SUSTAINING LIFE THROUGH DISCOVERY, LEARNING, AND ENGAGEMENT

Welcome to Waterman
GREETINGS.

As you are a vital part of The Ohio State University College of Food, Agricultural, and Environmental Sciences’ community, we want you to know a little more about what’s happening on the Columbus campus.

Right now, we are focusing on the Waterman Agricultural and Natural Resources Laboratory.

With an emphasis on learning by doing, Waterman extends the limits of the classroom from four walls to the entire outdoors and lets Ohio State and the community come together to take on critical challenges, such as the following:

- **Sustainability**: simultaneously ensuring viable agriculture production, food security and safety, and environmental and ecosystem sustainability.
- **One health**: studying the intersection or interaction among human, animal, and environmental health.
- **Rural-urban interface**: exploring the tensions and opportunities created in the communities, industries, policies, economies, and communications between rural and urban residents.
- **Leadership**: preparing the next generation of scientists and leaders.

Waterman is a unique facility that can serve as a core for teaching, research, and community engagement, while providing information to a broader audience. It will become a university hub for leading science and public engagement related to our food system, agriculture, and natural resources; as well as a center where many of our partners can join us to advance knowledge and industry, communicate about science, and prepare future leaders.

What’s happening on these 261 acres is key to the future of the college, the university, Ohio, and the world. This publication offers some insight into where we’re headed, how we’re getting there, and what you can expect in the next few years. We are excited about the potential for Waterman, the momentum it can generate, and the opportunities it will offer. Hopefully, our enthusiasm is contagious.

Thank you.

Cathann A. Kress
Vice President for Agricultural Administration and Dean, College of Food, Agricultural, and Environmental Sciences
The treasure is hidden in plain sight. It’s easy to miss, sitting a mere five miles from the Ohio Statehouse in downtown Columbus, which is now the nation’s 14th largest city. Commuters passing daily along West Lane Avenue might take notice of the Schottenstein Center or look to catch a glimpse of Ohio Stadium, not recognizing the Waterman Agricultural and Natural Resources Laboratory. Those motorists probably do not fully understand what goes on at Waterman. They see cornfields, maybe some cattle. Maybe they think it’s just a park. We see a whole lot more.

Waterman showcases the CFAES mission. We sustain life. In 1923, Anna M. Waterman was offered $150,000 for her farmland. Instead, she sold it to Ohio State for $100,000 to keep the property in agriculture. Currently, Waterman is a place for research, outreach, and education in the areas of production agriculture, animal sciences, entomology, crop science, and natural resources. Students run their own farm. Dairy cows are milked twice daily. Subjects such as turfgrass science and honey bee research are taught and studied. Cancer survivors grow and harvest nutritional produce. For many students in grades K–12, Waterman is their first experience on a real working farm. While touring the grounds on a covered wagon, they can experience 100 dairy cows feeding and socializing in a pasture before getting milked. They can also see plots of corn and soybeans, as well as apple orchards and berry bushes. With a stream, a forested woodlot, green pastures, and tillable land, the 261-acre site has diverse natural features that provide the perfect backdrop for experiential learning and innovative discovery in the 21st century.

“Without the Waterman Agricultural and Natural Resources Laboratory, we do not have a comprehensive university,” said Graham Cochran, CFAES professor and associate dean for operations. “Access on campus to Waterman is critical and just as important for our work as an operating room or testing labs for colleagues in medicine and engineering.”

With the help of two recent, significant gifts—one from Pat Brundige and one from Nationwide—Waterman is transforming into a place where the college can better build community and provide trusted scientific information in order to address global challenges today and in the future. This major investment from the college and its philanthropic partners will help ensure more qualified students, better equipped researchers, and a well-informed general public.

“At the Waterman complex, people will get the opportunity to learn more about what they are consuming every day,” Associate Professor of Plant Pathology Chris Taylor said. “It’s important to be up front and give people expert knowledge about what goes into the system to help them make the decisions about where they buy their food.”

The vision for Waterman is that of a showcase and hub of experiential learning and innovative discovery in the areas of food, agricultural, and environmental sciences, where people build community and connect to trusted information.

Without the Waterman Agricultural and Natural Resources Laboratory, we do not have a comprehensive university.

Graham Cochran, CFAES professor and associate dean for operations

A UNIQUE ASSET FOR SCIENTIFIC DISCOVERY AND MORE

The existing dairy farm will be modernized, and three new cutting-edge facilities will be built:

The Kunz-Brundige Franklin County Extension Building, upon completion in 2019, will contain the new Franklin County office of Ohio State University Extension—which provides outreach for the college—as well as a teaching kitchen and demonstration gardens.

The Controlled Environment Food Production Research Complex, which is slated to start construction in 2019, will enable cutting-edge, indoor food production research for the benefit of the world.

A multispecies animal learning center focused on human-animal interaction will offer hands-on learning for students and the public across all species including companion animals, horses, and livestock.
Annually, more than 12,000 youth participate in enrichment programs and more than 6,000 adults learn about agriculture and natural resources-related topics.
FEEDING THE FUTURE

Agriculture has made a lot of strides in the last 40 years, but more work must be done if we are to continue to feed a growing population with less available prime farmland. Doing so will require multiple solutions using new science and technology.

Those solutions will be explored in the Controlled Environment Food Production Research Complex, a project with a state-of-the-art greenhouse that, for some, represents a viable alternative approach to farming.

A transformational gift from Nationwide funded a feasibility study and is supporting construction of the complex: "We are so appreciative of our anchor partner, Nationwide, and look forward to what the future holds for our partnership," said Dean Kress.

Invariably, greenhouses are becoming more prevalent worldwide, and people will need to learn how to run them, Associate Professor of Plant Pathology Chris Taylor said. "There is a need to figure out how we can take it to the next level. That's where this greenhouse fits in," Taylor said.

"You need to change the next generation to being proficient in being able to manage and operate these facilities," he said. "We see it. It is coming, and we need to make sure Ohio State is at the forefront to provide the talent and know-how to position people for this industry so they will be successful for food production."

A greenhouse production system can potentially produce 10 times the yield in the same square-foot area as outdoor land, Taylor said, because crops are grown year-round in a closed structure that protects them from winds, hail, and pests.

Chieri Kubota, professor in the CFAES Department of Horticulture and Crop Science, predicts that controlled environment indoor crop production will feed the future. "Controlled environment was originally designated to do intensive production close to cities where people live," Kubota said. "That model is making more and more sense. This way, the food you eat is part of the community, part of the vision. People see where the food is from and who is growing it."

The public should be able to know everything about their produce, she said. "And it would be nice to be able to thank the farmer in person."

Kubota said the 2018 E. coli outbreak involving romaine lettuce would have been much better contained in a controlled environment, where it is easier to identify the supply chain and thus isolate the suspected source without massive recalls.

With controlled environment, "food can potentially be more nutritious and flavorful," she said.

Traditionally, produce has been bred with an emphasis on a longer shelf life and a resistance to pesticides, Kubota said. But if food is grown closer to where it is served, "the breeding becomes focused more on flavor and nutrition rather than shelf life."

Controlled environment better allows people to take advantage of smart agriculture via the use of technology: controlling expected sunlight, water, energy, and other resources with a computational approach, she said.

A greenhouse production system can potentially produce 10 times the yield in the same square-foot area as outdoor land, because crops are grown year-round in a closed structure that protects them from winds, hail, and pests.
A HANDS-ON APPROACH TO LEARNING ABOUT ANIMALS

The multispecies animal learning center will bring people and animals together for hands-on learning, public events, and Extension programming. Practicing and teaching precision agriculture in animal production are among the motivations behind the center. So is having an appropriate setting for public discussions and research involving animal welfare, food production, and pet care.

“Society’s relationship with animals is really complicated,” said John C. Foltz, chair of the CFAES Department of Animal Sciences. “We hope the new multispecies animal learning center will provide insights into teaching, research, and outreach.”

When the center is completed in 2021, Waterman will have dairy cattle, horses, swine, and poultry year-round, with the capacity to house beef cattle, sheep, and goats as needed.

Alongside the renovation of the Waterman dairy farm, the learning center will have viewing areas and interactive displays to demonstrate how “technology can play a role in better animal care and better management,” Foltz said.

“The public can come in and see animals. There will be signs, some informational displays, some video feeds,” he said. “I hope when people see this they get excited. They say, ‘Wow. This is not the farming that I anticipated.’”

Technology will be a primary focus of the center’s design, Foltz said, and this might include video equipment for tracking animal behavior, live video feeds to visitors, and research demonstrations of virtual fencing, among others. The dairy renovation, with a $900,000 needed investment, will result in a 24-hour viewing area and a robotic, voluntary milking station to show that technology offers a more sustainable, food-secure, and animal-friendly future. Currently, cows are milked twice daily. But the voluntary milking station will allow them to come in when they are ready. It will feed them while they’re there and will allow data collection for better analytics and earlier mastitis detection, Foltz said.

“Our students will be learning different things,” Foltz said. “They won’t just be milking cows. They will be learning how to better manage the cows using the data that the system provides.”

“Students place the highest value on being able to apply what they have learned,” said Jack Korenyi-Both, a third-year animal sciences major with a focus on poultry science.

“What’s huge is the difference between sitting in a lecture and just hearing or seeing what it’s about and actually getting hands-on experience in an industry application situation,” he said.

Visits to Waterman as a freshman, along with a poultry project at Ohio State’s Wooster campus inspired Korenyi-Both, he said.

“I didn’t grow up in a super-rural or really agricultural area. This was one of my first exposures to a dairy operation, and it sparked a general interest in agriculture,” said Korenyi-Both, who is involved in the Poultry Science Club; the Animal Science Community Alliance; the FarmHouse Fraternity, Alpha Tau Zeta Chapter; and the CFAES Ambassadors program. “That first semester sparked me down this path, and I am grateful for it.”

“Students place the highest value on being able to apply what they have learned.”

Jack Korenyi-Both, third-year animal sciences major.
A WIDE VARIETY OF ACTIVITY AND OPPORTUNITY

In addition to its existing and future facilities, Waterman is also home to the Garden of Hope, a 2.5-acre garden where cancer survivors treated at Ohio State and elsewhere harvest fresh produce regularly to promote healthy diets and reduce the risk of cancer complications. The program is a collaboration of Ohio State’s Comprehensive Cancer Center, College of Medicine, the JamesCare for Life program, and CFAES.

Cancer survivors have a chance to get in touch with nature, practice healthier eating habits, and inspire one another, along with the student volunteers in the garden.

Waterman also houses the Rothenbuhler Honey Bee Research Laboratory, which focuses on entomology, specifically on honey bees. Undergraduate students who work in the lab experience the practical matters of beekeeping and do molecular research. A spring-semester beekeeping class gives students a hands-on experience with the facility’s dozen beehives.

The research program on honey bees is currently focused on determining the plants in urban and rural environments that are most beneficial for bees. Researchers are sequencing DNA found in honey and pollen to identify the plants that bees are visiting to collect food. This work has identified soybeans as an important nectar source, and research is being undertaken to determine not only the importance of soybeans for honey production in Ohio, but also the potential of bee pollination to increase soybean yield.

The honey bee lab also houses the OSU Extension entomology program in vegetable and fruit crops, which makes extensive use of the 2-acre apple orchard as well as the variety of vegetables grown at Waterman. Several entomology graduate students have thesis projects based at the lab, and several undergraduate student workers are employed to assist in research and Extension projects based at the lab. A current focus is on developing management tactics for the brown marmorated stink bug, a new pest that is attacking many crops as well as being a nuisance pest inside structures.

In addition, hundreds of turfgrass professionals come annually to learn about the latest trends at research field days, workshops, product demonstrations, and tours at Waterman’s Ohio Turfgrass Foundation Research and Education Facility. The 23-acre site allows CFAES faculty to conduct experiments in agronomy, plant pathology, entomology, and natural resources. The facility offers tactile learning opportunities to Ohio State students studying the sciences necessary to care for and manage golf courses, sports fields, parkland, and lawns of all sizes.

Research is being undertaken to determine not only the importance of soybeans for honey production in Ohio, but also the potential of bee pollination to increase soybean yield.
Our goal is to have every undergraduate student step foot on Waterman during his or her time at Ohio State, whether a part of curriculum, a research lab, or a volunteer opportunity.

OHIO STATE’S LIFE-SUSTAINING LEARNING LAB

Our hope is that this treasure will no longer be hidden from the road, and that passing motorists will recognize the need for viable agriculture that can produce secure food systems in a sustainable environment. It will be clear that there exists one health, encompassing humans, animals, plants, and the environment. Waterman will be seen as a place where the tension and opportunities within urban and rural communities are explored to the mutual benefit of all. And lastly, those motorists will recognize that Ohio State is stepping up to address these challenges as it prepares the next generation of scientists and leaders.

Furthermore, Waterman will engage as many youth and students across the university as possible so that they can learn more about food, agriculture, and natural resources. Our goal is to have every undergraduate student step foot on Waterman during his or her time at Ohio State, whether a part of curriculum, a research lab, or a volunteer opportunity.

For those who already see this treasure, please keep watching as the Waterman Agricultural and Natural Resources Laboratory grows in value and stature for CFAES, Ohio State, the community at large, and the world.
JOIN US

This is a remarkable time for Waterman, the college, and the university. We hope you will join in on the excitement.

**Tour the dairy:**
Visit the Waterman dairy tour page at [go.osu.edu/dairytour](http://go.osu.edu/dairytour) to schedule a tour. Just click on the tour request form. Limited space will be made available, and we will do our best to accommodate your schedule.

**Share a memory:**
If you have a personal or professional remembrance of your time at Waterman, please send that story and any photos to [faesdevcom@osu.edu](mailto:faesdevcom@osu.edu).

**Stay up to date:**
Send an email to [faesdevcom@osu.edu](mailto:faesdevcom@osu.edu) to get the latest developments on Waterman.

**Talk to someone about supporting:**
Call the CFAES Office of Advancement at 614-292-0473.

**Tell us what you think:**
Call 614-292-0473 or email your thoughts to [faesdevcom@osu.edu](mailto:faesdevcom@osu.edu).

Learn more:
Go to [go.osu.edu/waterman](http://go.osu.edu/waterman).

CFAES provides research and related educational programs to clientele on a nondiscriminatory basis. For more information, visit cfaesdiversity.osu.edu. For an accessible format of this publication, visit cfaes.osu.edu/accessibility.