



NC STATE
UNIVERSITY



Sustainability Report

FISCAL YEAR 2022



The **2022 NC State Sustainability Report** highlights the latest progress toward the university's sustainability goals and its commitment to wise stewardship of resources, prudent financial planning and environmentally responsible operations.

In this report, you will learn about new and existing sustainability programs, projects and practices from July 1, 2021 through June 30, 2022. These initiatives contribute to a more efficient and resilient campus, foster important research breakthroughs and equip students to address the grand challenges facing our society, economy and environment.

Both on and off campus, NC State is building sustainability awareness, partnerships and solutions that contribute to a healthy environment, a growing economy and thriving communities.

THIS YEAR'S AWARDS, HONORS AND RECOGNITION

#18 Green College

in the Princeton Review's 2022 "Top Green Colleges" list



Top 200 Globally

for sustainability impact in the Times Higher Education 2022 Impact Ranking. NC State also ranked:

- No. 7 among U.S. universities
- No. 4 in the U.S. and No. 26 (tied) in the world for impact in Life Below Water
- No. 5 in the U.S. and No. 50 in the world for impact in Clean Water and Sanitation
- No. 9 in the U.S. and top 200 globally for impact in Industry, Innovation and Infrastructure

NC State's efforts to address food and housing insecurity were recognized with a national **Campus Sustainability Achievement Award** from the Association for the Advancement of Sustainability in Higher Education (AASHE)

Waste diversion efforts at Carter-Finley Stadium won the **2021 Gameday Recycling Challenge Award** for Waste Minimization Per Capita

Academics

Goal: Integrate sustainability into education, experiences and research.



New Center For Phosphorus Sustainability

The Science and Technologies for Phosphorus Sustainability (STEPS) Center opened in September 2021 on Centennial Campus. Funded by the National Science Foundation, it is a joint effort between NC State and eight partner institutions to produce effective solutions for food systems and environmental quality.

775+

NC State **undergraduate and graduate courses** feature content that relates to at least one of the global Sustainable Development Goals.

29

students, faculty, staff and recent graduates from the College of Veterinary Medicine traveled to the **Galapagos Islands** to study sea lions, sharks and stingrays.

474

first-year and transfer students completed the **Wicked Problems, Wolfpack Solutions** summer 2021 course on Global Change.

11

graduate students focused on interdisciplinary global change research were selected for the **Global Change Fellows** program.

83

students took part in the **Environmental Sciences Capstone Course** tackling challenges including sea level rise along the N.C. coast to the impact of Covid-19 on women in forestry.

9

faculty members joined the inaugural cohort of the **Global Engagement Institute Fellows**, which uses the Sustainable Development Goals as a framework for collaboration.



Reducing Plastic and Water Pollution

College of Natural Resources researchers developed a new biodegradable material from leftover sawdust and agro-residues to replace single-use plastics, saving environmental resources and addressing plastic pollution.

Researchers also work with the Wilson College of Textiles to extract cellulose from wood chips to print iridescent designs on clothing, reducing the need for dyes and other toxic coloration agents that pollute water systems.

Moving From “Think” to “Do”

Faculty and staff members connected the global **Sustainable Development Goals** to campus operations, instruction, research and co-curricular student activities in an article published by the *United Nations Chronicle*. The United Nations' Academic Impact group also invited co-author Dr. Seth Murray to present NC State's work at an international workshop in January 2022.



Smarter, Healthier Transportation Systems

College of Engineering faculty are guiding students to develop transportation systems that support a community's physical, mental and sustainable well-being.



Tools To Boost Sustainability

New tools developed by NC State researchers include:

- Model that determines best sites for electric vehicle charging stations
- Tool that helps solid waste systems efficiently achieve their environmental goals
- Ethical Apparel Index that identifies unethical working conditions in apparel supply chains

ADDITIONAL RESEARCH HIGHLIGHTS:

College of Agriculture and Life Sciences researchers explore the use of paper-based electrodes to sanitize produce, eliminating the need for packaging in grocery stores and water to wash produce at home.

College of Design students use drones with thermal cameras to identify ways landscapes and design can mitigate the negative impacts of urban heat islands.

College of Education researchers examined environmental teacher training programs abroad, finding that teachers influence the sustainability practices of students and their families.

College of Engineering researchers developed a cost-effective and environmentally-friendly strategy to boost efficiency of large-scale perovskite solar cells.

College of Humanities and Social Sciences research suggests that U.S. electric utility climate pledges have the potential to collectively reduce power sector emissions by one-third.

College of Natural Resources established the Sustainable and Alternative Fibers Initiatives to study, develop and promote alternative fibers for packaging, hygiene, textiles and other products.

College of Sciences researchers examine the connection between environmental contaminants and liver health in diverse populations.

College of Veterinary Medicine plays a key role to preserve and repopulate red wolves by providing medical care and research.

Student Leadership

Goal: Engage students in initiatives that promote leadership and service in sustainability.



Students Add Campus Garden

Tucked behind Carmichael Gym along Rocky Branch Trail is a new garden planted by the Sustainability Stewards with assistance from Grounds Services and the NC State Sustainability Fund. The site features native, pollinator-friendly and edible vegetation.

Pack of Ideas

A Poole College of Management student team placed seventh in an international competition, Ideathon Experience. The students designed a solution focused on ecology and climate change using electricity generating stationary bicycles located in gyms, houses and schools that not only powered the building but would also feed into the electrical grid.

10 students were selected as part of an inaugural cohort of the **Climate Leaders Program**, which is led by the Kenan Institute for Engineering, Technology & Science (KIETS) and focuses on climate change solutions.

30 students were selected for the **Social Innovation Fellows** program, which explores the intersection of ethics, sustainability and innovation.

2 community gardens were built with \$3,600 raised by the **Park Scholars** Class of 2022 at child care centers that serve under-resourced families.



Sustainable Student Innovation

72 students in 21 teams spent January 27-30, 2022 competing to design and prototype sustainability solutions as part of NC State **Make-A-Thon**. The winning team designed an Arduino device that can turn off lights in residence hall rooms using an audible prompt.

New Sustainability Internship Program

The University Sustainability Office launched the **Campus As A Classroom** internship program as a new professional development program that advances campus sustainability. 11 undergraduate students participated in the program's pilot year, working on a variety of projects.



Sustainable By Design

College of Design students worked alongside industry partner Eastman to create food packaging with a new compostable material.



Education About Campus Waste

NC State Student Government approved a Social Innovations Fellows bill to require waste sorting training for incoming students.



Compost Carnival

Over 150 students attended a Compost Carnival, hosted by the Student Government Sustainability Department in October 2021, which combined games, compost pail giveaways and educational outreach by sustainable student organizations.



Education About Reuse

Students in the Sustainability Stewards hosted a **Campus Thrift Store** in March 2022 to reduce textile waste and spread awareness about the opportunity to reuse.

30 students were part of the **Sustainability Stewards** leadership program, which hosted 13 education events and received grant funding to create a green terrace at Talley Student Union.

112 students participated in **Mystery Service Saturdays** to engage and provide direct service for the local community.

25 students participated in an NC State and USDA **Ag Tech Hackathon** to accelerate agricultural sustainability using machine learning and robotics.

64 students participated in **Alternative Service Break** opportunities hosted by Student Leadership and Engagement focusing on water quality, sanitation, affordable housing and other issues.

Energy Week Pitch Contest

The winning student solution in the NC State **Energy Week Pitch Contest** was a solar-powered pavilion at On The Oval to boost awareness and use of alternative energy on campus.

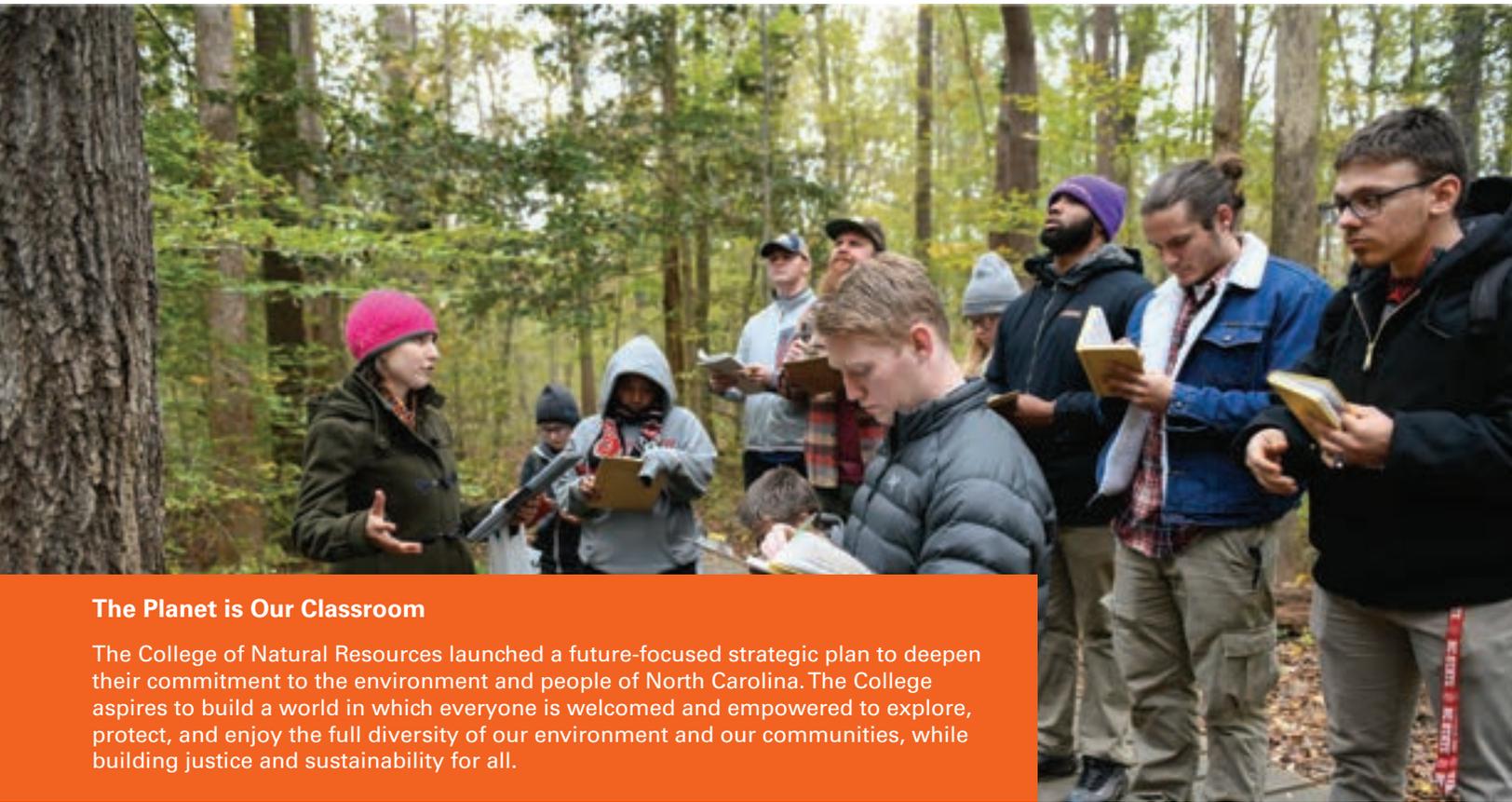


Ocean Advocacy Workshop

More than 120 students across the UNC System learned how to champion oceans and the environment through this first-of-its-kind event co-hosted by the College of Natural Resources with support from the NC State Sustainability Fund.

Community and Culture

Goal: Accelerate a culture of sustainability, inclusivity and well-being on campus and in the community.



The Planet is Our Classroom

The College of Natural Resources launched a future-focused strategic plan to deepen their commitment to the environment and people of North Carolina. The College aspires to build a world in which everyone is welcomed and empowered to explore, protect, and enjoy the full diversity of our environment and our communities, while building justice and sustainability for all.

Sustainable Wolfpack

NC State Athletics hired its first sustainability intern to implement sustainability-themed games across sports and develop ideas to promote more sustainable operations.

Flourishing Pack

Prevention Services and Horticulture Science offered Flourish drop-in spaces for students to engage in horticulture therapy, learning how to propagate plants and grow food at home.

Advancing Climate Resiliency

NC State researchers were awarded a five-year, \$5 million grant from the National Oceanic and Atmospheric Administration (NOAA) to lead a multi-institutional effort on developing climate resilience solutions in the Carolinas.

Exploring Equity

NC State's Inaugural Equity Research Symposium included discussions on environmental justice, equitable community-university partnerships and the dynamics of social activism.

Sustainability Fund Grants Awarded

The NC State Sustainability Fund awarded \$176,000 in grants to these 13 projects:

- An outdoor terrace garden at Talley Student Union
- Inaugural climate leaders symposium on campus
- Installation of water bottle refilling stations in the Wilson College of Textiles
- Creation and distribution of education magnets for students about campus recycling and composting
- Addition of edible plants and other infrastructure at the student-led SOL Garden
- Student internships at the NC State Agroecology Education Farm
- A project to grow perennial plants for use in campus landscapes
- A research project at the campus Compost Facility and Research Cooperative to monitor microbial composition of compost and create educational and engagement activities for students
- A hydroponics system at Interfaith Food Shuttle, which donates produce to the Feed the Pack Food Pantry and other community organizations
- Transition of gameday scripts and information from print to a new digital-only process for NC State Athletics
- Enhancement of an educational orchard at the NC State Agroecology Education Farm.
- Development of a landscape plan to preserve a campus habitat for ground-nesting bees
- Construction of hiking trails at Lake Raleigh Woods

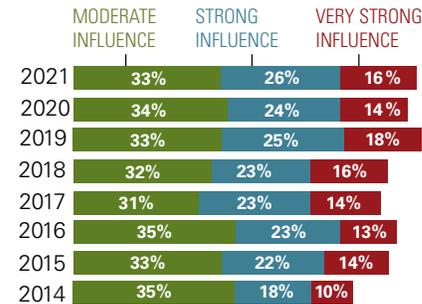
29 university events and student organizations earned NC State **Sustainability Certification** during fiscal year 2022 in recognition of sustainability actions and impact.

NC State Sustainability Award Winners

The NC State 2022 Sustainability Award winners are:

- Ann Winstead (student category)
- Dr. Carol Seals Price (faculty category)
- Dennis Kinsler (staff category)
- Center for Environmental Farming Systems Business and Events Team (department/organization category)
- Facilities Division Commissioning Team (innovation/impact category)

75% of incoming students in 2021 indicated NC State's commitment to the environment and sustainability influenced their decision to attend NC State.



125,405

pounds of food was distributed by Feed the Pack Food Pantry on campus.

\$1,361,000

was raised in support of the Student Emergency Fund and Endowment, Meal and Housing Scholarships and Feed the Pack Food Pantry.

3,435

campus dining meals were donated by students to provide free meals to students facing food insecurity.

EDUCATION AND OUTREACH

The **B Corp Clinic** worked with 16 global companies, engaging 62 Poole College of Management graduate students on practicum projects to improve the companies' social and environmental impact.

The **NC Clean Energy Technology Center** at NC State hosted 90 events, workshops and presentations while also providing 26 facility energy assessments that could potentially save \$6.7 million in energy costs.

The College of Natural Resources and a hospitality firm launched the **Lighthouse Fund for Sustainable Tourism** to support research and outreach activities across the Outer Banks.

The Business Sustainability Collaborative at Poole College of Management hosted a **Speed Networking with Change Makers** event for students to meet and learn from Triangle community leaders who use business as a force for good.

NC State Staff Senate's Resources and Environment Committee continued its **Sustainability Partners** event series to advance sustainability knowledge and practices on campus and beyond. Events focused on transportation, energy savings, waste reduction, gardening, local food and pollinators.

Operations, Planning and Design

Goal: Model sustainability through efficient, innovative facilities and operations that educate the campus community and improve the quality of life.

Built With Sustainability In Mind

The NC State Plant Sciences Building opened in April 2022 as the global home for plant science innovation related to agricultural global challenges. The building is expected to achieve LEED certification for Leadership in Energy and Environmental Design.



\$2.7 million

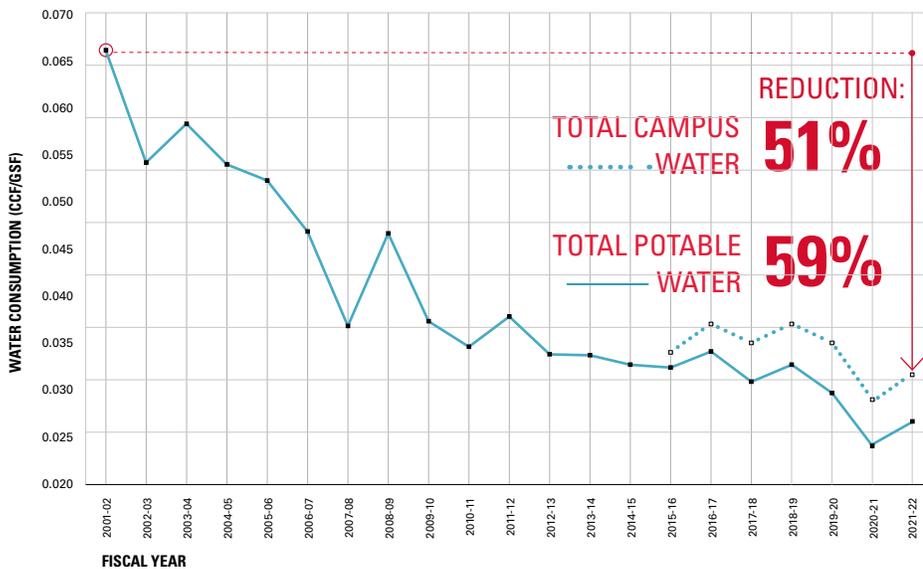
in campus utility costs avoided by the Building Maintenance and Operations Commissioning Team through mechanical calibrations to improve HVAC system efficiency.

CAMPUS ENERGY USE PER GROSS SQUARE FOOT

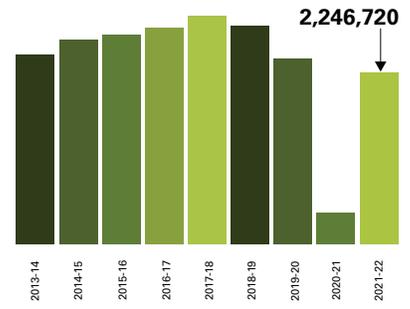


*While campus occupancy was reduced during the pandemic, NC State implemented energy-intensive Covid-19 mitigation measures such as increased air filtration and outdoor air levels and increased hours of operation to allow flushing of air before and after building occupation for safety.

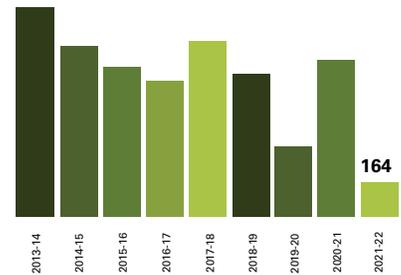
CAMPUS WATER USE PER GROSS SQUARE FOOT



WOLFLINE BUS PASSENGER BOARDINGS



PARTICIPANTS IN WOLFTRAILS ALTERNATIVE COMMUTER PROGRAM



357 new bicycle registrations on campus

1,000 pounds of paper was avoided by NC State Transportation by transitioning to digital brochures and reports

Lighting Projects Boost Efficiency

LED fixtures installed in the College of Agriculture and Life Sciences greenhouses off of Method Road are expected to save nearly \$130,000 in annual electric utility costs. New energy-efficient LED lighting was also installed throughout the central utility plants on Centennial Biomedical Campus, Centennial Campus and the third floor of Polk Hall.



Physical Master Plan

Stewardship of campus resources is one of the guiding principles in the collaborative effort to create NC State's next Physical Master Plan, which will be completed in 2023.

Holiday Energy Savings Initiative

Buildings across NC State avoided \$416,000 in energy costs over the university's winter break. The savings initiative began in 2005 and has saved over \$5 million in energy costs.

15,000

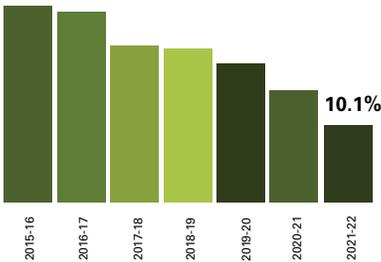
pounds of produce grown at the NC State Agroecology Education Farm was used by NC State Dining.



Microbial Research

Two students worked with faculty member Dr. Carlos Goller to study the microbial composition of compost created at NC State's Compost Facility and Research Cooperative with the aim of identifying process improvements.

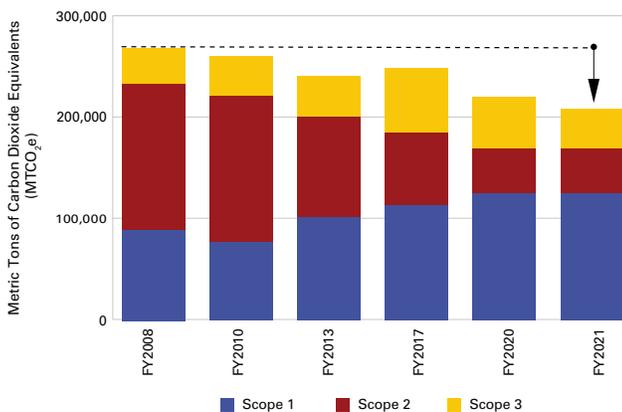
LOCAL FOOD PURCHASED BY NC STATE DINING



Service Raleigh

Students sorted 24 hours of landfill waste collected from Talley Student Union in April 2022. The results identified landfill-bound items that could have otherwise been reused, recycled or composted. The data provides campus partners a more targeted approach for diversion efforts.

CAMPUS GREENHOUSE GAS EMISSIONS



24.5% REDUCTION FROM 2008 TO 2021



New Campus Emissions Dashboard

NC State is working to reduce emissions associated with university operations and launched an interactive online dashboard that displays results of campus greenhouse gas inventories.



Growing Sustainably

20% of the annual flowers and plants installed on campus in spring 2022 were grown on campus by Grounds Services, which received an NC State Sustainability Fund grant for a greenhouse.



Stormwater Pond Renewal

A stormwater pond was updated using natural elements to control the quantity and quality of stormwater runoff from nearby parking lots before it reaches Rocky Branch Creek.



Forging New Paths

New signage and development of hiking and biking trails are in progress at Lake Raleigh Woods with a grant from the NC State Sustainability Fund.



A Space to Explore Solar

A new outdoor hub for students to study, socialize and charge their electronics was installed by the Sustainability Stewards with a grant from the NC State Sustainability Fund.

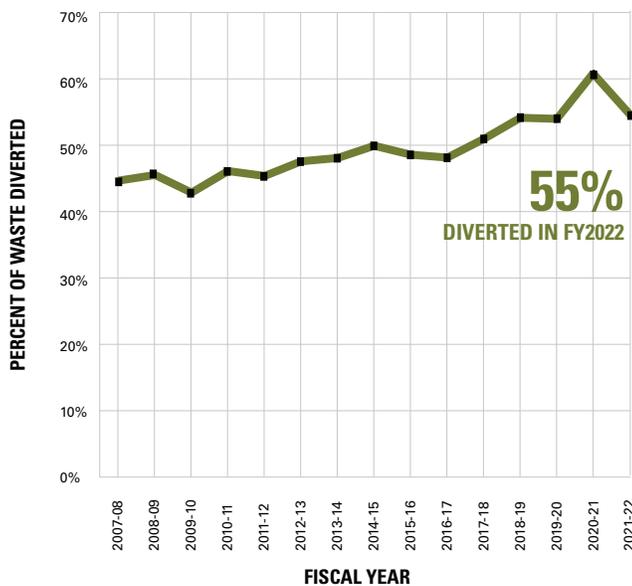
240

compost pails were installed in University Housing campus apartments.

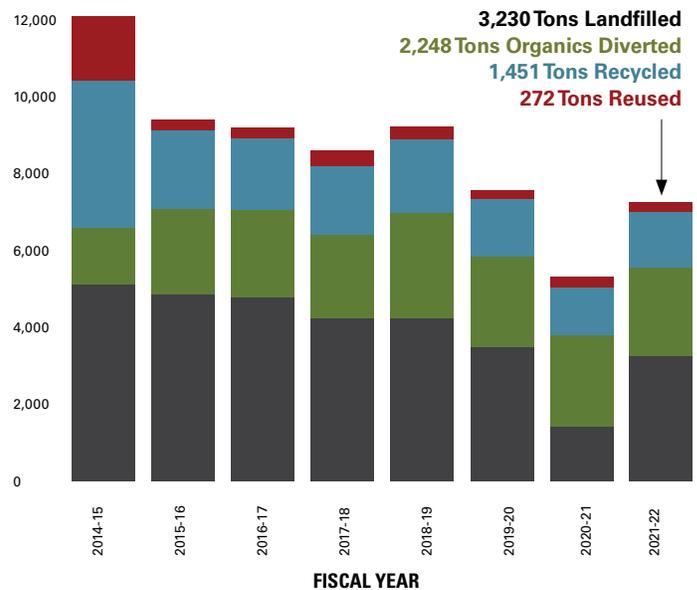
224

Zero Waste Wolfpack volunteers helped fans divert 53,826 lbs of recyclables and compostables at Carter-Finley Stadium during home football games.

CAMPUS WASTE DIVERTED FROM LANDFILL



TONS OF CAMPUS MATERIAL



209,212

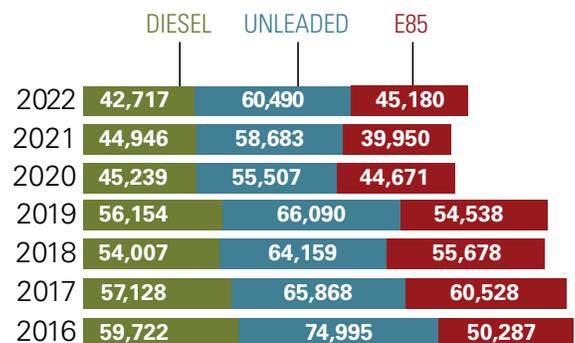
pounds of unwanted e-waste recovered, repurposed and recycled by NC State Surplus Property Services.

35,130

pounds of clothing, housewares, toiletries and food was collected during campus move-out in May 2022. These student donations were given to NC State Feed the Pack Food Pantry and local community nonprofits.

FUEL TYPE USED IN FACILITIES DIVISION*

*The Facilities Division, which includes Motor Pool, is one of NC State's largest vehicle fleets



Communications

Goal: Propel awareness and sustainability at NC State and beyond.

137,495

pageviews on sustainability.ncsu.edu.

10,115

followers on NC State's sustainability social media accounts.

1,664

incoming students requested information about campus sustainability.

Football Fan Engagement

Parks, Recreation and Tourism Management faculty collaborated with DELTA and NC State Waste Reduction and Recycling to create a series of videos and a digital game to promote zero waste at football games. The materials were used as part of classroom curriculum and as in-game video messages to fans at Carter-Finley Stadium.



Sustainability Events Abound

NC State celebrated its second annual **Energy Week** in September 2021 to increase visibility of the university's energy use, research and opportunity to shape a clean energy future.

52 events were part of NC State **Earth Month** in April 2022.

NC State **Global Entrepreneurship Week** celebrated startups that bring ideas to life, drive economic growth and expand human welfare.

The Wilson College of Textiles hosted the first annual **Evolving Textiles Conference** focused on circularity, alternative fibers, and the challenges and opportunities of a sustainable textile industry.

University Libraries sponsored a series of online and in-person **Global Change Games** to help students understand how climate change affects people, wildlife and civilization.

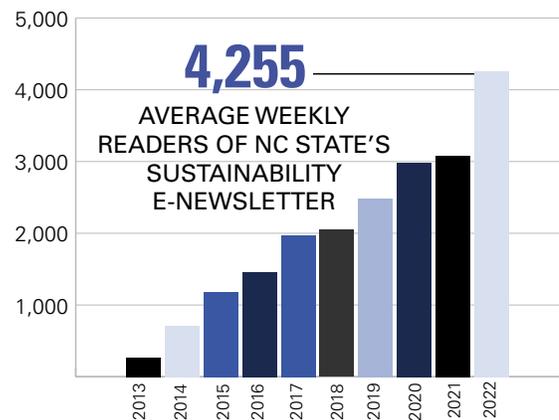
Active Citizenry Workshop Series taught students about governmental systems and how to create purposeful change in their communities. Sponsored by Student Leadership and Engagement, workshops included discussions on climate action, policy and social change.



74 sustainability-related offerings hosted by the **Osher Lifelong Learning Institute (OLLI)** at NC State which provides non-credit courses, study trips and events for adults aged 50+.

234 sustainability-related events on campus – an 80% increase from 2021.

231 new campus employees completed a **campus sustainability online course** as part of a revamped onboarding process for staff and faculty.



Education About The SDGs

The Office of Global Engagement launched a two-year programming initiative focusing on the global Sustainable Development Goals. Also, NC State offered **SDG Action and Awareness Week** in March 2022 to increase visibility of research, engagement and projects connected to the SDGs.



712 students participated in 10 events hosted by NC State Global to discuss the **Sustainable Development Goals** of good health, zero hunger, clean water and energy, zero hunger and poverty and climate action.

View the Annual Sustainability Report online
go.ncsu.edu/SustainabilityReport



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