

**NC STATE**  
UNIVERSITY

# Sustainability Report

FISCAL YEAR 2023



The **2023 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, 2022 through June 30, 2023. 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.



# Academics

Goal: Integrate sustainability into education, experiences and research.

## Planning For Sustainability

The College of Agriculture and Life Sciences released its employee-driven strategic plan that emphasizes sustainability through the lens of the global Sustainable Development Goals to solve the grand challenges facing our world.

The College also implemented its first fully online agricultural sciences degree to meet the growing demand of students who want training in food and agriculture leadership.



# 972

first-year and transfer students completed the 2022 **Wicked Problems, Wolfpack Solutions** summer course on the Future of Food.

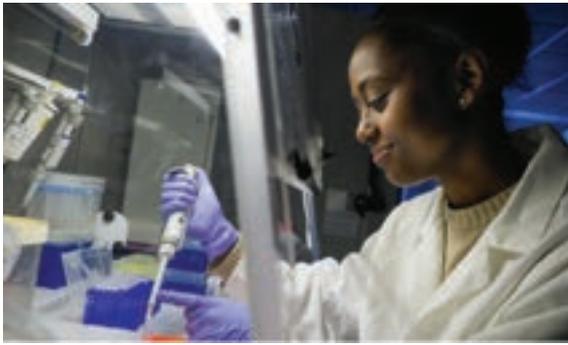
# 843

undergraduate and graduate courses related to sustainability are part of NC State's **Sustainable Development Goals Course Inventory** online tool.



## Introduction to Environmental Careers

147 students from majors and colleges across campus participated in the **Environmental First Year Program's** reimagined ENV 101 course.



### Game-Changing Health Research

Launched in September 2022, the new **Global One Health Academy** is fostering interdisciplinary collaboration to address complex health challenges impacting plants, animals, biodiversity and people in North Carolina and beyond.



### Sweet-APPS

The multidisciplinary Sweetpotato Analytics for Produce Provenance and Scanning project housed within the **N.C. Plant Sciences Initiative** leverages technology to minimize waste and maximize value for the North Carolina sweetpotato industry.

### ADDITIONAL RESEARCH HIGHLIGHTS:

**College of Design** students partnered with Eastman Chemical Company to design refillable, reusable and rechargeable packaging for the luxury cosmetics industry.

**College of Engineering** researchers are exploring ways wind-turbine blades and other structures can last longer utilizing self-healing materials.

**College of Humanities and Social Sciences** research finds that sustainability planning makes communities more competitive and resilient, both economically and environmentally, in the long term.

**College of Sciences** researchers developed a new visualization tool to help weather forecasters and atmospheric scientists improve their understanding of winter storms.

**College of Veterinary Medicine** offered students a new opportunity to train in apiary work and honeybee medicine.

The **Department of Biological and Agricultural Engineering** partnered with the **North Carolina Collaboratory** to analyze green infrastructure solutions that could increase flood resiliency in North Carolina.

**\$100**  
MILLION

contract will be supported by the **Center for Geospatial Analytics** to assess the impacts of global climate change on ecosystems and human health.

**\$2.25**  
MILLION

grant was awarded to the **College of Natural Resources** and **College of Agriculture and Life Sciences** to develop sustainable aviation fuel and graphite from wood waste and seaweed.

### Navigating Ocean Ecosystems

The **Blue Economy Innovation Program** was launched to fuel equitable, resilient and sustainable growth in next-generation maritime technologies and economies. Hosted within the **Coastal Resilience and Sustainability Initiative**, the program will also explore opportunities for workforce development across the state and region.

**Marine, Earth and Atmospheric Sciences** researchers were awarded a \$1.22 million grant to restore biodiversity in crucial coastal ecosystems, including oyster reefs, salt marshes and seagrass meadows.

To help fisheries managers improve their ability to set sustainable catches, NC State researchers create and apply spatial models to analyze commercial data.

NC State expanded its global presence by joining the **International Galapagos Science Consortium**, allowing both faculty and students to engage in collaborative interdisciplinary research on ecology, climate and marine science, engineering, tourism and more.

**College of Natural Resources** researchers are exploring the emergence and spread of ghost forests along the coast, a result of rising sea levels and increased salinity.

**College of Engineering** researchers have developed a robot capable of sorting and identifying microscopic marine fossils to advance our understanding of the world's oceans and climate -- both today and in the prehistoric past.

# Student Leadership

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



## Sustainable Student Leaders

The Sustainability Stewards leadership program celebrated 10 years of impactful action. Established in spring 2013 and coordinated by the University Sustainability Office, more than 130 students have helped cultivate a culture of sustainability at NC State as a Steward.

This year, 33 Stewards hosted 13 events including the annual Energy and Water Competition and Indigenous Peoples Environmentalism Panel. With support from the NC State Sustainability Fund, the Stewards also installed three new outdoor container gardens as part of their Campus Green Havens initiative.

## “LEEDing” the Way

Students in the LEED Lab course about sustainability went off-campus for the first time to partner with Durham Public Schools. The students developed recommendations for how a school facility could achieve Leadership in Energy and Environmental Design (LEED) certification.

# 15

student scholars were selected for the Kenan Institute for Engineering, Technology & Science (KIETS) **Climate Leaders Program** to help find viable solutions for climate challenges.

# 12

graduate students were chosen to join the **Global Change Fellows** program, sponsored by the Southeast Climate Adaptation Science Center, to conduct multidisciplinary climate change research.

## By Students, For Students

College of Design Landscape Architecture's Design + Build Studio students partnered with University Housing and the NC State Facilities Division to **transform an outdoor space** by Wood Residence Hall into a comfortable, inviting and sustainable environment to help connect students with friends and nature.

A Horticulture Science graduate student designed a **new campus garden** outside of D.S. Weaver Laboratories to provide students with fresh produce and the opportunity to engage in sustainable urban horticulture practices.

NC State Jenkins MBA students and the Business Sustainability Collaborative hosted over 150 students, community members and business leaders at the **2023 MBA FoodCon** to increase understanding of the sustainable food industry.

Seven student-led projects received grants from the **NC State Sustainability Fund** for fiscal year 2024. These include campus events promoting clean energy and sustainability resources, symposiums focused on climate challenges and environmental justice, installation of window film to prevent bird collisions, an initiative to raise awareness of upcycled materials, and equipment for students participating in prescribed burns of NC State's experimental forests.



### Engineering Sustainability

A focus on sustainability helped Industrial Systems Engineering students win first place in both the Fall 2022 and Spring 2023 **Senior Design Project** competitions in which they collaborated with project sponsors NC State Transportation, Waste Reduction and Recycling, and the University Sustainability Office.



### Campus As A Classroom

Coordinated by the University Sustainability Office, the **Campus As A Classroom** professional development internship program placed 20 students across campus to be immersed in real-world projects that directly advance campus sustainability.



### Winning Waste Solutions

Over 100 students spent January 27-29, 2023, competing to ideate, prototype and present sustainability solutions to global challenges as part of **NC State Make-A-Thon**. The top five winning teams focused on waste management, with the grand prize team developing a magnetic biochar hydrogel made from agricultural waste to absorb contaminants from wastewater.

5

Electrical Engineering students completed their senior capstone project on developing a design for a solar photovoltaic system and battery storage for NC State Facilities.

39

registered student organizations self-identified their groups as sustainability-related.

16

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

220

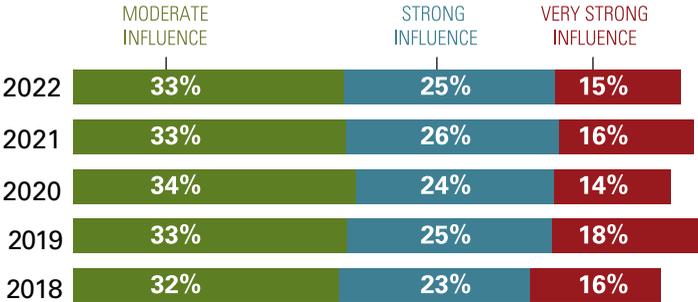
undergraduate students interested in sustainability lived and learned together in the **EcoVillage** on-campus residential community.

# Community and Culture

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

## 74%

of incoming students in 2022 indicated the university's commitment to the environment and sustainability influenced their decision to attend NC State.



## 155,756

pounds of food were distributed by **Feed the Pack Food Pantry** on campus. Of that, 23,542 pounds were collected as part of the inaugural year of Feeding the Pack Campus Challenge. The Pantry also celebrated its 10th anniversary of tackling hunger.

## 6,409

campus dining meals were donated by students and by NC State Dining to support students facing food insecurity.



The **N.C. Clean Energy Technology Center** commemorated 35 years of advancing clean energy solutions across North Carolina. This past year, the Center hosted 97 events, workshops and presentations in addition to 33 facility energy assessments that could potentially save \$11.7 million in energy costs for our community.



### Indigenous Student Success

A federal grant is helping to support Indigenous students on campus by building relationships between tribal communities and higher education.

**181** individuals engaged in the **Committee on Racial Equity in the Food System** workshop series hosted by the Center for Environmental Farming Systems.

**35** university workplaces, student organizations and events were **certified sustainable** during fiscal year 2023 in recognition of their actions, impact and leadership.

**15** companies matched with teams of students in the **Business Sustainability Collaborative's B Corp Clinic** to strengthen their social and environmental impact.

**5,248** students will save approximately \$602,000 every year in textbook costs thanks to a new **Alt-Text Project** sponsored by University Libraries and Digital Education and Learning Technology Applications (DELTA).



### Equity, Period

NC State's **Menstrual Equity Initiative** has installed free menstrual product dispensers across campus, ensuring access to essential hygiene products.



### Wolfpack Pride

The **NC State LGBTQ Pride Center** celebrated its 15th anniversary of promoting respect and creating a culture of equity, inclusion and social justice on campus.

### 2023 Sustainability Award Winners

Outstanding achievement awards for sustainability on campus were awarded to the following winners:

- Alie Akins (student category)
- Dr. Karen Leonas (faculty category)
- Laurel Krynock (staff category)
- NC State Turtle Rescue Team (department/organization category)
- Landscape Services (innovation/impact category)



### Building A Sustainable Future

The first annual **Black Research Symposium** explored how to build thriving, just and sustainable communities.

# Operations, Planning and Design

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

## Carmichael Achieves LEED Silver

The renovation and addition of **Carmichael Gym** earned Leadership in Energy and Environmental Design (LEED) certification at the Silver level. The revitalized space represents a holistic approach to well-being, recreation, fitness and physical education.





**Centennial Campus Buildings  
Certified for Sustainability**

Centennial Campus design and construction projects earned global recognition for Leadership in Energy and Environmental Design (LEED). **Fitts-Woolard Hall** earned certification at the Silver level in July 2022 while the **NC State Plant Sciences Building** certified for high performance and sustainability at the LEED Gold level in March 2023.

**27,298**

pounds of clothing, housewares, toiletries and food were collected during campus move-out in 2023 and donated to Feed the Pack Food Pantry and local community nonprofits.

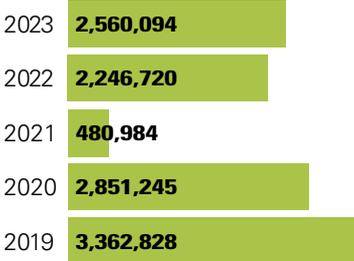
**551**

new bicycle registrations on campus.

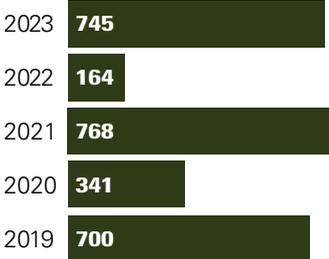


**Quality Refills**  
In 2023, the Water Quality Management Team implemented an ongoing testing program beginning with water bottle filling stations on campus. More than 110 filtered and unfiltered fixtures and water bottle filling stations across campus have been sampled with results posted online.

**WOLFLINE BUS  
PASSENGER BOARDINGS**



**PARTICIPANTS IN THE WOLFTRAILS  
ALTERNATIVE COMMUTER PROGRAM**



**Cruise Campus Sustainably**  
Transportation partnered with a new electric bike and scooter provider to reduce campus emissions and conduct research to improve campus accessibility and rider safety.



### The Corner

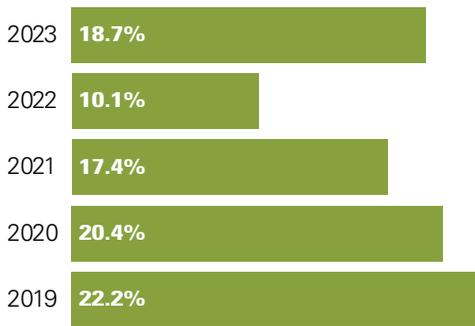
A new social hub designed with sustainability from the start opened on Centennial Campus. The open-air space utilizes repurposed shipping containers, picnic tables, pavers and café lights. Interior wooden tables and bar tops were also constructed from a campus tree that fell during a storm.



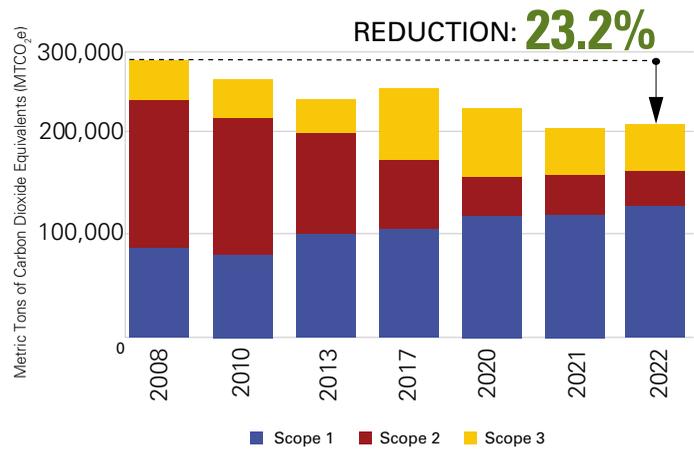
### Pack Power

Carter-Finley Stadium and Doak Field installed LED stadium lighting to improve gameday experiences and reduce energy consumption. NC State Athletics also moved to electronic tablets for their pressbox with the support of the Sustainability Fund, saving over 17,000+ sheets of paper.

### LOCAL FOOD PURCHASED BY NC STATE DINING



### CAMPUS GREENHOUSE GAS EMISSIONS

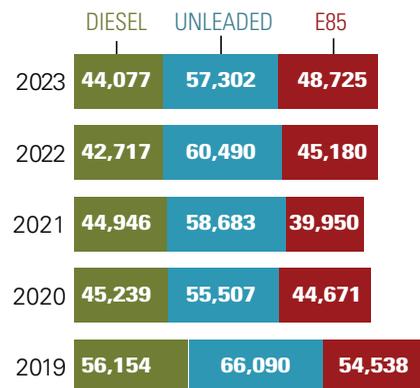


### Building Sustainability

In addition to seven student-led projects, the **NC State Sustainability Fund** awarded fiscal year 2024 grants to six campus projects with potential to advance sustainability of facilities or campus operations:

- Addition of composting bins inside the TowneBank Center of Carter-Finley Stadium
- An app to enable self-guided tours of campus trees
- Expansion of a campus greenhouse to grow more landscaping plants on-site
- A Sustainable Labs Program to identify ways to reduce the energy, emissions, water and waste footprint of campus research labs
- A microbiological research and engagement project at the NC State Compost Facility and Research Cooperative
- Construction of mountain biking trails at Lake Raleigh Woods

### FUEL TYPE USED IN FACILITIES DIVISION VEHICLES\*



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



### Uniform Solutions

Talley Student Union implemented a reuse and recycling program for discarded uniforms and unneeded office supplies and equipment.



### Underground Bees

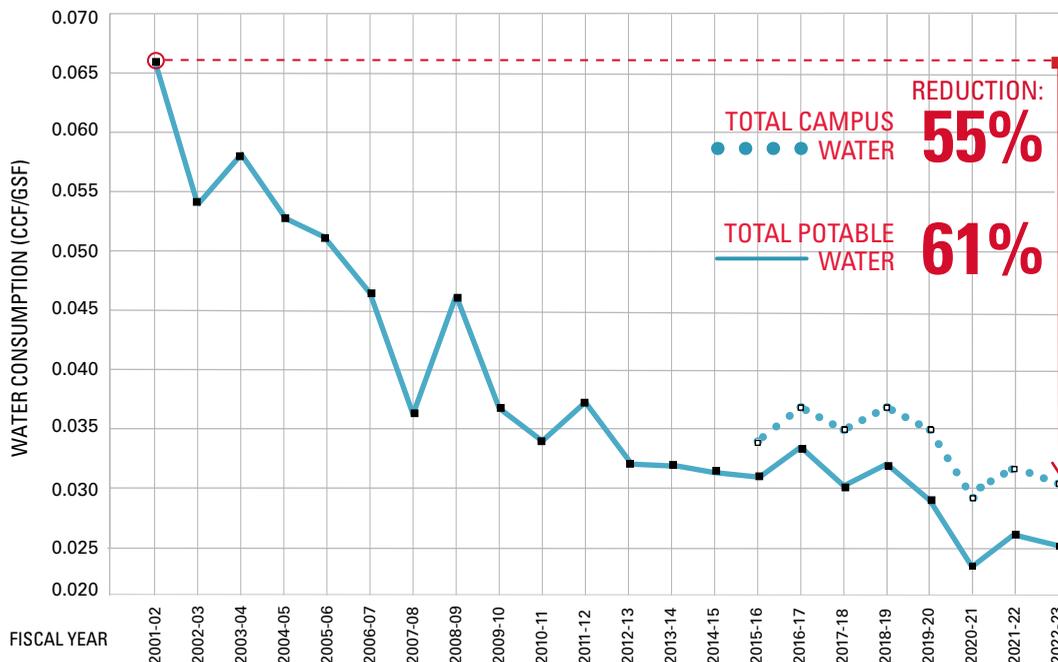
The impact of landscaping decisions on a local breeding colony of ground-nesting bees was explored as part of the Campus As A Classroom program.



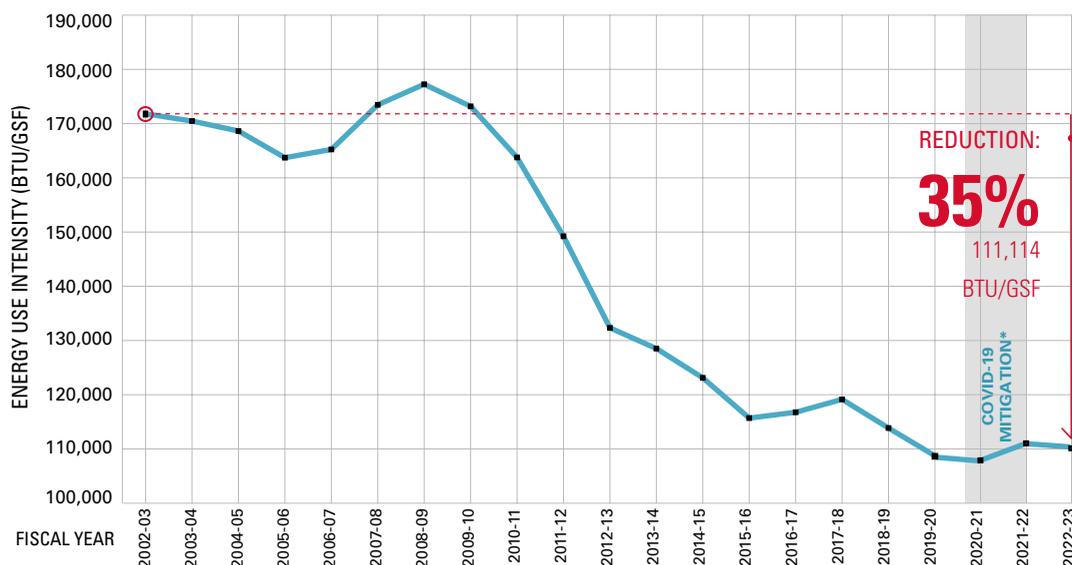
### New Online Sustainability Map

From beehives to zero waste, a new online map helps users explore the infrastructure and initiatives that showcase NC State's commitment to sustainability.

## CAMPUS WATER USE PER GROSS SQUARE FOOT 1 CCF = 748 GALLONS



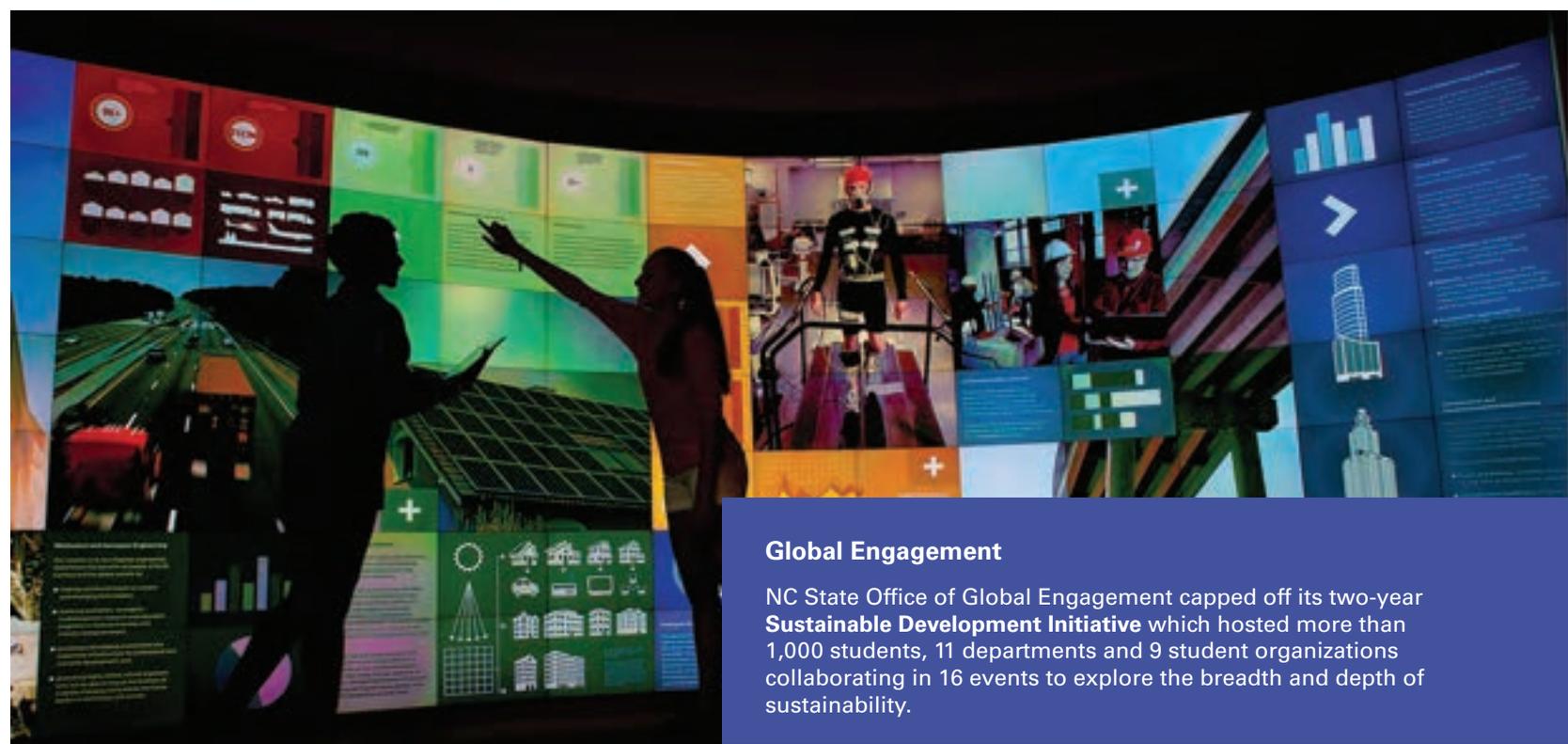
## CAMPUS ENERGY USE PER GROSS SQUARE FOOT



*\*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.*

# Communications

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



## Global Engagement

NC State Office of Global Engagement capped off its two-year **Sustainable Development Initiative** which hosted more than 1,000 students, 11 departments and 9 student organizations collaborating in 16 events to explore the breadth and depth of sustainability.

**2,002**

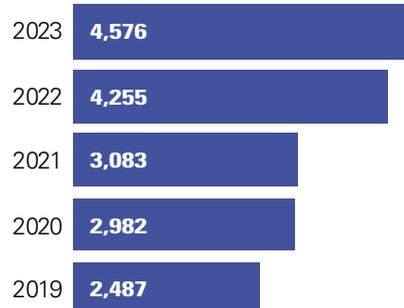
incoming students requested information about campus sustainability.

**106,675**

pageviews on [sustainability.ncsu.edu](https://sustainability.ncsu.edu)

**4,576**

average weekly readers of NC State Sustainability's e-newsletter.



**10,248**

followers of NC State Sustainability's social media accounts.



### Communicating About Sustainability

- A new course available to **University Honors Program** students teaches the power of effective and ethical messaging to create meaningful impact through storytelling.
- NC State researchers developed field kits to equip farmers with the knowledge and tools necessary to navigate climate change threats.
- A new framework developed at NC State estimates the total economic value of improving water quality in urban streams was designed to better inform regulatory decisions by state and federal agencies.
- NC State researchers found that students who speak more than one language score high on their motivation to advocate for ocean sustainability.
- Student analysis of NC State Sustainability’s Instagram activity reveals that utilizing videos boosts the account’s reach.



# 367

sustainability-related events were hosted on campus – a 57% increase from 2022. Of this, 68 events were part of NC State **Earth Month** in April 2023.

# 946

people attended 10 events during NC State 2022 **Energy Week** to explore the university’s energy use, research and opportunity to shape a clean energy future.

# 718

community members aged 50+ attended 38 courses related to the global sustainable goals and hosted by the **Osher Lifelong Learning Institute (OLLI)** at NC State.

# 337

campus employees and students completed **online courses** on sustainability, recycling, composting and zero waste through NC State’s online learning management system.



### Sustainable Wolfpack

Claire Henson, a Campus As A Classroom intern for NC State Athletics Fan Experience & Marketing, hosted 10 **Sustainable Wolfpack** games across the academic year to engage more than 88,876 fans and raise awareness about sustainability.

### Globally Ranked

NC State is globally recognized for sustainability impact in the Times Higher Education 2023 Impact Report. In addition to being in the top 300 globally for the overall ranking, NC State also ranked No. 47 globally for impact toward Sustainable Development Goal 14, which is Life Below Water.

In the QS World University Rankings, NC State ranked No. 18 in the U.S. for Sustainability Research.

NC State was also selected to the Princeton Review’s 2023 Guide to Green Colleges.

View the Annual Sustainability Report online  
**[go.ncsu.edu/SustainabilityReport](http://go.ncsu.edu/SustainabilityReport)**



120 copies of this report were printed for campus distribution on 100% post-consumer recycled paper that is Forest Stewardship Council Certified.