIC:** Add a bulk paper vendor to the Marketplace to ensure sustainable purchasing policies are enforced.

**PROGRESS:** Evaluate after Marketplace changes have been implemented. Goal is to get a paper provider that meets goal.

**TACTIC:** Work with Building Maintenance and Operations and the Utilities and Engineering departments on what is already being accomplished with regards to life cycle costing.

**PROGRESS:** A list of commodities is being developed for future analysis.

**TACTIC:** Begin implementing university-mandated language into contracts and bids over \$5,000.

**PROGRESS:** Bid document instructions for vendors were drafted and are under review. These instructions include waste and resource reduction for materials shipped to campus.

**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:** Evaluate Athletics' and recreation waste diversion opportunities. Establish zero waste stadium goals.

**PROGRESS:** A successful composting pilot effort was implemented at the Kay Yow Spring Football Game. NC State's Waste Reduction and Recycling has developed a zero waste proposal to advance zero waste efforts at Carter-Finley Stadium.

**TACTIC:** Pilot trash chute closure at residential building. Evaluate and develop a more accessible Greek Court recycling program.

**PROGRESS:** University Housing is evaluating operational considerations of trash chute closure. This tactic and the Greek Court recycling program will continue to be evaluated in fiscal year 2014-2015.

**TACTIC:** Perform benchmarking study of peer institutions and selected university programs.

**PROGRESS:** A student intern was hired to benchmark composting efforts. An additional intern will be hired to evaluate additional programmatic benchmarks against peer institutions.

**TACTIC:** Examine construction and demolition debris weight reporting process and incorporate to overall waste diversion.

**PROGRESS:** Campus demolition and construction guidelines have been updated, and a waste tracking sheet was created for Design and Construction Services and Repair and Renovation, which are collecting leftover and usable construction materials for reuse on campus. More efforts will be made to enhance reporting.

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

**TACTIC:** Create educational material about single-use plastic. Collaborate with University Dining on plastic bag and single use plastic reduction in campus stores.

**PROGRESS:** The NC State Stewards sustainability ambassadors created a plastic bag recycling program as a first step in reducing single-use plastic on campus.

**TACTIC:** Collaborate with University Housing to select a carpet vendor that will recycle carpet at the end of the academic year.

**PROGRESS:** A connection was made with Housing but there is no progress yet to report. This tactic will be continued in 2014-2015 fiscal year.

**TACTIC:** Examine collaborative partnerships for reuse opportunities during building upgrades and renovations.

**PROGRESS:** A partnership and process was created among Purchasing, Surplus Property, University Housing and Waste Reduction and Recycling to recycle large pieces of furniture and electronics that are being discarded from residence halls. It is now standard to recycle microfridge and electronic items.

**TACTIC:** Develop repurpose and reclamation clauses for furniture and large purchases.

**PROGRESS:** Social media is used currently to spread the word about available items. A formalized marketing plan will be developed to better communicate with campus and the community.

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

**TACTIC:** Gather annual tracking report specifications from vendors for Marketplace purchases that achieve Sustainable Purchasing Guidelines. Educate campus about sustainable vendors.

**PROGRESS:** Sustainability reports are available on all Marketplace vendors. A consistent report format will be normalized during fiscal year 2014-2015.

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

**TACTIC:** Gain consensus across academic and administrative units to reduce the number of desktop printers and educate and promote duplex printing.

**PROGRESS:** New duplex printing was offered as a default setting to all campus units and will continue in fiscal year 2014-2015. Multi-functional devices are being promoted to new customers as a more sustainable replacement for desktop printers.

**TACTIC:** Revise bid document to include language that encourages vendors to provide sustainable options for the items that are listed in bid documents.

**PROGRESS:** A draft is complete and in review.

**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:** Formally evaluate cost and personnel needs required to further expand campus-wide composting. Establish criteria and scope.

**PROGRESS:** The scope of the feasibility study for a campus biodigester includes analysis of type, quality and quantity of organic waste. Feasibility study should be complete in summer 2014.

**TACTIC:** Realign heavy equipment within Waste Reduction and Recycling to include a focus on composting.

**PROGRESS:** Complete. The heavy equipment supervisor will attend needed training to provide improvement for the Lake Wheeler Yard Waste Facility.

**TACTIC:** Identify and evaluate on-campus food waste producers for compost collection opportunities. Initiate pilot composting program for building occupants with long-term goal of developing a campus composting site.

**PROGRESS:** University Housing piloted successfully a pizza box composting project, and Athletics piloted post-consumer composting at the Kay Yow Spring Football Game.

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

**TACTIC:** Collect GIS outdoor recycling locations and investigate mapping tool.

**PROGRESS:** Data has been collected and an appropriate venue for sharing the data is being explored.

**TACTIC:** Complete placement of outdoor receptacles for Centennial Campus.

**PROGRESS:** This year 54 sets of paired waste and recycling bins were placed on Centennial Campus. Overall placement on Centennial Campus is 45 percent complete, and placement efforts will continue into fiscal year 2014-2015.

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

**TACTIC:** Acquire and implement a GIS-enabled tracking system with fork scales to provide more precise data for analysis.

**PROGRESS:** Complete. This technology enables digital real-time data of campus waste and recycling.

**TACTIC:** Utilize new measuring tools to determine material streams from campus customers, smaller campus capital projects and the campus community.

**PROGRESS:** New scales and tracking system were installed on Waste Reduction and Recycling collection vehicles. Data collection and analysis is in progress and will continue through 2014-2015 fiscal year.

**TACTIC:** Optimize waste reduction routes on campus, reducing fuel consumption and improving vehicle efficiencies.

**PROGRESS:** Complete. New data tracking software installed on collection vehicles serves a dual function of improving efficiency.

**TACTIC:** Conduct campus-wide building evaluations with University Housekeeping that will standardize and streamline indoor waste and recycling protocols.

**PROGRESS:** Evaluations have been completed on residence halls. The next steps include working with Housekeeping to identify high use buildings for evaluation and scheduling.

**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:** Continue the collaboration between University Dining and the Agroecology Education Farm to increase local purchasing and form strong ties with other campus departments.

**PROGRESS:** University Dining worked with the Agroecology Education Farm on a plan for season extension and plans to continue purchasing campus-grown produce from the farm as well as other campus sources when available.

**TACTIC:** Continue to pursue local connections with producers and growers.

**PROGRESS:** More local vendors have been added over the past year, bringing the local buying percentage to 27 percent with hopes of increasing that by 1 percent next fiscal year.



# TRANSPORTATION

## PROPELLING SUSTAINABLE TRANSPORTATION ON CAMPUS

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.



### Students Kickstart Free Bike Share

*In August 2013, a student-initiated pilot program began providing free bike share for residents of NC State's Honors Village living and learning community. With funding won in Student Government's "Think Outside the Brick" sustainability seed funding competition, student organizers developed Quad Bikes, which offers bike rental in renewable five-hour periods. Usage data and student interest was monitored with the future goal of expanding the program to other parts of campus.*



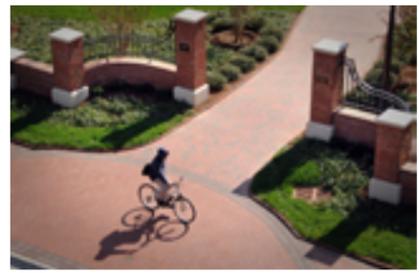
### **Woffline Bus Service Expands**

This year's expanded frequency and capacity on Woffline routes 1, 3, 8 and 9 has enabled more passengers to be transported to, from and around campus. Plus, good ridership on route 8's new Saturday service, which started in August 2013, has prompted the fall 2014 addition of Sunday service for route 8.



### **New Electric Car Service on Campus**

Gotcha Ride electric vehicles started traveling campus in spring 2014, providing on demand point-to-point transportation both on and off campus for NC State students, faculty and staff.



### **Campus Takes Commute Challenge**

During the 2014 Commute Challenge, 88 participants logged 32,452 miles of alternative commuting from April 1 - May 31, saving \$12,504 in commute costs and 16,638 pounds of CO2 emissions.



### **'FixIt' Stations Ease Bike Maintenance**

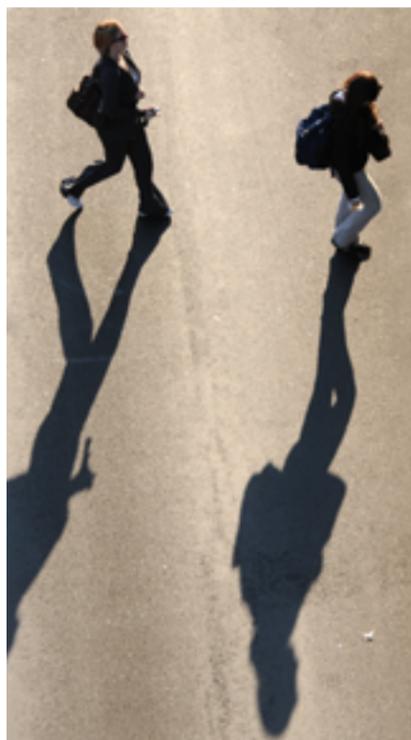
NC State has two new self-service bike repair stations at Carmichael Gym and Engineering Building II where cyclists can pump tires and tune up their bikes for safe commuting to, from and around campus. Also easing a cyclist's life on campus are new bike sharrows, which were added this year along Varsity Drive to remind cars and cyclists to share the road.

# 2013-2014 HIGHLIGHTS



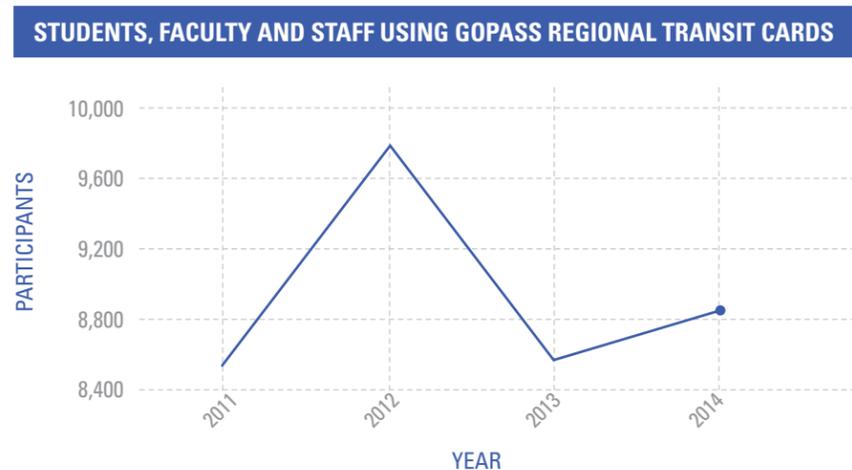
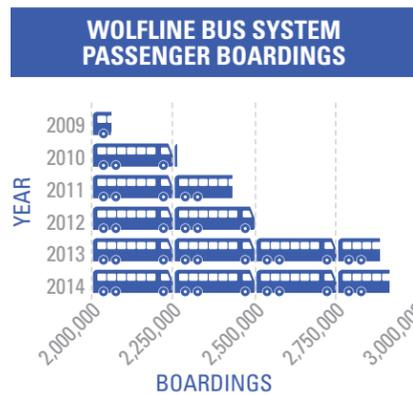
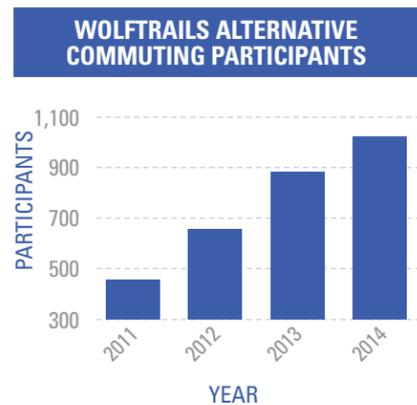
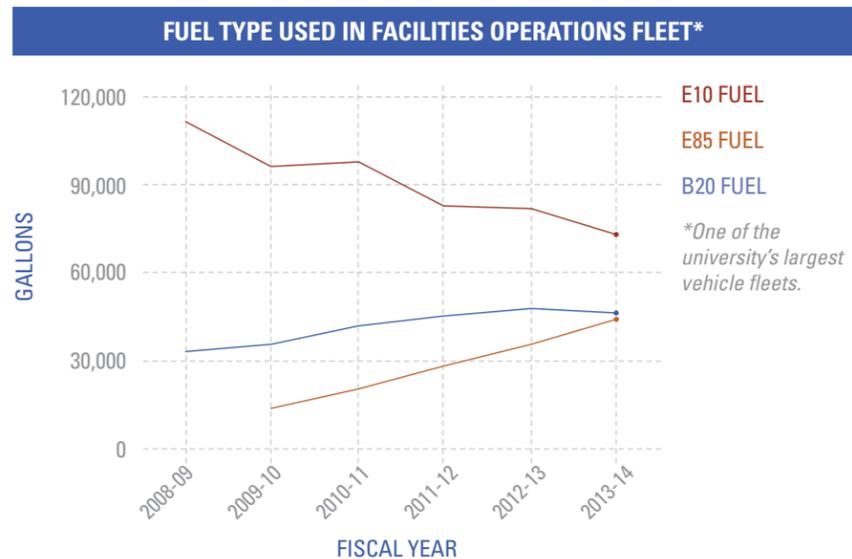
## CAMPAIGN PROMOTES BIKE, PEDESTRIAN SAFETY

In partnership with the N.C. Department of Transportation and the NC State Police Department, NC State Transportation coordinated a public awareness campaign in fall 2013 concerning bike and pedestrian safety. The "Watch For Me" campaign included signs and other messaging, promotion giveaways and in-field education and enforcement.



## SURVEY TRACKS CAMPUS COMMUTING

Results of an employee commuting survey in fall 2013 and student commuting survey in spring 2014 will help transportation planners better understand commuting patterns, usage and opportunities for encouraging alternative commuting.



## 2013-2014 TACTICS

# 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:** Finalize 2014 Physical Master Plan transportation updates.

**PROGRESS:** Updates have been completed and will be available when the 2014 Physical Master Plan is published.

**TACTIC:** Leverage the broader Physical Master Plan themes to inform future transportation program and project development initiatives per the 2011 Campus Bicycle and Pedestrian Plan and 2012 Campus Mobility Plan recommendations.

**PROGRESS:** These themes are now consistently relied upon for prioritizing and sequencing transit services and bike/pedestrian project funding.

**TACTIC:** Prioritize already identified bicycle and pedestrian projects and establish a sequencing/funding matrix that is adjusted every two years.

**PROGRESS:** A sequencing/funding matrix for bicycle projects, and incorporation of complementary City of Raleigh initiatives, were developed in spring 2014. A phasing timeline will be used in prioritizing future bike/pedestrian projects.

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

**TACTIC:** Initiate development of vehicle specifications for the next generation of Wolfline buses.

**PROGRESS:** The final report with survey results was completed in March 2014.

**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:** Complete the student commuter survey in Fall 2013.

**PROGRESS:** Final consultant report was completed in March 2014.

**TACTIC:** Analyze results from 2013 commuter surveys of students and employees to understand how transit and alternative commute trip programs are being used, identify future programmatic and service improvements, and improve marketing efforts.

**PROGRESS:** NC State TDM programs and impacts, informed by recent survey results, are monitored and refined quarterly as part of GoTriangle's grant-funded regional TDM initiative. NC State maintained its status as a "TDM hotspot" in 2013 and achieved a successful funding application in 2014 to enable program continuation.

**TACTIC:** Monitor Wolfline performance monthly with reports summarizing operations, ridership, productivity, on-time performance and fiscal year data trends (ongoing).

**PROGRESS:** Monthly, semester and annual reports are now Transportation standard operating procedures.

**TACTIC:** Initiate pilot program of bike racks on Wolfline buses (Routes 4, 6, 11) in Fall 2013.

**PROGRESS:** The initiative launched in fall 2013. Though no issues were reported with bicycle loading and unloading impacting bus schedules, more student feedback and usage patterns need to be tracked.

**TACTIC:** Begin Saturday daytime intercampus Wolfline service (Route 8) in Fall 2013.

**PROGRESS:** The Saturday daytime route started in August 2013 and averaged a productive 230 passengers per Saturday.

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

**TACTIC:** Implement top priority projects from the 2011 Campus Bicycle and Pedestrian Plan.

**PROGRESS:** A sequencing/funding matrix for bicycle/pedestrian projects was completed in Spring 2014 to ease implementation of top priority projects.

**TACTIC:** Monitor supply and demand of campus bicycle parking locations (ongoing).

**PROGRESS:** Continued monitoring of campus supply/demand of bicycle parking is ongoing. Since early 2013, a spreadsheet matrix tracks the deployment of new racks across campus.

**TACTIC:** Initiate pilot program, Quad Bikes, a satellite WolfWheels bicycle share program for Honors Village residents.

**PROGRESS:** The program launched in fall 2013. The first semester report revealed the project is well supported but will require ongoing commitment/management from Honors Village residents to continue beyond spring 2014. The program will continue in fiscal year 2014-2015.

**TACTIC:** Host bike and pedestrian safety "Watch for Me" educational and enforcement campaign on campus in October and November 2013.

**PROGRESS:** Transportation successfully collaborated with N.C. Department of Transportation and campus police on bicycle/pedestrian safety messaging, promotional giveaways and in-field education and enforcement in fall 2013. This effort will continue with a new cycle beginning in fall 2014.



## PROGRESS TOWARD STRATEGIC GOALS

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

**TACTIC:** Ensure all new light-duty vehicle acquisitions processed through University Purchasing comply with the U.S. Department of Energy's Energy Policy Act of 1992 (EPAAct), which requires 75 percent of all light-duty vehicle purchases to be alternative-fuel capable.

**PROGRESS:** Met with University Purchasing and determined that EPAAct Policy guidance is not currently practiced or managed on a campus-wide scale. A standard operating procedure will need to be established to ensure university-wide compliance. Recommendations for implementation are under review by university administration.

**TACTIC:** Create a university policy requiring the use of alternative fuel in all flex-fuel vehicles.

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

**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:** No progress. This tactic will be forwarded to fiscal year 2014-2015.

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

**TACTIC:** Create a Vehicle Idling standard operating procedure for university-owned assets.

**PROGRESS:** A standard operating procedure about vehicle idling was created and included in the campus wide sustainability standard operating procedures that the university approved in June 2014.

**TACTIC:** Design and install a small "No Excessive Idling" reminder decal in all university-owned vehicles.

**PROGRESS:** Complete.

**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.

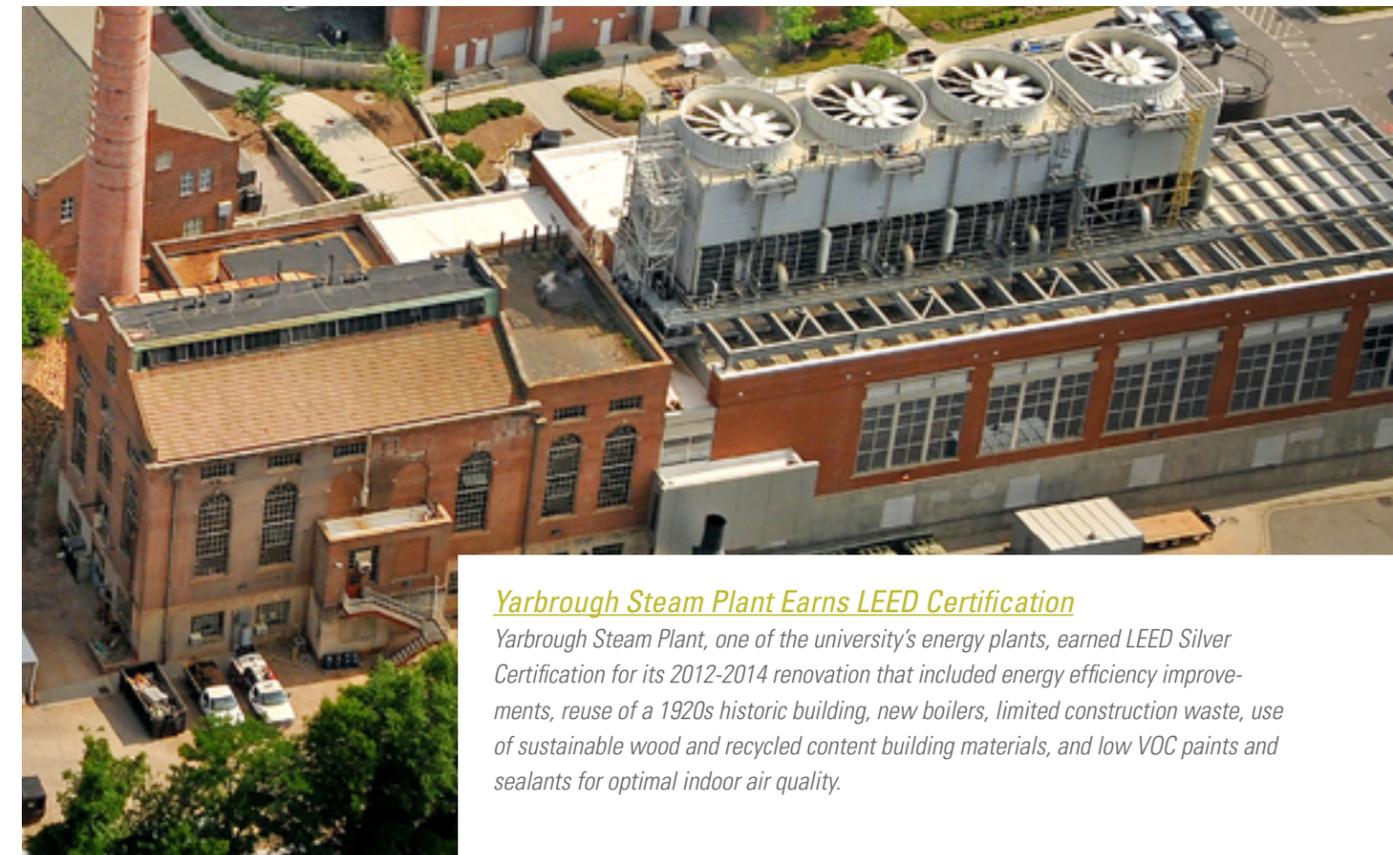
**TACTIC:** Select third party consultant group that will guide universal fleet policies.

**PROGRESS:** A consultant was selected and their recommendations have been forwarded to university administration for consideration.

# 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.



### *Yarbrough Steam Plant Earns LEED Certification*

*Yarbrough Steam Plant, one of the university's energy plants, earned LEED Silver Certification for its 2012-2014 renovation that included energy efficiency improvements, reuse of a 1920s historic building, new boilers, limited construction waste, use of sustainable wood and recycled content building materials, and low VOC paints and sealants for optimal indoor air quality.*

# 2013-2014 HIGHLIGHTS



## WOLF RIDGE STUDENT APARTMENTS OPEN

This new University Housing apartment complex will be certified LEED Silver – the first LEED-certified residence hall at the university – for sustainability and contains dining facilities, a bookstore and a fitness center. Two of the complex's buildings began housing about 400 students in August 2013 and the other four buildings opened for fall semester 2014, bringing capacity to about 1,200 graduate and upper-division students. Among the complex's sustainability features are a green roof, rainwater collection cistern, low VOC paints and sealants and 4,182 energy-efficient LED lights.

## SUSTAINABILITY INTEGRATED IN SMALLER CONSTRUCTION, RENOVATION PROJECTS

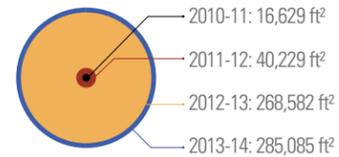
Going beyond its commitment to LEED Silver certification for new construction projects that are more than 20,000 square feet, NC State developed sustainability guidelines for smaller construction or renovation projects. Since the sustainability standards checklist was implemented in 2013, more than 200 campus projects – ranging from major equipment installations to classroom renovations – have intentionally incorporated sustainability.



## Campus-Made Mulch Cuts Costs, Improves Sustainability

A spring 2014 pilot project between NC State Grounds Management and Horticulture Field Labs covered 15 percent of campus landscape areas with a new type of mulch blended from campus landscape debris and wood chips. In addition to being half the cost, the mulch reduces emissions associated with long-distance delivery, has no chemical additives and initiates a closed loop system in which organic material stays on campus for continued use.

## LEED CERTIFIED SPACE ON CAMPUS

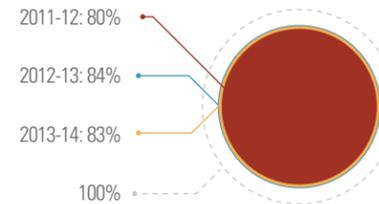


## LEED CERTIFIED AND REGISTERED BUILDINGS



*Prior reports tracked the percentage of undergraduate students living on campus. With no additional campus housing in development, student residential capacity remains constant and this metric will no longer be tracked as a measurement of progress.*

## PERCENTAGE OF WALKABLE BUILDINGS ON CAMPUS



## SOFTWARE DRIVES ONGOING SPACE MANAGEMENT EFFORTS

Efficient utilization of space in existing campus buildings reduces the need to construct new campus buildings. With the help of new space management software that was implemented on campus in December 2013, NC State can track how campus buildings are utilized. Beginning in fall 2014, office and research lab space will be linked with specific users of that space, revealing underutilized space that could be repurposed for another campus use.

## PLAN DEVELOPED FOR CAMPUS SMART GRID

A collaborative effort of researchers, faculty, campus facilities and industry have resulted in a 2014 NC State Smart Grid Master Plan, which will modernize the campus grid, create research opportunities, stimulate economic development and create a more resilient campus in the decades to come. A group of senior engineering students also contributed to the master plan, collecting data on campus electric grid operations and suggesting future resiliency and renewable energy opportunities.



## ARTIST'S BACKYARD COMPLETES FOURTH PHASE

NC State landscape architecture graduate students completed a \$20,000 landscape overhaul in between Owen and Turlington residence halls, where students now have access to a new patio, rain garden and boulder wall made from material recycled during construction of Talley Student Union and Wolf Plaza. The project marked five years of partnership between University Housing and the Design + Build program, which provides students with hands-on experience in designing and constructing environmentally progressive landscapes.



## Natural Areas, Invasive Plant Removal Advanced at Centennial Campus

In addition to updating the Centennial Campus Tree Conservation Plan, the university also reforested a natural area south of the new Wolf Ridge student apartments as part of the construction project. At nearby Lake Raleigh, a student developed an invasive plant identification guide that will help future efforts to eradicate invasive plants.



## 2013-2014 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:** Complete Physical Master Plan task force work and integrate recommendations into the university's 2014 Physical Master Plan.

**PROGRESS:** Complete.

**TACTIC:** Publish the university's 2014 Physical Master Plan.

**PROGRESS:** Scheduled for publication in September 2014.

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

**TACTIC:** Implement the LEED Checklist, Sustainability Checklist or Sustainability Standards on all projects.

**PROGRESS:** At the initial design meeting with the customer, NC State project managers and designers discuss sustainability initiatives and brainstorm ideas for each project. For example, Capital Project Management is undertaking a pilot project to integrate the Sustainability Checklist on the Carmichael Gym locker room upgrades project since this project does not meet the requirements of the university's LEED mandate.

**TACTIC:** Add sustainability as a criteria to contractor selection process.

**PROGRESS:** Informal projects now include sustainability criteria for general contractor prequalification. Developing a process for formal projects not requiring prequalification will be a tactic for fiscal year 2014-2015.

**TACTIC:** Add sustainability to all Designer Selection Factors, Open Ended Service Agreement Designer and Interview Selection Processes.

**PROGRESS:** Experience with LEED projects or sustainability is now an optional criteria on the project summary and designer briefing sheet as well as the construction contractor evaluation form for informal projects.

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

**TACTIC:** Review NC State's Construction Guidelines relative to small (non-LEED) projects to ensure sustainability content.

**PROGRESS:** Sustainability guidelines have been drafted and are in review. This will be completed in fiscal year 2014-2015.

**TACTIC:** Research the option of developing small project specifications and standard details located on standard drawing sheets.

**PROGRESS:** Meetings are scheduled for fall 2014. This tactic will be forwarded to fiscal year 2014-2015.

**TACTIC:** Research the possibility of construction projects that include sustainability in both ground and operational lease agreements.

**PROGRESS:** Centennial Campus Development Office is working to integrate sustainability guidelines and requirements into ground and operational leases.

**TACTIC:** Research benefits of clean construction methods to projects.

**PROGRESS:** Priorities have shifted, and this tactic will not be pursued.

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

**TACTIC:** Provide opportunities for project managers to attend seminars to increase awareness of sustainable tactics for small projects.

**PROGRESS:** An in-house training session is scheduled for fall 2014 for Design and Construction Services staff.

**TACTIC:** Research and disseminate the benefits of LEED investment at NC State to campus customers.

**PROGRESS:** Research was conducted and the summary document has been written in preparation for future release.

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

**TACTIC:** Pilot a holistic renovation in Ricks Hall.

**PROGRESS:** Ricks Hall renovation was consolidated into a holistic project managed by Capital Project Management. A holistic HVAC approach was a success, but funding lagged to complete the entire project. This approach will be used on future partial renovations.

**TACTIC:** Identify projects to integrate with the campus Bike and Pedestrian Master Plan.

**PROGRESS:** A priority bike and pedestrian project list was developed and funding will be sought (see tactics in Transportation section for details).

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

**TACTIC:** Research building products that provide transparency regarding material content, manufacturing processes, etc.

**PROGRESS:** A student project investigated material manufacturing verification but vendor information was lacking, so this tactic will be tabled.

**TACTIC:** Make sustainability an integral part of the Facility Modification Request and Work Order process.

**PROGRESS:** Repair and Renovation has developed sustainability standards that are in review. Design and Construction Services uses a Sustainability Checklist.

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

**TACTIC:** Implement new space management software to track space assignments and utilization, vetting it against space standards to identify where improvements can be made.

**PROGRESS:** FM Systems software was implemented in December 2013 and 15 software training sessions were held on campus in spring 2014.

**TACTIC:** Implement Strategic Space Reserve initiative to locate underutilized/vacant academic space that could be more efficiently repurposed to accommodate Chancellor's Faculty Excellence Program hires.

**PROGRESS:** In January 2014, the University Space Committee reviewed progress of the initiative, which has been implemented and used for

some new hires. Use will continue.

**TACTIC:** Revise Space Principles to: a). Schedule all 110 or general use classrooms through Registration and Records to increase utilization. b). Limit faculty to one office each. c). Provide workspace hoteling for extension, field faculty and staff that are on campus part-time and for graduate students. d). Provide shared office space, when available, for emeriti faculty. e). Give preference to requests that share resources. f). Store items not needing regular access off campus.

**PROGRESS:** Implementation of many of these principles have started and efforts will be ongoing, particularly as other tracking and measurement efforts are launched.

**TACTIC:** Track strategic space reserve square footage to show cost savings and other benefits of not building new facilities.

**PROGRESS:** This tactic will be forwarded to fiscal year 2014-2015.

**TACTIC:** Begin project to tag people to office space.

**PROGRESS:** Conducted a pilot in Administrative Services III Building. The next phase of incremental roll out starts in August 2014.

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

**TACTIC:** Update the Landscape Implementation Plan.

**PROGRESS:** 2014 Physical Master Plan updates must be implemented first, so this tactic was moved to fiscal year 2015-2016.

**TACTIC:** Develop a bike and pedestrian sequencing plan for the next three years and document completed projects (see tactics in Transportation section for more details).

**PROGRESS:** NC State Transportation developed a project tracking tool that will allow for future sequencing of projects.

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

**TACTIC:** Design northern part of North Creek multipurpose trail.

**PROGRESS:** Funding is unavailable at this time. The project will be sequenced in the campus Bike and Pedestrian Master Plan and may also be added to the Centennial Campus sequencing plan.

**TACTIC:** Identify location for additional recreational sports fields on Centennial Campus.

**PROGRESS:** Potential locations were identified but cannot be finalized because of ongoing, long-term master planning efforts.

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

**TACTIC:** Complete construction of Wolf Ridge Apartments, which are on-campus student housing.

**PROGRESS:** All six Wolf Ridge apartment buildings opened in August 2014 with capacity to house 1,200 students.

**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:** Develop a priority project list for creating a regional stormwater plan and budget.

**PROGRESS:** The first priority is creating a North Campus stormwater plan, including Dan Allen drainage area and stormwater inventory of the eastern portion of North Campus. Centennial Campus stormwater mapping is 75 percent complete.

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

**PROGRESS:** Leadership for this group has not yet been identified. The tactic will be forward to 2014-2015.

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

**TACTIC:** Reforest natural areas south of Wolf Ridge Apartments.

**PROGRESS:** Complete.

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

**TACTIC:** Submit Greek Village Conservation Plan to City of Raleigh.

**PROGRESS:** In progress but not yet complete due to other priorities and staff limitations.

**TACTIC:** Update the Centennial Campus Tree Conservation Plan.

**PROGRESS:** The plan was updated in December 2013, reviewed by the City of Raleigh and is awaiting final updates from the consultant.

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

**TACTIC:** Reconvene the committee responsible for developing the plan.

**PROGRESS:** The committee reconvened with two new chairs: the university's landscape architect and a forestry professor.

**TACTIC:** Initiate study to remove invasive plants as part of student multi-semester project.

**PROGRESS:** This tactic was transferred from fiscal year 2012-2013. The full study was not pursued because the Lake Raleigh Management Plan was a greater priority, but a student developed an invasive plant identification guide for Lake Raleigh.

**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:** Ensure green cleaning and pest management is mandated in campus contracts.

**PROGRESS:** Language regarding standards for "green cleaning" is included in all University Housekeeping activities including any contracts overseen by the department.

# EVENTS, AWARDS & HONORS



**THE CAMPUS ENVIRONMENTAL SUSTAINABILITY TEAM'S 2014 GREEN BRICK AWARDS** recognized outstanding campus sustainability contributions from student Matt Abele, staff member Keith Smith, faculty member Scott Showalter, and the Alumni Association Student Ambassador Program.



**THE UTILITY SAVINGS AWARD OF EXCELLENCE** from the Utility Savings Initiative of the North Carolina Department of Environment and Natural Resources was awarded to the university, recognizing its progress and leadership in campus energy efficiency.

**UNIVERSITY DINING RECEIVED A BRONZE MEDAL** in National Association of College and University Food Services Sustainability Awards' outreach and education category for its "My Roots Are At NC State" program.



**GOLD STATUS AWARDED TO NC STATE'S CHAPTER OF NET IMPACT**, a national network of 300+ chapters working toward a sustainable future. NC State's graduate student chapter, based out of the Poole College of Management, is now part of an elite 16 percent of chapters honored with this status.



**THE PRINCETON REVIEW** named NC State in its annual [Guide to 322 Green Colleges](#), which identifies the nation's most environmentally friendly universities. It also recognized the university in its [Top 10 Best Value Public Colleges for 2014](#) at fourth place.



**THE 2013 SIR WALTER RALEIGH AWARDS** recognized a new garden outside of Polk Hall for its student-designed heat mitigation system that enables plants to grow despite underground steam pipes.



**2014 CITY OF RALEIGH ENVIRONMENTAL AWARDS** received by the NC State community: professor Dr. Bob Patterson, Environmental Awareness Award; student Caroline Hansley, Youth Award; NC Solar Center at NC State, Regional Award.

## SUSTAINABILITY-RELATED CAMPUS EVENTS DURING FISCAL YEAR 2013-2014:

### 2013

Watch Your Waste Dining Hall Food Waste Audits, Sept. 3-4  
All Carolinas Meal, Sept. 12  
Local Sustainable NC State Men's Soccer Game, Sept. 14  
Under & Over Nutrition: Exploring the Global Epidemic, Sept. 16  
Lecture: Richard Holcomb on Sustainable Agriculture, Sept. 17  
Wolfine Rider Appreciation Day, Sept. 19  
Gorman Street Clean Up, Sept. 29  
Alternative Vehicle Showcase and Campus Sustainability Day, Oct. 2

Sustainability Speaker Series: Sustainable Productivity, Oct. 14  
NC Solar Center 25th Anniversary, Oct. 14  
Death by Dust? The Curious Case of the Disappearing Bee, Oct. 15  
Visions of Environmental Health Science in the 21st Century, Oct. 17  
Film Screening: *Chasing Ice*, Oct. 23  
Vermiculture Conference, Oct. 26-27  
Urbanizing Ecologies: Design Systems for Making "La Cite," Oct. 28  
Informing Conservation of a Biological Treasure Close to Home, Nov. 4

Applied Sustainability: A Real World Workshop, Nov. 6  
Wells Fargo Lecture Series: Sustainability & Your Career, Nov. 6  
Global Issues Seminar: Food versus Fuel, Nov. 11  
Dumpster Diving: A Presentation by Dr. Bridget Lassiter, Nov. 12  
America Recycles Day, Nov. 13  
Innovating through Environmental Sustainability, Nov. 13  
Net Impact: Sustainability + Careers, Dec. 5

### 2014

Understanding and Communicating Climate Science, Jan. 15  
Southeast Climate Science Center Grand Opening, Jan. 22  
Film Screening: *Shored Up*, Feb. 5  
Cycle for Survival, Feb. 15  
Poole College Sustainability Curriculum/Research Seminars, Feb. 19-20  
Energy-Saving Seminar, Feb. 21  
Ocean Mud, Ceramic Change and Our Connecting Minds, Feb. 23  
Water Week, Feb. 24-28  
Love Your Genes, Feb. 25  
Jean Swap, Feb. 27  
Lecture: Having Fun with Food: A Brief History of Eating, March 5  
Recycling and Paper Shredding Drive, March 12  
Seminar on Fuels from Renewable and Alternative Sources, March 17  
Arbor Day, March 22  
Seeding Food Studies Workshop, March 24  
Film Screening: *Trashed*, March 24

Smarter Buildings: Development, Deployment & Demonstration, March 25  
Future of Food Series, March 25  
College of Veterinary Medicine Open House, March 29  
Rubbage Ride, March 29  
NC State Earth Month, April 1-30  
Tri-Towers Energy and Water Challenge, April 1-28  
NC State Commute Challenge, April 1 - May 31  
More Than Money Sustainability Careers Workshops, April 1  
Net Impact Lunch and Learn, April 2  
Research Seminar with Stanford University's Joshua Rauh, April 2  
State of the Sciences with Neil deGrasse Tyson, April 3  
Global Environmental Change Lecture: Power to Save Nature?, April 8  
Cates Utility Plant Tour, April 8 and 29  
Pack 30 Hour Famine, April 8  
Food for Thought: A Compelling Conversation, April 8  
Earth Fair, April 9

If Your Clothes Could Talk, April 9  
Global Engagement Exposition, April 10  
The History of the Universe from Beginning to End, April 10  
Film: Screening of *Semper Fi*, April 11  
Zero-Waste Kay Yow Spring Game, April 12  
Live & Local on Hillsborough Street, April 12  
College of Sciences Seminar: Iain Couzin, April 14  
Farm Feast and the Green Brick Awards, April 14  
Salsa Up: Change Your State of Wellness, April 14  
Net Impact Lunch and Learn, April 23  
Earth Day Stressbuster, April 23  
Sustainability in Management Research Seminar, April 23  
Free Screening of *Who Cares*, April 24  
Pack N Give, April 25 - May 11  
Medication Drop Off and Collection Drive, April 26

## CERTIFIED WOLFPACK SUSTAINABLE EVENTS

CAMPUS EVENTS THAT ACHIEVED CERTIFICATION AT THE FOLLOWING LEVELS:

### CHAMPION

NC State Homecoming, Oct. 27 - Nov. 2, 2013  
Krispy Kreme Challenge, Feb. 8, 2014  
Center for Environmental Farming Systems Receptions, Feb. 12 and March 18, 2014  
Earth Fair, April 9, 2014

### STEWARDS

Alternative Vehicle Showcase, Oct. 2, 2013  
Campout, Oct. 18, 2013  
Environmental Sciences Fall Potluck Social, Sept. 17, 2013  
Repair & Renovation Services Quarterly Luncheon, Oct. 25, 2013 and May 2, 2014  
NC Exports Wood Conference, Nov. 13-15, 2013  
NC State Facilities Division Recognition Luncheon, Dec. 13, 2013  
Center for Environmental Farming Systems Board Meeting, Feb. 11, 2014  
College of Veterinary Medicine Open House, March 29, 2014  
Earth Day Stressbuster, April 23, 2014

### CONTRIBUTOR

Latinos Beyond the Reel Movie and Discussion Panel, Sept. 18, 2013  
Facilities Division Building Liaison Briefings, Oct. 28 and 30, 2013  
Community Forest Stewardship Workshop, April 2, 2014  
West Campus End of Year Picnic, April 23, 2014



# ACKNOWLEDGEMENTS

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

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