



# 2021 Sustainability Report



THE UNIVERSITY  
*of* NORTH CAROLINA  
*at* CHAPEL HILL



**Sustainable**  
Carolina

# A Word from the Sustainable Carolina Team

Established in 2020, Sustainable Carolina is the UNC Institute for the Environment's team of professionals tasked with collaborating with campus partners to build and balance societal well-being, ecological integrity, and economic prosperity now and into the future. True sustainability requires a concerted, interdisciplinary effort between all departments, offices, and individuals. As the hub for sustainability at UNC, we are developing new ways to engage the UNC community and provide updates on the University's progress. This report is designed to provide highlights of sustainability endeavors across campus through a broad lens while we continue to zoom in on all of the great sustainability work through our website, newsletter, and social media posts.

There is a wealth of sustainability-related activity happening on campus, and we strive to capture all of your stories through either this report or our other media. [Contact us](#) to share your story.



# 2020 UNC GREENHOUSE GAS BY THE NUMBERS

In 2007, The University of North Carolina at Chapel Hill signed the American College and University President's Climate Commitment (ACUPCC). In signing this, Carolina committed to carbon neutrality by 2050 and agreed to conduct annual greenhouse gas (GHG) inventories in order to track progress.

**2007** 589,237 Metric Tons of Carbon Dioxide Equivalents (MTCO<sub>2e</sub>)

vs

**2020** 354,833\* Metric Tons of Carbon Dioxide Equivalents (MTCO<sub>2e</sub>)

\*This value may change by <0.05% with new data.

## 40% OVERALL DECREASE IN GHG EMISSIONS

### Impacts from the COVID-19 Pandemic

The pandemic disrupted campus operations and thus affected GHG emissions. We are working to understand the degree to which GHG emissions changes are attributable to sustainability practices or to pandemic disruptions. As we continue to move towards carbon neutrality we are looking for lessons from the pandemic (e.g. flex work, reduced demand for travel) that may be helpful in reaching our goals.

### MOVING TOWARDS OUR GOAL

Carolina released an updated Climate Action Plan in 2021 with a new carbon neutrality goal of 2040. The plan contains many strategies for emission reduction including:

#### Energy Efficiency

Carolina is constantly working to reduce energy use by making buildings as efficient as possible



#### Cogeneration Fuel Switching

Carolina is working to reduce greenhouse gas emissions at the cogeneration facility by increasing natural gas use and reducing coal use while exploring many alternatives including biofuels, electric boilers, and carbon capture



#### Renewable Electricity

Carolina is working to utilize as much renewable electricity as possible by increasing onsite solar generation and finding ways to purchase renewable energy



#### SINCE 2007



Carolina's steam use has decreased **23%**



Carolina's fleet emissions have decreased by **17%**



Carolina has reduced its coal use by **52%**



By fixing leaks and changing refrigerants, Carolina has reduced refrigerant emissions **3%**

#### SINCE 2014



Due to lower meat consumption and efficient food purchasing, food emissions decreased **41%**

**Sustainable Carolina**



THE UNIVERSITY of NORTH CAROLINA at CHAPEL HILL

# OPTIMIZING OPERATIONS

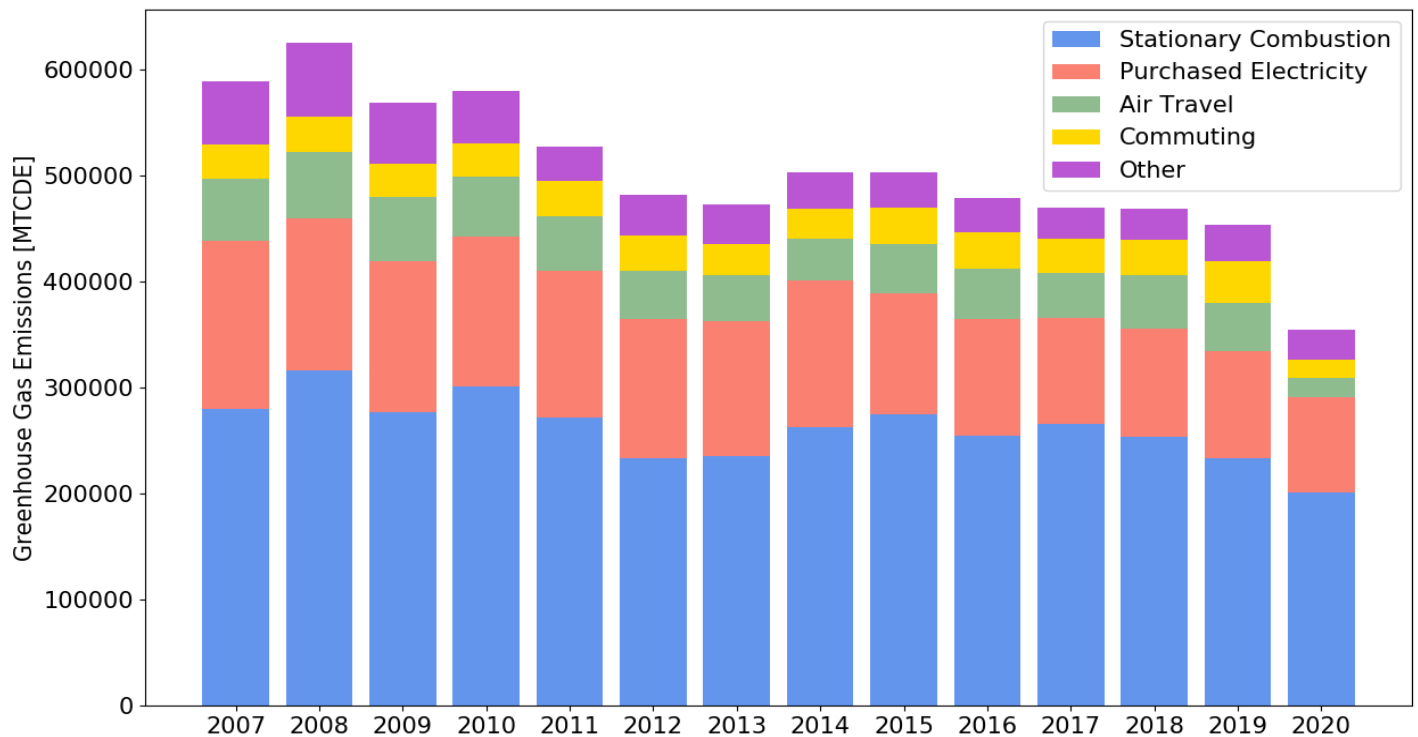
Campus operational units have developed new plans and exciting progress has been achieved. Investments and planning around operations are bringing UNC closer to achieving the Three Zeros and other sustainability goals. Data documenting progress towards goals are highlighted.

## Climate Action Plan

UNC released a draft version of an updated [Climate Action Plan](#) this year. The original Climate Action Plan was published in 2009. Since then, 75% of the near-term strategies have been implemented. The new plan declares a carbon neutrality goal of 2040 and details current strategies to reach this more ambitious goal. Feedback on the plan was collected and addressed, and a final version of the plan has been released. Strategies include replacing fossil fuels with cleaner power sources, increasing building efficiency across campus, and adding more electric vehicle charging stations.

## Energy Efficiency

UNC is working towards the energy efficiency goal set by Governor Cooper's Executive Order 80: a 40% reduction in energy use intensity (EUI) of state-owned buildings by 2025. EUI is a measure of energy use per square foot of building space. Since 2003, UNC has decreased EUI by 36% as a result of constructing more energy efficient new buildings and the efficiency efforts of UNC's [Energy Management](#). Energy Management continues to promote energy conservation through new building construction, major building renovation projects, and LED lighting upgrades.



Column chart of UNC greenhouse gas emissions since 2007.

## Greenhouse Gases

The 2020 Greenhouse Gas Inventory shows a 40% reduction in emissions compared to the baseline year. With the COVID-19 pandemic causing disruptions to campus operations throughout most of the year, it is not yet clear the degree to which emissions reductions were the result of institutional efforts or the consequence of decreased campus use. Travel-related emissions were the most impacted by the pandemic while energy-related emissions were least impacted.

## Waste Recovery

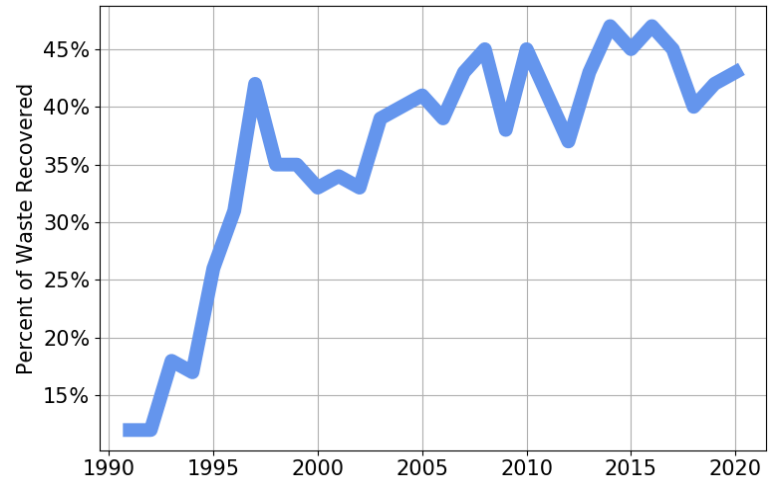
According to the most recent [OWRR Trend Report](#), 57% of campus waste is sent to the landfill while 43% is recovered (recycled or composted). The recovery rate is up from 12% in 1990. A 2017 study of campus waste found that 20% of landfill waste could be recycled and 52% of landfill waste could be composted.



BJ Tipton, Waste Diversion Manager, stands with sorted waste materials.

## Carolina Dining Services

CDS released their [annual sustainability report](#) highlighting achievements and setting sustainability goals around food purchasing, community engagement, and waste reduction and diversion. The Meat “Less” Mondays program has supported an overall reduction in meat and fish purchases on campus while fruits, veggies, and grains have become more popular. CDS won [NACUFS Sustainability Awards](#) in the Outreach and Education category: Silver in 2019 for the EatSortWin campaign and Gold in 2020 for Choose2Reuse. These campaigns were aimed at educating campus users on recycling and composting best practices.



## Move-Out Donations

Carolina Housing once again partnered with TROSA treatment facility, Carolina Thrift, and the UNC Office of Waste Reduction and Recycling to host the [Don't Ditch It, Donate It!](#) Program. The program ran from April 30 to May 15, 2021 to provide donation bins for clothes, furniture, school supplies, non-perishable foods, and more. Since its inception in 2009, the program has saved over 500,000 pounds of unwanted items from entering the landfill. This year, 1,126 pounds of food were collected by Carolina Cupboard, the student-run food pantry. To date, 35,420 pounds of mattresses have been recycled.

## Potable Water Conservation

Potable water consumption per square foot on campus has decreased by 61% from the 2003 baseline. The reduction is the result of increased use of non-potable water from the Reclaimed Water utility near campus, the use of captured rainwater and condensate from cistern storage, and significant investments in water conservation strategies. For more information on water, check out the [Strategic Energy & Water Plan](#).

## Water Analytics

In 2020, OWASA (the Orange Water and Sewer Authority) supplied UNC with water analytic software, Aqua Vista, that provides interval water use data that can be trended and used for notifications, including leak detection. Energy Services and Energy Management have started using this analytic tool to provide earlier detection of leaks and to identify high water consumers in different user categories. This tool may have the potential for providing timely information that can lead to decreased water consumption. In spring and summer 2021, Energy Services and Energy Management co-mentored student interns who developed visualization tools based on the enhanced data provided by this software.



# STUDENT LEADERSHIP

UNC is fortunate to have ambitious undergraduate and graduate students taking on leadership roles in sustainability-focused student organizations across many disciplines. Dedicating their time, energy, and problem-solving skills to important issues accelerates progress.

## RESPC

UNC's [Renewable Energy Special Projects Committee](#) has provided rebates to 26 labs across campus for their purchase of highly efficient freezers under the Efficient Freezer Rebate Program. RESPC has also installed an electric vehicle charging station in the Craige Parking Deck, a 20-kW solar panel system on the roof of the Student Union, and occupancy sensors in the School of Public Health automatically shutting off lights when a room is unoccupied.

## Impact Investing Club

The [Impact Investing Club](#) is a community of undergraduate students dedicated to increasing the exposure of impact investing concepts among the UNC student body and explain how sustainable investing activities can be utilized to reduce current climate-related issues. Since 2018, the members of the Impact Investing Club at UNC have been working to research and follow the trends in the impact investing space, including the activity amongst our peers at other undergraduate impact clubs.



The Carolina Beekeeping Club rehomed a swarm of bees to a hive atop the FedEx Global Education Center. The club also hosted a bee biology lecture and a basics of beekeeping virtual event with Geneva Green, a groundskeeper and master beekeeper.

A bee keeper checks her hives as staff members, volunteers and students work in the Community Garden at UNC.

## Student Dining Board

The [Student Dining Board](#) is a group that meets weekly to discuss the food program at UNC. The purpose of the Dining Board is to keep an open channel of communication between the administration and the student body. The Board's responsibilities range from reviewing CDS' Annual Plan, which includes Meal Plan options, budgets, operating hours, menus, and staffing needs.



## CLEAN Medicine

Medical students founded [CLEAN](#) (Climate Leadership & Environmental Action Network) at UNC School of Medicine in 2020, recognizing that environmental crises pose an urgent threat to human and planetary health. CLEAN completed the Planetary Health Report Card in 2020-2021 and is working with UNC leaders to enhance planetary health education and health system sustainability. Affiliated with Medical Students for a Sustainable Future, North Carolina Clinicians for Climate Action, and the Medical Society Consortium on Climate and Health, CLEAN advocates for intersectional environmental justice and health equity as part of a global movement for climate action.



Students collect food waste for CompostMates.

## CompostMates

In fall 2020, a group of UNC students created [CompostMates](#) to help expand access to composting for off-campus students in the Chapel Hill and Carrboro area. CompostMates offers a free, contactless, twice monthly collection service for those without the time, space, transportation, and/or funds to donate food scraps or maintain their own compost. CompostMates received a 2021 Bryan Fellowship from the Carolina Center for Public Service.

## Alternative Protein

The UNC [Alt-Protein Project](#) was founded in 2020 with the intent of building a healthy, sustainable, and just food system by creating a vibrant and robust community for alternative protein research and innovation. The group focuses on three categories of food technology: recreating the component parts of meat using plants; growing microorganisms to produce food ingredients and biomass; and cultivating genuine animal meat directly from animal stem cells.

2,000+

pounds of food waste were diverted from the landfill by CompostMates of UNC in spring 2021.



# RESEARCH & INNOVATION

Sustainability is a theme throughout much of Carolina's billion-plus dollar annual research activities. Fulfilling the university's mission to move North Carolina, our country and the world forward, these efforts are central to Carolina's sustainability efforts.

## CHASE

The U.S. Department of Energy recently granted \$40 million to the Center for Hybrid Approaches in Solar Energy to Liquid Fuels ([CHASE](#)) which is headquartered at UNC. The University and its five partner institutions utilize a multidisciplinary approach in a highly collaborative setting drawing on expertise across a broad range of disciplines including chemistry, physics, and materials science. Pairing light-absorbing properties of semiconductor materials with the selective fuel-producing reactivity of molecular catalysts, CHASE will advance a new paradigm of liquid solar fuels generation.



CARDNL researchers operate an unoccupied aerial vehicle.

## CARDNL

The recently-launched Carolina Drone Lab ([CARDNL](#)) serves as a resource for faculty, student, and community members to use for a host of research endeavors. The lab provides expertise in using drones - or unoccupied aerial vehicles - for research and can supply equipment including drones, sensors, survey equipment and software. Drones are emerging as an important tool for gathering data for a host of disciplines or projects.

## Data-Driven Envirolab

The Data-Driven Envirolab ([DDL](#)) is a collaboration between the public policy department and E3P employing policy experts, data scientists, visual designers, and interactive programmers. The Lab uses cutting edge data analytics to create solutions to the world's environmental problems. The lab also has opportunities for citizen scientists. DDL is partnering with the NC Museum of Life and Science to launch a citizen science campaign to collect high resolution data on urban heat and thermal comfort utilizing hand-held sensors and a smartphone app.



## NC Policy Collaboratory

The NC Policy Collaboratory released its [final report](#) on flood resiliency in June 2021. The Collaboratory received \$2 million from the North Carolina General Assembly in 2019 as part of a disaster recovery package approved by the legislature. The Collaboratory was charged with studying flooding and resiliency against future storms in eastern North Carolina and developing an implementation plan with recommendations. A team of researchers evaluated issues including policies related to flood plain management, examining natural systems role in mitigating flooding, and studying the public health impacts of flooding.

## Water Institute

The UNC Water Institute held its annual Water and Health Conference in October 2020. The event brings together researchers, policymakers, practitioners, technology providers and donors from around the world to examine the latest trends and evidence to inform policy and practice in water, sanitation and hygiene (WaSH). For the first time since it was established in 2009, the conference was held online with no registration fee. More than 3,500 people participated in more than 140 countries. This year's [conference](#) is scheduled for October 4-8.



Johanna Rosman performs wave and shoreline research in Albemarle Sound at Jockey's Ridge State Park in Nags Head, North Carolina.

**74%** of UNC departments are engaged in sustainability research.

## Centers in Professional Schools

Several professional schools at UNC have research centers focusing on sustainability issues. For more information, follow the links below.

School of Law: [Center for Climate, Energy, Environment & Economics](#)

School of Government: [Environmental Finance Center](#)

Kenan-Flagler Business School: [Center for Sustainable Enterprise](#)

Gillings School of Public Health: [Center for Environmental Health and Susceptibility](#), [The Water Institute](#), [The Institute for Environmental Health Solutions](#)

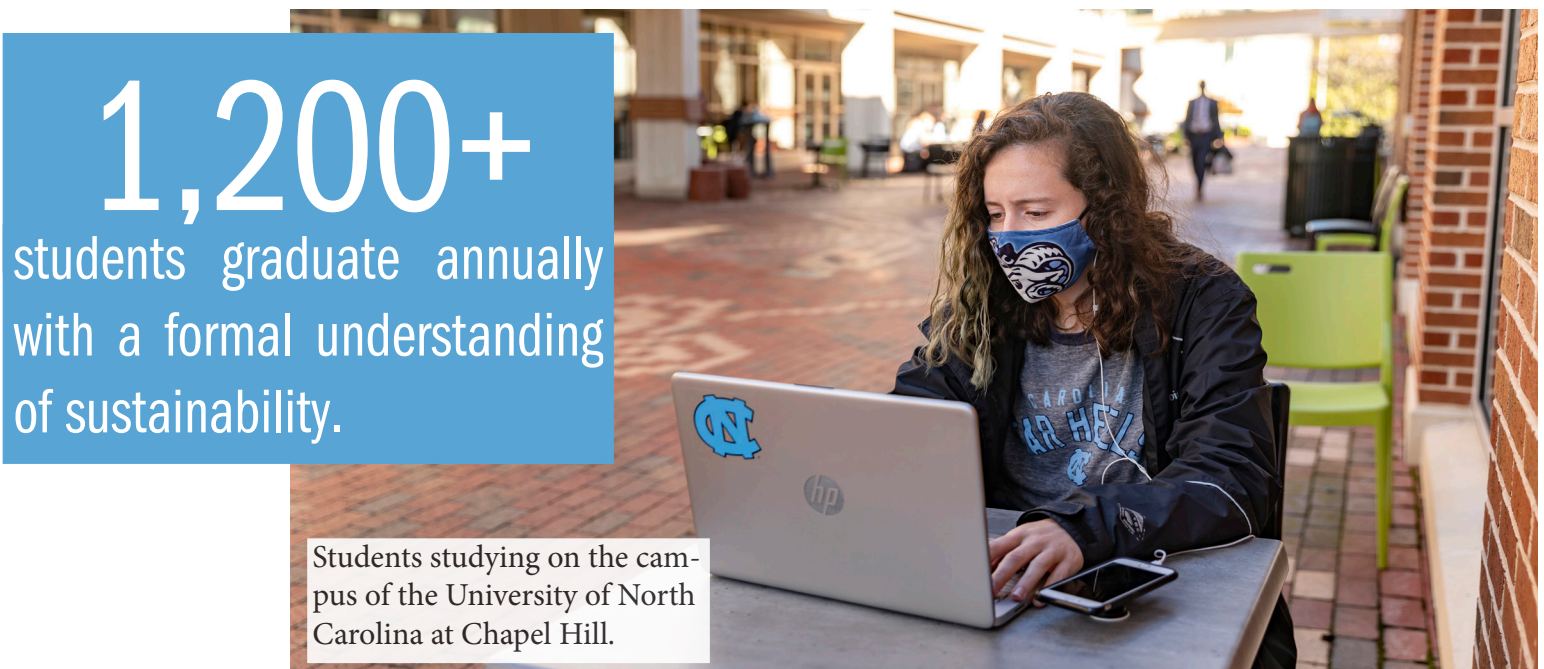
School of Medicine: [Center for Environmental Medicine, Asthma and Lung Biology](#)

# CURRICULA

Students focused on careers in sustainability can choose from myriad opportunities throughout the university. Recent reorganization and re-focus has deepened the resources available to Carolina's students interested in understand the challenges and helping find solutions for the challenges we face around sustainability.

## IDEAs in Action

The [IDEAs in Action Curriculum](#) was approved by Faculty Council in spring 2019 and will launch in fall 2022. The goal of the new curriculum is to graduate students who have the capacities, tendencies, and habits of mind to approach the world with inquiry, investigation, evidence, judgment, and creativity. Some of the new learning outcomes require an understanding of human and environmental challenges that transcend national borders and of differences between personal ethical decisions and those bearing on the public and civic spheres.



1,200+  
students graduate annually  
with a formal understanding  
of sustainability.

Students studying on the campus of the University of North Carolina at Chapel Hill.

## E<sup>3</sup>P

The new interdisciplinary Environment, Ecology and Energy Program ([E<sup>3</sup>P](#)), was launched in 2018. The program incorporates natural sciences, social sciences, and humanities to teach students how to best manage resources in an ever-changing world. E<sup>3</sup>P offers undergraduate degrees in environmental sciences (BS) and environmental studies (BA) and graduate degrees in ecology (MA, MS, PhD). Degrees include tracks in quantitative energy systems (BS) and in sustainability (BA).

## Public Health

The Gillings School of Public Health offers four tracks within the [BSPH](#) major: Biostatistics, Environmental Health Sciences, Health Policy and Management, and Nutrition. Since the 2013-2014 academic year, the number of BSPH degrees conferred by the School has more than doubled. The School also offers several [Master's](#) and [PhD](#) programs which allow students to harness their sustainability interests.

## EMES

The new Department of Earth, Marine and Environmental Sciences ([EMES](#)) brings together more than 30 faculty, nearly 70 graduate students, and numerous researchers and technical staff from two departments on campus, Geological Sciences and Marine Sciences, and the Institute for Marine Sciences in Morehead City, N.C. The merger leverages the natural alignment between earth and marine sciences and strengthens connections among faculty to grow interdisciplinary research and build new student programs.



# EXPERIENTIAL EDUCATION

UNC's experiential education programs offer students structured, active learning opportunities that invite them to integrate and apply their knowledge and skills in a real-world environment.

## EcoStudio

[EcoStudio](#) hosted 72 student internships over the academic year, many of which counted for course credit. Sixteen of this year's EcoStudio projects were UNC-affiliated including internships within Energy Management, Green Labs, the Botanical Gardens, Edible Campus, and the Center for Sustainable Enterprise. Other participating departments include Energy Services; Environment, Health, and Safety; and Sustainable Carolina.

## Field Sites

The Institute for the Environment, in partnership with E<sup>3</sup>P, established a network of field sites with locations in North Carolina and abroad. Each site focuses on themes specific to that community or region and provides a semester-long opportunity for students to explore real-world issues through a combination of course work, field trips, group research projects and internships with local organizations. Challenges facing host communities help shape the curriculum at each site, and the results of research by UNC-Chapel Hill faculty and students are shared with community partners.

### Concentration Areas

[Ecology and Environmental Infrastructure](#)  
[Decision-making and Environmental Infrastructure](#)  
[Ecology, Earth System Science and Environment and Health](#)  
[Sustainability and Environmental Infrastructure](#)  
[Energy, Environmental Infrastructure and Sustainability](#)

### Location

NC Mountains  
Outer Banks, NC  
Morehead City, NC  
Triangle area, NC  
Bangkok, Thailand

## Study Abroad

The Study Abroad Office offers a wide range of programs that vary by cost, location, length, and program type. More than one-third of Carolina students study abroad, and the Carolina Global Guarantee ensures that all students can avail themselves of global learning opportunities regardless of finances. The programs below offer a focus on sustainability within the curriculum.

### Program Name

[School for Field Studies](#)  
[Arava Institute for Environmental Studies](#)  
[Summer School for Sustainability](#)  
[School for International Training \(Multiple programs\)](#)  
UNC Environmental Studies in Galapagos  
UNC Environmental Sustainability in Australia  
UNC Burch in China and South Korea (Renewable Energy)

### Location

Multiple  
Kibbutz Ketura, Israel  
Gothenburg, Sweden  
Multiple  
San Cristobal, Ecuador  
Brisbane, Australia;  
Townsville, Australia  
Seoul, South Korea;  
Shanghai, China; and  
Shenzhen, China

# COMMUNITY ENGAGEMENT

UNC strives to create a positive impact within and beyond the boundary of campus. Engaging and collaborating with local communities around sustainability issues creates a better society and a stronger future for all of us.

## Town of Chapel Hill

Building on past collaborations around sustainability and the environment, the partnership between the University and the Town is delivering documented successes. Key to this effort is the joint commitment to climate action best demonstrated by the release of complementary [climate action plans](#) in the spring of 2021. In 2019, RESPC contributed \$380,000 to Chapel Hill Transit for the [electric bus pilot project](#). Additional funds for the \$3 million project are from the Federal Transit Administration and the Chapel Hill Transit funding partners including the Town of Chapel Hill.

## Bike Share

The Town and UNC coordinated with Bolt Mobility to move a [Tar Heel Bikes](#) hub from campus to Downtown Chapel Hill. The hub on the southeast corner of West Franklin and Church streets will test ridership and inform future shared mobility options in Chapel Hill. For more information on how to use Tar Heel Bikes, please visit [move.unc.edu/bikeshare](https://move.unc.edu/bikeshare).

UNC is recognized as a Bike Friendly University by the League of American Bicyclists.



A student rides across campus on a Tar Heel Bike.

## CPES

The UNC Institute for the Environment's Center for Public Engagement with Science ([CPES](#)) collaborated with the North Carolina Museum of Natural Sciences to conduct a virtual academy on climate change. High school students enrolled in the Youth Engaging in the Science of Resilience in Urban and Rural NC ([YES-Resilience](#)) program explored climate change in their local communities and investigated climate mitigation and adaptation strategies throughout this year-long program. Students learned about building a resilient food system, evaluated solutions that promote resilient waterways, and examined the ecosystem services that forests provide. In addition, CPES also hosts other [youth science enrichment](#) programs, [citizen science](#) collaborations, and [internships and research opportunities](#).



## North Carolina Botanical Garden

The [North Carolina Botanical Garden's](#) two community garden programs, the [Carolina Community Garden](#) and [Edible Campus UNC](#), are recipients of an award from the U.S. Botanic Garden and American Public Gardens Association. The award helps sustain urban agriculture and community food-growing during the COVID-19 pandemic. With this award, the programs will be able to continue to grow and distribute produce to community members who need it, support the work of student interns in need of educational opportunities, and implement online education programming through social media and other platforms until it is safe to gather in person.

**2,500** seedlings were planted across campus, producing herbs, fruits, and vegetables for any campus user this year.



A staff member waters plants in Edible Campus.

## Equitable Food

Carolina Dining Services has formed a partnership with [4P Foods](#), a local food hub, to help connect dining services to local farmers. 4P Foods works with more than 250 sustainable family farmers in the Mid-Atlantic for the best quality and variety of fresh food. The program gives back through food equity initiatives such as the delivery of 7,500 pounds of food per month to underserved communities.

## Feeding Those in Need

Launched in July 2020, the [Chatham Food Hub](#) was a one-stop shop to safely buy food from local places you know and love. Each week, local businesses sold meals and produce through the Hub. The hub donated 862 servings of prepared food to Chatham County residents through local nonprofit and governmental partners and distributed 220 CORA emergency food boxes to individuals.



# COMMUNICATIONS

Keep up with more sustainability progress and stories throughout the year by following podcasts, social media, and more.

## Innovating to a Clean Economy Podcast

The Institute for the Environment released new episodes of its Innovating to a Clean Economy podcast. This IE Cleantech podcast provides a closer look at people who are driving cleantech innovations and how they contribute to the cleantech economy. Episodes from the first season explored vehicle-to-grid technology, innovations targeting our oceans or blue tech, the future of electric vehicles, precision farming and transforming the American power grid. Check out the [new season](#) now.

## Sustainable Carolina Podcast

Sustainable Carolina released the first episode of its new podcast, the Sustainable Carolina Podcast. The introductory episode features Mike Piehler, UNC's Chief Sustainability Officer and Director of the Institute for the Environment, and outlines exciting news around the Champion Sustainability Fund. This green revolving fund will support innovative sustainability programs and initiatives that move Carolina closer to its goals of integrating sustainability practices into the University's research, education and service activities. Future episodes will feature guest interviews, deep-dives into campus operations, and news updates.

## Social Media

Follow us on Twitter [@Sustainable UNC](#), Facebook [@sustainablecarolina](#), and Instagram [@sustainable\\_unc](#).

# RECOGNITION

UNC strives to be a sustainability leader among our peer universities.



## Carolina Metrics

Keep track of UNC's Sustainability Performance Rating and others metrics [here](#).



## AASHE

For the third time in a row, UNC received a GOLD rating from AASHE in 2020.

## The Princeton Review

In 2021, the Princeton Review recognized UNC as a Green College.

## Kiplinger

For the 18<sup>th</sup> time, Kiplinger's Personal Finance magazine has ranked UNC the No. 1 value in American public higher education.