COLLEGE OF AGRICULTURE, HEALTH AND NATURAL RESOURCES

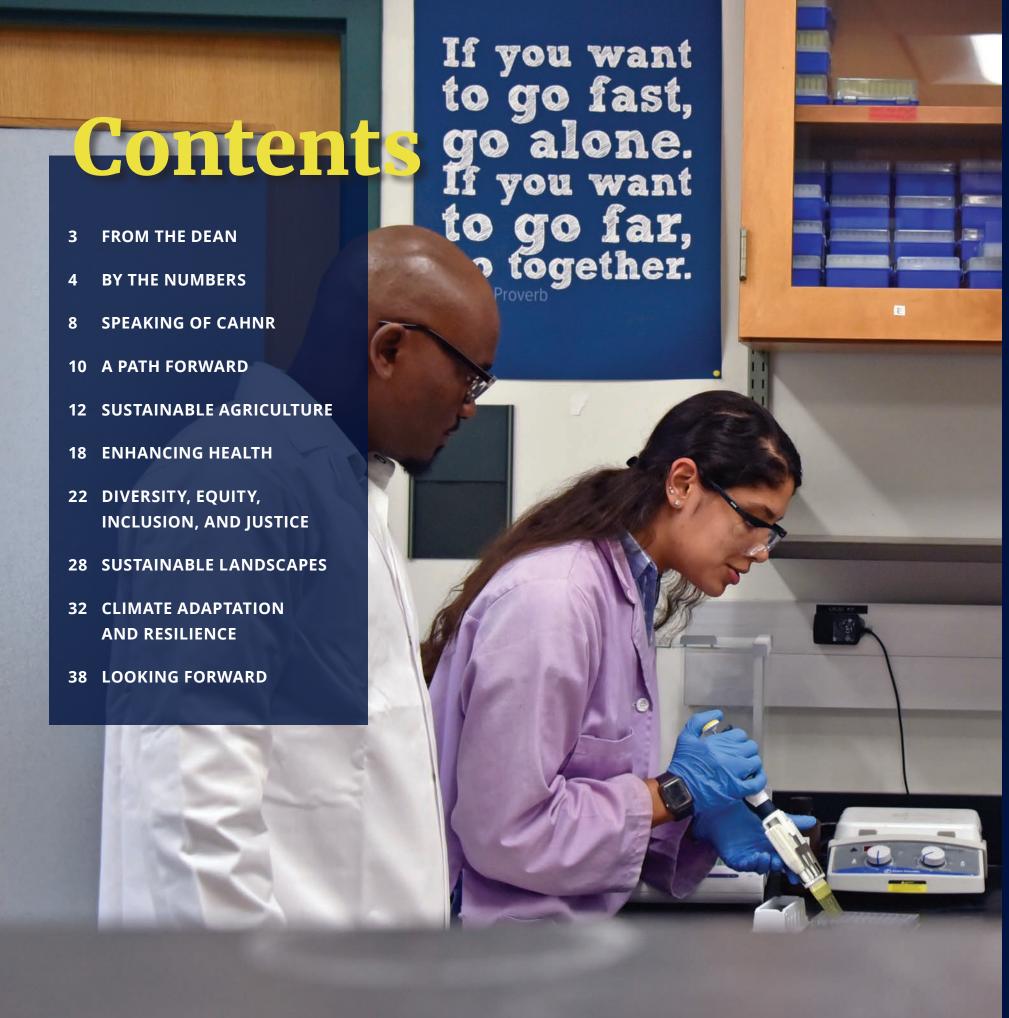
IMPACTS













THE WORLD IS CHANGING.

CAHNR IS MEETING THE CHALLENGE.

From the Dean

In recent years, society has seen changes on an epic scale. From the COVID-19 pandemic to an ever-changing climate, our status quo is anything but. That's why we're taking an innovative, agile, and collaborative approach to ensure we're prepared for whatever comes next.

At UConn's College of Agriculture, Health and Natural Resources (CAHNR), responding to challenges and driving change is in our DNA. From our early days as the Storrs Agricultural College, our commitment to research, education, and extension programs that address the evolving needs of our time has never wavered. Now, as a comprehensive College that covers diverse aspects of agriculture, human and animal health, and the environment, our work continues to push the boundaries of what is possible.

Last year, CAHNR faculty, students, and staff created knowledge and strengthened partnerships that support growth not only in our state, but around the nation and the world. From addressing native seed shortages to commercializing vaccines for a global virus that is devastating the pork industry, CAHNR work provides solutions to the world's great challenges.

That's why CAHNR continues to advance our strategic vision as well as our contribution to UConn's land-grant mission. With the collective strength of our flagship university and our communities, we'll be prepared for whatever the future holds.

Indrajeet Chaubey, PhD

Indicate Chause

Dean and Director, College of Agriculture, Health and Natural Resources

The impact of our work goes beyond numbers, but data from 2023 highlights CAHNR's success in delivering accessible, transformational education, conducting innovative research, and reaching Connecticut communities with dedicated extension outreach.





2,700+

35%

FIRST-GENERATION STUDENTS

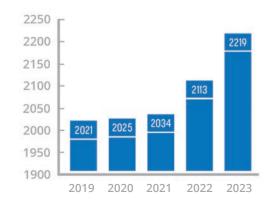


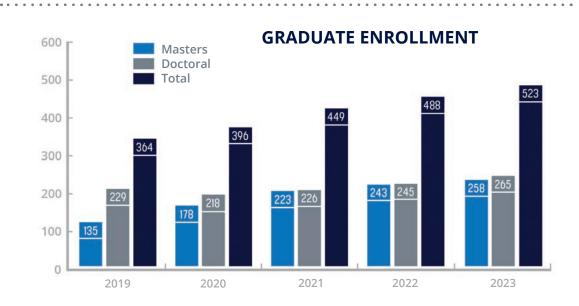
22K+



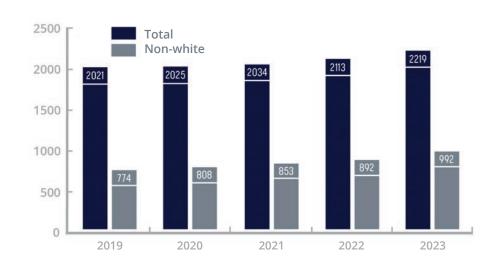
Education

UNDERGRADUATE ENROLLMENT

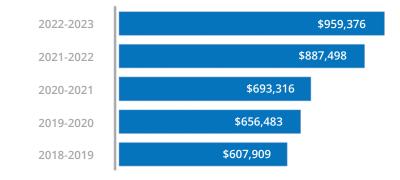




DIVERSITY TRENDS CAHNR Undergraduate Students



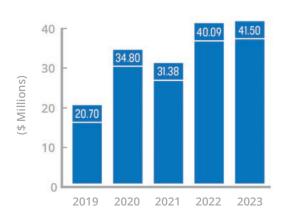
SCHOLARSHIPS AND AWARDS





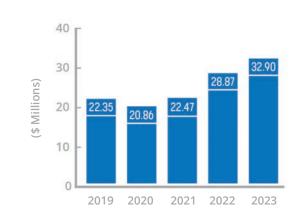
Research

EXTERNAL RESEARCH AWARDS



6 COLLEGE OF AGRICULTURE, HEALTH AND NATURAL RESOURCES

RESEARCH EXPENDITURES



404 **HIGH IMPACT**

PUBLICATIONS





FACULTY NAMED TO WORLD'S MOST HIGHLY CITED RESEARCHERS LIST



PROPOSAL SUCCESS RATE



PATENTS ISSUED

PUBLICATIONS (JOURNAL ARTICLES,

\$24.4m **IN ACTIVE GRANTS**

AND CONTRACTS

173,717 173,717 **RESIDENTS REACHED THROUGH EXTENSION PROGRAMS AND EVENTS**

(Extension stats based on calendar year 2022 totals)

18ĸ 4-H PARTICIPANTS

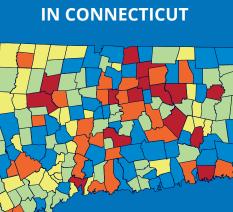
BULLETINS, FACT SHEETS)

\$**5.2**M **\$**

1,481



EXTENSION PROGRAMS



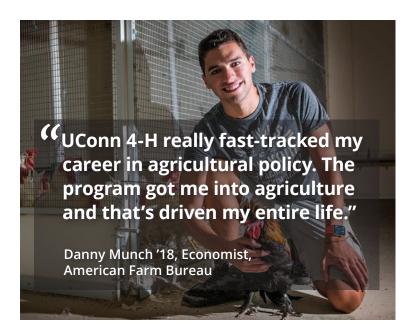




SPEAKING OF CAHNR

(([Hosting CAHNR student interns] really helps us to keep that talent pool full because that's how we're going to drive innovation."

Kushal Chandak, Vice President of Research and Development, PURIS Foods



The information students are given through the Diagnostic Genetic Sciences program sets us up for successful careers in genetics."

Kira Dineen '17, Genetic Counselor and Host of Award-Winning Podcast, DNA Today



How many schools are there that not only have a great ice cream place, but also let students take a class where you get to make ice cream for that great ice cream place?"

Charlie Parchen, Animal Science Student

In the agricultural community, we are talking a lot about climate smart agriculture and climate resilient agriculture. CAHNR plays a crucial role in that effort—research and development, outreach, and working with the farmers on implementation."

There's so much research coming out on genetics, environment, food, activity, and lifestyle. There's always something new to learn."

Christine Updegraff, Masters of Personalized Nutrition Student



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StrategicVision

Exploring the connections between food, natural resources, and human and animal health for a more sustainable future.

ENSURING SUSTAINABLE AGRICULTURE AND FOOD SUPPLY

From tackling food insecurity to maintaining a vibrant agricultural economy in Connecticut, we work to keep our food supply sustainable and our economic engine firing on all cylinders.

ENHANCING GLOBAL HEALTH

Human, animal, and environmental health are all connected. By taking a One Health approach, we work to promote health and prevent disease at the local, national, and global levels.

PROMOTING DIVERSITY, EQUITY, INCLUSION, AND JUSTICE

We recognize that systems have historically privileged some and harmed others. We are dedicated to working together to build a welcoming, equitable community where all can thrive.

FOSTERING SUSTAINABLE LANDSCAPES

Whether rural, urban, or somewhere in between, we work to develop environmentally aware residents who support healthy lifestyles and ecosystems.

ADVANCING CLIMATE ADAPTATION AND RESILIENCE

Climate change represents a threat to us all, from more extreme storms to severe droughts and the prevalence of invasive species. We work with stakeholders to create and maintain a sustainable environment and robust economy for current and future generations.

Sustainable Agriculture

Ensuring a Vibrant and Sustainable Agricultural Industry and Food Supply



Blue Plate Special

Sugar kelp from Connecticut's waters is on the menu.

A team from UConn Extension and Connecticut Sea Grant is using innovative research and community outreach to help make seaweed more accessible for consumers and more profitable for producers.

Anoushka Concepcion, associate extension educator, and other UConn researchers, used their knowledge of the seaweed life cycle to make sugar kelp farming in Connecticut possible.

Sugar kelp, a type of seaweed, is a versatile, environmentally friendly, nutritious crop that is a popular food elsewhere in the world. But before it could be sold in Connecticut, it had to overcome regulatory barriers.

"Part of our job with Extension is adapting to the emerging needs of our stakeholders," says Concepcion. "We're making sure public health officials and farmers have the information they need about what successful seaweed farming looks like in Connecticut."

The Connecticut Department of Agriculture's Bureau of Aguaculture partnered with Connecticut Sea Grant, securing federal grants in 2013 and 2015, to identify potential seaweed food safety hazards. This project resulted in the nation's first publication on seaweed food safety hazards. The publication is referenced internationally as a model.

Conception has since received funding from the National Oceanic and Atmospheric Administration to create a National Seaweed Hub. She also serves on the Steering Committee for the Safe Seaweed Coalition, a global partnership supported by the United Nation's Global Compact.

Connecticut is now a national leader in sugar kelp farming and industry growth, although Concepcion notes that there is still work to be done.

"The industry is still small and facing some challenges, but we're going to continue working to get sugar kelp on the menu in more homes and restaurants," Conception says. \"

Sustainable Agriculture



Soil Research Center Addresses Industry Needs

Precision agriculture can be a dirty business. The new Center for Soil Technologies (SoilTech), formed in partnership between CAHNR UConn's College of Engineering, is driven by industry need and supports the development of prototypes for commercialization.

The interdisciplinary work connects technology with education. Yu Li and Baikun Li in the College of Engineering developed a hydrogel that enables sensors to collect accurate readings of soil nutrients.

This innovation supports the development of precision agriculture, an approach of applying fertilizers or biological controls (like pesticides) only in the areas that need it, when they need it. This decreases the accumulation of dangerous chemicals, promotes plant health, and saves farmers money.

Haiying Tao, assistant professor of soil nutrient management and soil health, will work with local farmers to teach them how to use the sensors to implement precision agriculture.

"This collaboration could help uncover soil conditions that give rise to pests and provide guidance for better management practices. This takes much of the guess work out for farmers," says Tao.

These projects will also establish a pipeline connecting well-trained students and postdocs with this growing industry.

Merging Local Roots with Global Perspective

Established in the 1950s, CAHNR's meat science program teaches students about Connecticut's unique industry profile while providing them with the skills to work anywhere.

"It's very important that students have a basic sense about meat production that they get in the classroom, and at the same time they can start to form connections and be exposed to those industries," says Chaoyu Zhai, assistant professor of animal science.

The meat science program teaches students about the features unique to Connecticut's smaller-scale meat industry in a wider national and global context. Students also learn the science of how genetics and environmental factors impact the final meat product. The breed, climate, feed, management, and other variables all play a role that are incorporated into students' educational experience.

"Everything that we do at UConn is about integrating science and industry and preparing students for a career anywhere along that spectrum," says Zhai. "The program continues to evolve to meet student and business needs."



"Everything that we do at UConn is about integrating science and industry and preparing students for a career anywhere along that spectrum."



Enhancing Health

Enhancing Health and Well-being Locally, Nationally, and Globally

Part-Time Perfection

Weight loss is possible, even without perfect food tracking.

Keeping track of everything you eat and drink is a tedious task that can be hard to maintain over time. However, a new study finds that perfect tracking is not needed to achieve significant weight loss.

The research team, which included Professor Sherry Pagoto and Assistant Professor Ran Xu in CAHNR's Department of Allied Health Sciences, tracked weight loss program participants for six months as they self-reported food intake.

The researchers partnered with Weight Watchers as the company launched a new personalized approach to assigning points and tracking food intake.

"Dietary tracking is a cornerstone of all weight loss interventions, and it tends to be the biggest predictor of outcomes," Pagoto says.

The researchers found that when people tracked food for 30% of days, they lost more than 3% of their

weight. When they tracked 40%, this percentage rose to 5%, and 10% when tracking 70% of days.

"The key point here is that you don't need to track every day to lose a clinically significant amount of weight," Xu says.

This is promising since the goal for a six-month weight loss program is typically 5% to 10%, a range where health benefits have been seen in clinical trials including changes to blood pressure, cholesterol, cardiovascular disease risk, and diabetes risk.

Digital interventions like the one at the center of this study provide researchers with previously unseen levels of insight into user behavior. This can lead to better-informed, personalized programming to achieve desired weight loss outcomes.



Enhancing Health

Passing the Local Food Test

The UConn Zwick Center for Food and Resource Policy released a report on Farm to School activities in Connecticut, focusing on local food procurement. Farm to School is a national program seeking to incorporate local products and raise awareness with children and families.

The study found that of the 149 Connecticut School Food Authorities (SFAs) who responded, 101 had purchased some form of "local" food in the past year, which could mean food coming from a certain radius of the school, from within the state, or within the region.

While these results indicate positive impact, many schools face challenges having the time, staff, and equipment to prepare produce, and to market it to students.

The Zwick team provided recommendations for improving schools' access to local foods. These include a central, accessible information repository about local food procurement, reaching out to large distributors who may already be purchasing locally, and improving schools' access to funding and equipment to prepare and store fresh produce.



Protecting Pork

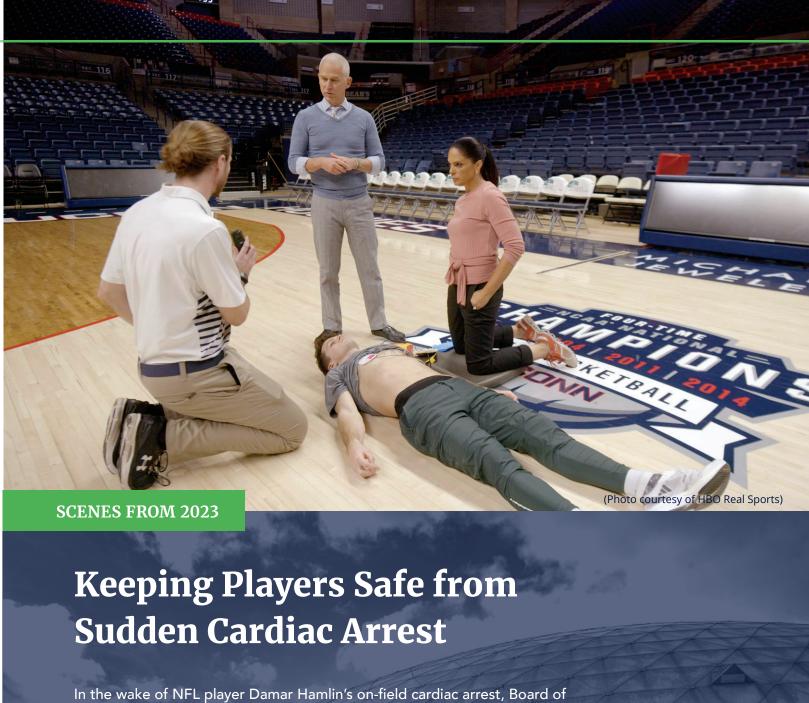
African swine fever (ASF), a virus that rapidly infects domestic and wild pigs, can decimate pork-producing economies.

In response to the virus's spread from its origins in sub-Saharan Africa to other continents, Guillermo Risatti, professor of pathobiology and director of the Connecticut Veterinary Medical Diagnostic Laboratory (CVMDL) and collaborators from the USDA, have developed a vaccine candidate deemed "promising" by independent researchers.

The vaccine candidate was recently licensed for commercial development by Zoetis, the world's largest animal pharmaceutical producer.

Researchers from Zoetis and the Friedrich-Loeffler-Institut (FLI) in Germany have conducted trials on wild boars using edible bait containing the vaccine, and on domestic pigs through a more traditional route—injection into the muscle. Both routes demonstrated the immunization's efficacy against ASF.

After years of failed attempts, the successful development of safe and effective modified live vaccines represents a new frontier in protecting swine from ASF.



In the wake of NFL player Damar Hamlin's on-field cardiac arrest, Board of Trustees Distinguished Professor of Kinesiology and CEO of CAHNR's Korey Stringer Institute (KSI) Douglas Casa discussed resources needed to save athletes' lives with HBO Real Sports and Soledad O'Brien. At a time when the whole world was watching, KSI continued to shine a light on the need for on-site, high quality medical care for all athletes, regardless of income, geography, level of competition, or any other factor. s.uconn.edu/cardiac

X GAMPEL PRVILION X

EAST ENTRY

Diversity, Equity, Inclusion, and Justice

Promoting Diversity, Equity, Inclusion, and Justice Through Anti-racist Approaches



From UConn to the USDA

The newly launched CAHNR Fellows Program connects undergrads from UConn's Hispanic-serving campuses to career opportunities in high-demand agriculture and health fields.

UConn Waterbury and UConn Stamford are pioneering the UConn Agriculture, Health and Natural Resources Fellows Program (or the CAHNR Fellows Program), designed to support underrepresented students in the fields of food, agriculture, natural resources, and human sciences. With \$4.5 million in funding from the U.S. Department of Agriculture's National Institute of Food and Agriculture (NIFA), the initiative will sponsor about 30 undergraduate student fellows in cohorts on both campuses.

"It gives students firsthand knowledge of what's required to have a career in those fields, and hopefully apply that classroom knowledge to real-life experiences," says Kristen Govoni, associate dean for

academic programs in CAHNR and co-director of the program.

"They will receive academic support, soft skills, and mentoring from peers, faculty, and staff. They will also have exposure to career opportunities within those fields."

Students will remain CAHNR
Fellows for four years, contingent on remaining a major in CAHNR or in a relevant career path. For Govoni, that's one of the most important benefits.

"It's supporting students from entering campus all the way through to job placement—it's not just one little piece."

Diversity, Equity, Inclusion, and Justice



Improving Community Health in Hartford

While Kristen Cooksey Stowers' office may be on UConn's main campus in Storrs, much of her research takes place about 30 miles to the west in the state's capitol, Hartford. Cooksey Stowers, assistant professor of allied health sciences, is collaborating with members of the community to expose structural challenges of healthy food access for marginalized populations.

A community's food environment can have a powerful impact on the health of its residents. If the food available is unhealthy and other barriers exist—such as racial, socioeconomic, and geographic disadvantages—it can produce diets that lead to health inequities for a community.

Cooksey Stowers utilizes Community-Based Participatory Research (CBPR) methods, working with stakeholders who live in the areas they are trying to help. Through this approach, Cooksey Stowers worked with the Invest Health Hartford Team to assess and improve the food environment in North Hartford.

Cooksey Stowers led a comprehensive audit of food stores and food swamp exposure. The results were displayed as an innovative Gallery Walk in the Hartford City Hall Atrium.

"The Gallery Walk highlights what makes the CBPR approach unique, creating a visual story with community partners to talk about the research rather than only publishing a paper in a journal read by academics. A part of this research is being a bridge and translator in the community."

The research has been instrumental for the Healthy Hartford Hub and the resident-led initiative focused on bringing a full-service grocery store to North Hartford.

"There is increased interest in equityrelated health research," says Cooksey Stowers. "There's a paradigm shift happening to do more CBPR, which is applicable in real world settings for practical interventions to improve health inequities and improve food accessibility and security."

One Size Doesn't Fit All

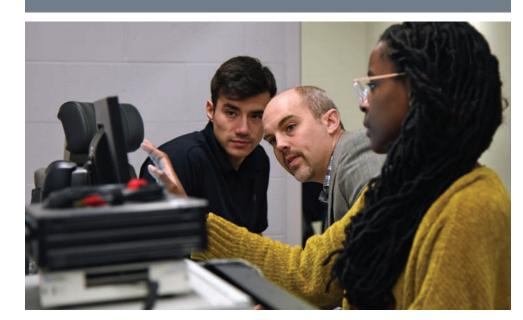
For decades, health care practitioners have used body mass index (BMI) as an indicator of a person's health. But this equation only considers height and weight, and may not accurately capture a person's risk for obesity-related diseases. It also doesn't take into account a patient's ethnic background, which may play a role.

Jacob Earp, assistant professor of kinesiology, developed a series of equations that use waist and hip circumference measurements to better predict how a person's fat is distributed within their body and accounts for known differences in ethnicity and sex.

Having more fat around the middle of your body is a greater health risk than having fat in other parts of the body. Additionally, fat distribution looks different between different ethnic populations and between women and men, influencing which interventions work best.

Using data from 12,000 full-body DXA scans, Earp's team found that Hispanic individuals are at a higher risk of poor fat distribution and its associated diseases. Men who are commonly classified as being either underweight or obese using BMI had unhealthier adipose tissue distribution than normally believed; the opposite was true for women.

"We know the obesity crisis is something we'll be facing for years to come. These tools help us better address a major health issue across a broad range of Americans," says Earp.



"We know the obesity crisis is something we'll be facing for years to come. These tools help us better address a major health issue across a broad range of Americans."



Sustainable Landscapes

Fostering Sustainable Landscapes Across Urban-rural Interfaces

Expanding the Climate Classroom

A unique mix of instruction, service learning, and extension to help Connecticut towns.

Through the Environment Corps (E-Corps) program at UConn, a collaborative effort between CAHNR, UConn Extension, Connecticut Sea Grant, and engineering faculty, students take their learning out of the classroom to help Connecticut communities invest in their climate futures.

Towns often have limited resources in terms of time and specialized knowledge when they want to start projects for sustainability or climate adaptation.

"We say that the E-Corps is built on putting together familiar aspects in an unusual way, in that we have a mix of classroom instruction, service learning, and extension outreach," says Emeritus Extension Educator Chester Arnold.

The E-Corps program model spans two semesters: the first is hands-on and classroom-based. Then students can pair with a community where they spend the second semester applying and building their skills by completing a project for the town or community partner.

Students help with research and assessment for grant applications, projects to help towns comply with stormwater management regulations, developing coastal resilience plans, and performing climate vulnerability assessments, to name just a few projects.

An impact report found that E-Corps graduates tend to pursue advanced degrees or careers in environmental fields, and that the program has influenced their interests in addressing environmental concerns as citizens.

"The ability to work directly with towns is invaluable and offers an avenue to interact with industry experts and relevant professionals which is fantastic for career development and making connections," Lilly Adamo '24 (CAHNR) says. "



Sustainable Landscapes

On the Prowl

UConn researchers have developed a model for tracking apex feline predators like mountain lions and bobcats in the wild. They are now using this model to track bobcats, the only wild cats in the state.

Professor Tom Meyer in the
Department of Natural Resources
and the Environment (NRE) has
been working on an interdisciplinary
team tracking mountain lions since
2010. The team is partnering with
Meyer's NRE colleague, Associate
Professor Tracy Rittenhouse and the
Connecticut Department of Energy
and Environmental Protection.

Feline predators live in remote areas and like to keep their distance from humans. Because of this, GPS tracking can provide unprecedented understanding of their lives.

The UConn team's model accounts for something other models miss—the fact that, just like house cats, feline predators spend a lot of time resting and sleeping.

The model can predict if an animal is resting or moving at a certain location at a specific time.



(Photo courtesy of Mark Elbroch)

"Apex predators are the lynchpins in our ecosystems, and having a good understanding of the realities of how the apex predators live their lives is crucial for understanding the proper and reasonable way to manage the ecosystems in which we live," Meyer says.

Mixing Personal and Professional

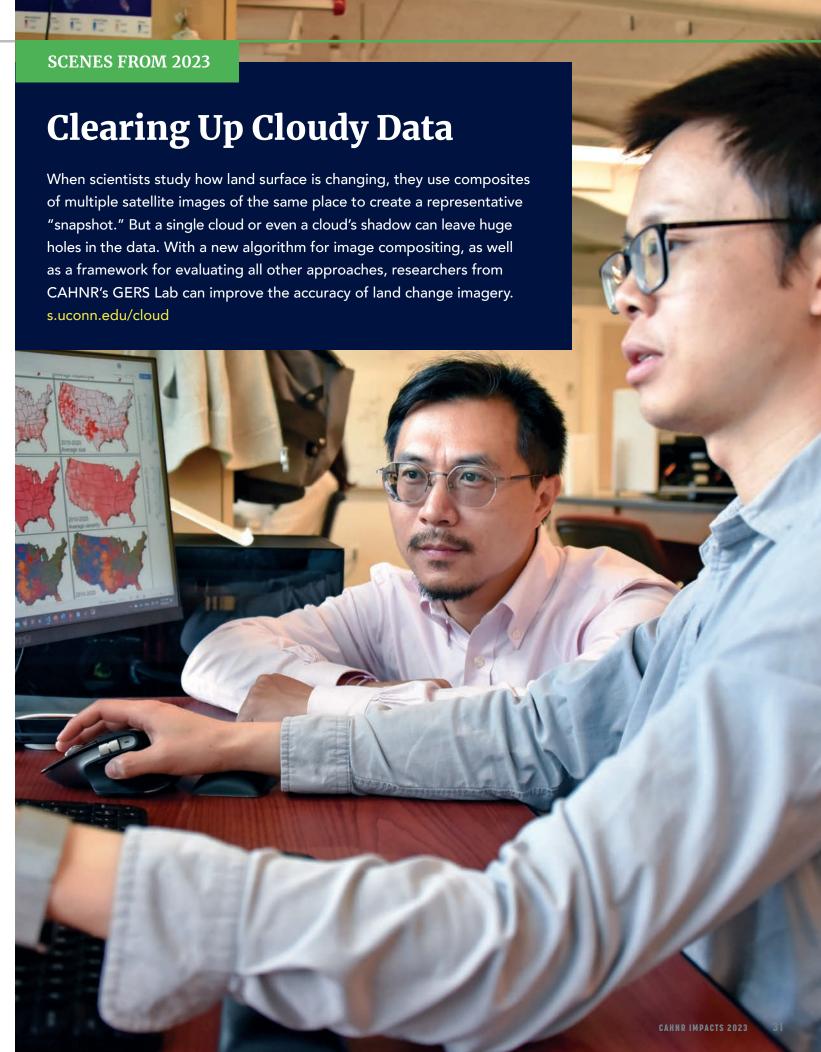
What do vacation homes have to do with farmland? Quite a bit, according to research from Charles Towe, associate professor of agricultural and resource economics. Towe found that recreational homes often remove land from the agricultural sector, or use it to produce low-quality commodities.

In the community Towe studied, Columbia County, New York, a quarter of agricultural parcels are owned by non-residents, people whose primary address is elsewhere. Towe found that 10-11% of agricultural land owned by non-residents is removed from the agricultural sector altogether. An additional 10-11% is used for low-value hay.

Since 2001, nonresident ownership of farmland in Columbia County increased by 22.7%. This may be related to the use value taxation credit New York state offers, which allows property owners to receive a break on their property taxes if they use part of their land for agricultural purposes.

In 2019, Towe completed a similar study for the Connecticut Department of Agriculture to evaluate Connecticut's Public Act 490 which provides tax breaks for agricultural land. Just like in New York, Towe found that, by far, the most common crop grown on farmlands the owner rented out was hay, around 40%.

"We're trying to make an economic link between the urban and rural communities because the country feels like it needs it," Towe says. "We're trying to identify the positive and negative impacts of being in this second home market."



Climate Adaptation and Resilience

Advancing Adaptation and Resilience in a Changing Climate



Seeding the Future

CAHNR researchers address native seed capacity by bolstering pollinators.

Native plants, species that are genetically adapted to the specific regions where they are used, are becoming a more popular choice for all kinds of landscaping. Because native plants have evolved with local climates and soil conditions, they generally require less maintenance once established and are hardier than non-native species. Native plants can help repair damaged landscapes, and slow climate change and species loss.

But there's one major problem: there aren't enough native seeds.

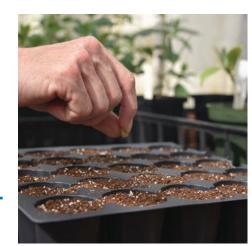
Working with the Northeast Seed Network, Professor of Horticulture Julia Kuzovkina is leading a project to increase native plantings and pollinator habitats along New England roadsides. John Campanelli, graduate student and founder of iConservation, developed the framework for selecting plant species that align with the region.

Currently, New England gets its seeds from other parts of the country with more robust agricultural infrastructure. Seeds acclimated to other climates may not do well once planted in New England.

The researchers are connecting private seed producers with local stakeholders to encourage the development of the region's ecotypic seed capacity.

"We're building greater coordination to promote expanded selections of affordable native seeds and make demand more predictable," Kuzovkina says. "Our ultimate goal is to help native plants, bees, and butterflies thrive along roads throughout New England."

The researchers are planting warmseason grasses and native flowers. Warm-season grasses have many advantages over cool-season grasses including less frequent mowing, providing habitat, reducing erosion, and drought tolerance.



Roadside flora performs ecosystem services like runoff filtration, carbon sequestration, supporting biodiverse habitats, and improving aesthetics. It also provides continuous migration pathways for pollinators. The project's three demonstration sites will be located along monarch butterflies' migration route.

"All native bees, all native pollinators will benefit from the roadsides," Kuzovkina says. WW

Climate Adaptation and Resilience



(Getty Photos)

Biochar and a Climate-Smart Future

CAHNR researcher Wei Ren is investigating how an innovative sustainable practice could position Connecticut at the forefront of climate-smart agriculture (CSA).

CSA is an integrative approach that aims to sustainably ensure crop yields while positively impacting people's livelihoods, enhancing soil health, building climate resilience, and mitigating greenhouse gas emissions.

Incorporating biochar into the mix has added benefits. Biochar is a charcoallike substance made from burning organic material like agricultural and forest waste.

"Across different soil and climate conditions, biochar, together with other practices, can help farmers to sustain food production. It can also reduce greenhouse gas emissions, reduce nitrogen leaching, and save soil water," says Yawen Huang, the study's lead author and a postdoctoral fellow supervised by Ren.

Using global data from hundreds of studies on the practice, its merits, challenges, and limitations, Ren's group formed a recommendation to use biochar more broadly.

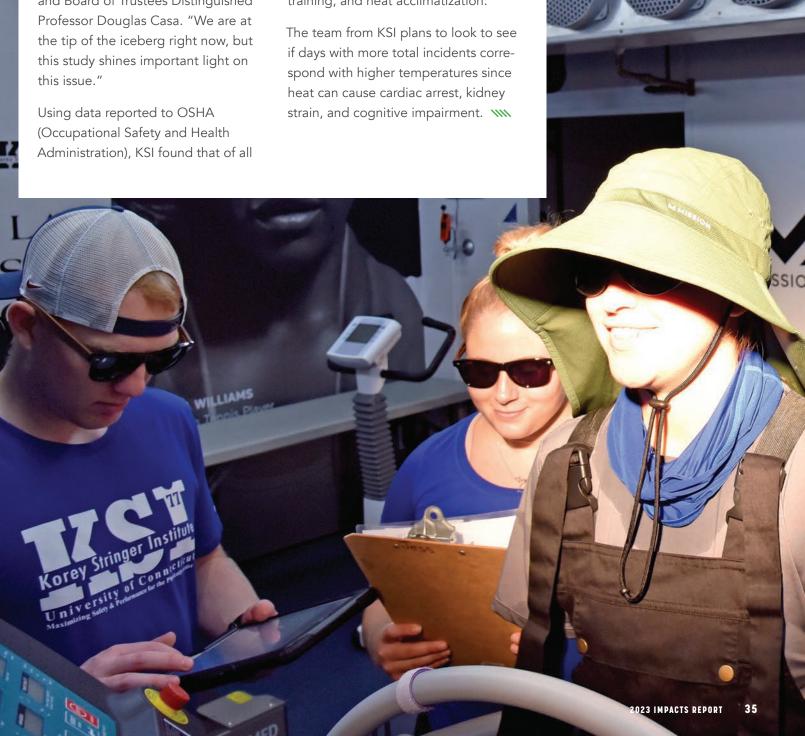
"We can achieve the goal of climatesmart agriculture, and in the case of biochar, Connecticut is an ideal place for exploring and applying biochar as a CSA approach," says Ren. 🐃

Beat the Heat

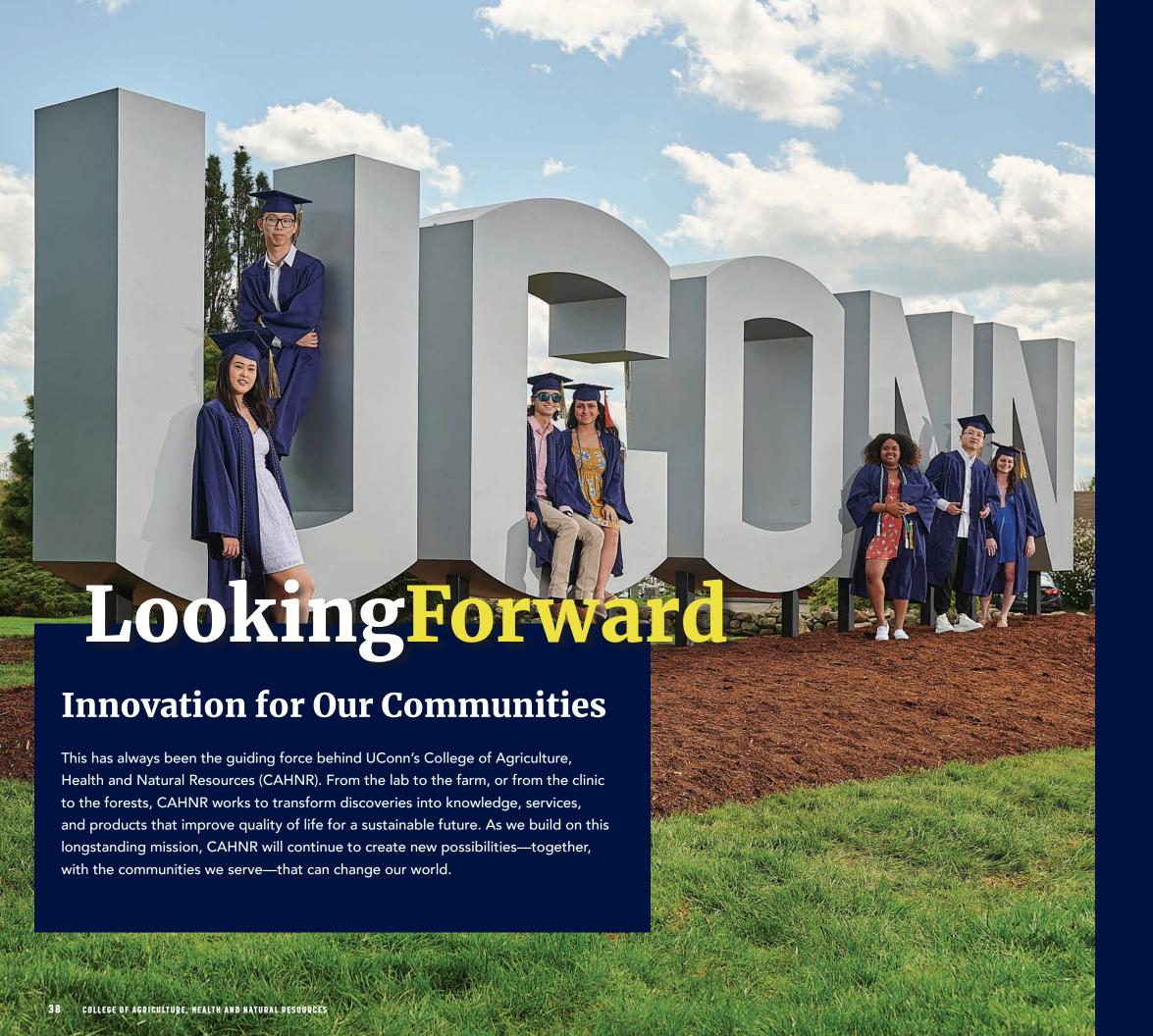
A team of researchers from CAHNR's Korey Stringer Institute (KSI) led and published a first-of-its-kind study that found heat is the number one cause of exertion-related injuries and fatalities on U.S. worksites.

"Without question, we can do much more to enhance heat safety for the laborer in America," says KSI CEO and Board of Trustees Distinguished injuries and fatalities that occurred on the worksite, about 3% were exertion related. Of that 3%, a staggering 89% were related to heat stress.

Casa hopes this study can help improve health and safety measures to protect workers with simple, low-cost measures like hydration, body cooling, environmental monitoring, educational training, and heat acclimatization.







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UCONN | COLLEGE OF AGRICULTURE, HEALTH AND NATURAL RESOURCES

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