ANNUAL REPORT FY25

Sustainability Institute

The Ohio State University



THE OHIO STATE UNIVERSITY

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Cover photo: Scene from Calling Hours

Developed by Ohio State faculty Jeffrey Jacquet and Tom Dugdale, *Calling Hours* is a theatrical requiem performance written to express the impact of the retirement of the Conesville coal-fired power plant on the community of Coshocton County. The Sustainability Institute provided the initial research grant for the rural community study that collected the stories associated with the plant retirement and supported the theatrical production in numerous ways.

Our Mission

The Sustainability Institute integrates, supports and leads sustainability across the university enterprise in ways that:

PROMOTE sustainability and resilience teaching and learning that are integrated across colleges and inclusive of various disciplines and ideas

CATALYZE interdisciplinary research that drives discovery and innovations in sustainable and resilient systems, technologies, policies and actions

ENGAGE public and private sector partners in Ohio, the nation and around the world to develop and apply sustainable solutions that improve well being

INTEGRATE sustainability scholarship with campus activities, including opportunities for students from a variety of disciplines to engage in research and experiential learning using the campus as a living laboratory and test bed

PROVIDE s a competitive advantage in attracting exceptional new talent, students, partnerships and resource investments to the university

Building a more sustainable and resilient future for all

Message from the Director

IT IS A PLEASURE TO SHARE this annual report highlighting the work and accomplishments of the Sustainability Institute in FY25 (July 1, 2024, to June 30, 2025). Although this year has been marked by significant transitions, our work to advance sustainability has continued uninterrupted to meet the needs of the communities we serve.

Many businesses continue to pursue sustainability goals because these targets can reduce costs, attract talent and deepen customer loyalty. This drives demand across many sectors for workers with sustainability knowledge and skills. And communities in Ohio and beyond are striving to find ways to live more sustainably, ensuring a better world for their residents now and into the future.

With more than 800 faculty engaged in sustainability from across its 15 colleges and multiple campuses, Ohio State is advancing sustainability research and education that span natural, social, health, and engineering sciences, arts and humanities, and the professions. The Sustainability Institute is committed to working together with faculty from across the university and the private, public and non-profit sectors.

One highlight is a new $10 million award from the U.S. Department of Agriculture to work with farmers in the Midwest to advance research on land-based carbon sequestration. The multi-institutional proposal, led by Ohio State and supported by the Sustainability Institute, focuses on developing integrated economic, environmental, and biophysical models using AI and machine learning tools to help farmers make decisions that balance profit, carbon storage, and water quality.

We also marked the launch of a Sustainability Pedagogy Learning Community for faculty and instructors, in which the cohort explored innovative approaches to design and integrate new learning experiences into their curricula.

I am also proud of the role that the Sustainability Institute played in the effort that led to the production of *Calling Hours*, a performance that explored the lasting impacts that the closure of a coal-fired power plant had on an Ohio community.

Many people contributed to our success. I would be remiss if I did not acknowledge Kate Bartter, the Sustainability Institute's co-founder and Executive Director, who closed her 18-year career at Ohio State. We will miss her leadership and enthusiasm for our work.

Finally, our deep thanks to stakeholders like you. Together, we can apply the science of sustainability to improve our quality of life.



Elena Irwin, Sustainability Institute Director & Distinguished University Professor



Goal 1

Establish Ohio State as a Leading Public Institution of Sustainability Research and Applications

By the numbers

- $53.7 million in externally funded sustainability research awards
- 361 faculty and researchers affiliated with the Sustainability Institute
- More than $280,000 in research seed grants awarded by the Sustainability Institute

THE SUSTAINABILITY INSTITUTE (SI) FOSTERS TRANSDICIPLINARY RESEARCH by catalyzing and connecting research teams across its affiliate community representing 361 faculty and researchers from 12 colleges and four campuses. Collectively, these affiliates pursued 412 external sustainability research project proposals. Of those proposals, 118 were funded, bringing in $53.7 million in externally funded sustainability research to Ohio State. SI directly supported many of these proposals in many ways, including writing portions of grant proposals, recruiting research partners and connecting researchers to external resources.

Land-Based Carbon Sequestration

ONE RESEARCH HIGHLIGHT was an award to advance land-based carbon sequestration. An interdisciplinary research team consisting of six universities and led by Ohio State won a $10 million grant from the U.S. Department of Agriculture to translate the science of soil organic carbon sequestration and farmer behavior focused on Midwestern agricultural fields. The research team will develop extension and educational resources that quantify the economic and environmental benefits. The integrated research, extension, and education activities will be co-produced with stakeholders representing diverse perspectives among the private, public and non-governmental organization sectors.

Known as a Sustainable Agriculture Systems grant, the funding will support the creation of a multi-scale integrated model enabled through machine learning; an expanded conservation management decision support tool to quantify trade-offs, synergies, and risks; a virtual policy scenario dashboard; an undergraduate STEM research experience; a transdisciplinary graduate training program; and an online carbon science and policy certification program.

SI Director Elena Irwin co-authored the proposal with the project's PI, Brent Sohngen, Professor in the Department of Agricultural, Environmental, and Development Economics and an SI affiliate.

SI Research Seed Grants

SI MADE TARGETED INVESTMENTS IN RESEARCH to support ten projects led by Ohio State faculty through its annual research seed grant program. Examples include:

Climate Resilience in Dairy Farming

Led by Grazyne Tresoldi, Assistant Professor in the Department of Animal Sciences, this project investigates barriers and best practices to heat stress management to protect cow health, focusing on weather impacts and perceptions and decisions of dairy farmers that can help inform improved practices and adaptation strategies.

Research collaborators include Cara Lawson, Assistant Professor in the Department of Agricultural Communication, Education, and Leadership; Jennifer TyreeHageman, Lecturer in the Department of Management at the University of Birmingham, UK; and Israel Obadare, Graduate Research Associate in the Department of Animal Science.

Tangled Threads

Ohio State's Environmental History Initiative and external collaborators are creating a documentary film series that investigates the evolution of the global fashion industry, highlighting six critical milestones of its history. Dubbed *Tangled* Threads, the film series will

explore how clothing production became such a threat to our global environment as a source of waste and pollution.

Led by Nicholas Breyfogle, Professor in the Department of History, the research team includes Tasha Lewis, Associate Professor -Clinical in the Department of Human Sciences; Bartow Elmore, Professor in the Department of History; Brett Langolf, Filmmaker and Founder of the ContentEXP Group (CXG); and Lisa Goldsand, Founder of Circular Thrift.

On-site SMRs for Emissions Reductions

This project will explore the benefits and feasibility of co-locating small and micro modular nuclear reactors (SMRs) and fuel enrichment plants to reduce carbon emissions, enhance energy efficiency and strengthen climate resilience. This study will also identify knowledge gaps in SMR environmental and public impacts, safety risks, and economic viability of co-location.

Carol Smidts, Professor in the Department of Mechanical and Aerospace Engineering, will lead this project along with Taiyang Zhang, Assistant Professor in the Department of Mechanical and Aerospace Engineering.



Goal 2

Educate and Empower Ohio State Students to Become Leaders, Professionals and Engaged Citizens

By the numbers

- 15 faculty participants in first cohort of Foundations of Sustainability Pedagogy Faculty Learning Community program
- 44 student engagement events facilitated by the Sustainability Institute
- 10 student sustainability grants awarded totaling nearly $40,000

THE SUSTAINABILITY INSTITUTE (SI) SUPPORTS EDUCATION AND WORKFORCE DEVELOPMENT opportunities for Ohio State students and professionals with an emphasis on new learning opportunities in the classroom and experiential learning. Our efforts reach thousands of students and hundreds of instructors across the university.

Sustainability Learning Community for Faculty and Instructors

IN FY25, THE SUSTAINABILITY PEDAGOGY LEARNING COMMUNITY LAUNCHED thanks to the efforts of

the SI-facilitated Sustainability Education and Learning Committee and in partnership with the Michael V. Drake Institute for Teaching and Learning. This new learning community for faculty and instuctors welcomed its first cohort of 18 faculty members.

The Sustainability Pedagogy Learning Community helped faculty representing the range of disciplines across the university in multiple ways. Cohort members explored innovative approaches to the pedagogy of sustainability to design and integrate new learning experiences into Ohio State's General Education program and their respective disciplinary curricula. The learning community members met regularly throughout the autumn and spring semesters, working together to identify common obstacles to effective teaching, analyzing best practices, and developing a set of core competencies for sustainability learning.

The Ohio State EmPOWERment Program

LAUNCHED IN 2019, THE OHIO STATE EMPOWERMENT PROGRAM set out to equip an interdisciplinary cohort of doctoral students to drive transformative change in sustainable energy systems. Supported by the National Science Foundation as part of the National Research Traineeship initiative, 500 students have participated in the program's different initiatives through 2025.

The curricular centerpiece of EmPOWERment's training program is a 19-credit Graduate Interdisciplinary Specialization in Data-Driven Sustainable Energy Systems (DRIVES). As the EmPOWERment program draws to a close, DRIVES will continue to be available to all graduate students across the university. Two core courses—*Foundations of Data-Driven Sustainable Energy Systems* (cross-listed with six academic units) and the *Innovating for Sustainable Energy Systems* capstone—were also a direct result of the program.

STEAMM Rising

OHIO STATE HAS COLLABORATED with the City of Columbus, Columbus City Schools and Columbus State Community College (CSCC) to strengthen the alignment of STEAMM curricula (science, technology, engineering, art, mathematics and medicine) and career pathways for students in grades 11-12 and remove barriers to pursuing undergraduate studies in STEAMM fields.

In 2025, SI established a sustainability module for Columbus City Schools teachers to learn about sustainability topics and Ohio State's approach to sustainability and project-learning. The centerpiece of the event was a demonstration of the Living Waters living lab project, led by Amy Youngs, Associate Professor in the Department of Art, who developed the project through the Living Art and Ecology Lab to help bring a historic stream that once flowed through the Columbus campus back to life in a virtual reality environment.

SUSTAINS Living Learning Community

SI MANAGES THE SUSTAINS LIVING LEARNING COMMUNITY, in partnership with the Housing and Residence Education within the Office of Student Life. A cohort of sustainability-minded undergraduate students pursuing a variety of degrees across different disciplines live in community on the Columbus campus with dedicated sustainability coursework, project development, community service, and professional development events.

In 2025, SUSTAINS students implemented six projects, including a new garden site as part of the North Campus Container Garden project. SI also organized and led a professional development trip for the students over the university's fall break to Washington, D.C., to gain exposure to an array of sustainability career paths and seek career advice from sustainability professionals.

SI Student Grants

SI STUDENT GRANTS PROVIDE Ohio State students of any level and any discipline opportunities to lead and implement projects that improve university operations, engage communities, and foster sustainability living labs on campus and in communities. Up to $5,000 in funding is available per grant. In FY25, SI awarded funding to 10 proposals, totaling nearly $40,000 in awards.

Funded projects covered a range of sustainability topics such as urban agriculture, active transportation and rural clean water. One highlight included work by Food, Agricultural, and Biological Master's student Maggie Gottfried to address the lack of access to safe water in rural communities around the world. Gottfried is exploring gravity-powered water treatment plants. With support from Ohio State's Impact Lab and other student researchers, this project makes connections among non-profit organizations, community partners, and student-led research initiatives.



Goal 3

Accelerate Campus Sustainability Progress and Living Lab Opportunities

By the numbers

- 9 living lab projects supported by the Sustainability Institute
- More than $350,000 in funding directed toward living lab projects
- Living lab content successfully introduced into a new class

THE SUSTAINABILITY INSTITUTE (SI) PROMOTED LIVING LAB OPPORTUNITIES to help translate research and learning into practice. Ohio State's operational breadth and complexity enable living labs across a range of topics and disciplines. In FY25, SI supported the creation of nine new sustainability living lab projects at the university and the Wexner Medical Center. Three of these living labs are highlighted below.

A Prairie with Nine Rooms

KNOWLTON SCHOOL OF ARCHITECTURE FACULTY Katie Jenkins and Parker Sutton noticed an unutilized asphalt pad near The Ohio State University's Wexner Medical Center offices on

Ackerman Road and envisioned an outdoor classroom prairie for their landscape architecture students. With funding support from SI and a matching grant from the Office of Administration and Planning, Jenkins and Sutton collaborated with the university's Med Center; Planning, Architecture and Real Estate and Facilities Operations and Development to plan a new space their students could help shape with native plantings and learn how to incorporate sustainable landscape design into an existing urban environment.

Over fifty species of prairie plants make up the community of plantings in the restored soil where the asphalt has been removed, converting the site from an impervious hardscape into a stormwater sponge, helping to reduce water runoff. The project also incorporates the site's reclaimed asphalt as experimental "dry" gardens and utilizes fallen campus trees as seating throughout the project space, minimizing waste in the site design,

3D Printer Filament

3D PRINTING GENERATES SIGNIFICANT AMOUNTS OF PLASTIC WASTE. With a grant from SI, Center for Design and Manufacturing Excellence (CDME) undergraduate student employee and biomedical engineering major Lili Hurst developed a method to reprocess filament waste from 3D printing in a CDME lab for reuse. Hurst worked with CDME colleagues to procure equipment to refine reprocessing methods and collaborated with other university units to collect filament waste. A pilot project expanded to nine Columbus campus locations, two other universities, and three Columbus community locations. In total, the effort diverted hundreds of kilograms of filament waste from the landfill and use of the reprocessed filament by other student projects.

Conversations with Trees

OHIO STATE'S COLUMBUS CAMPUS FEATURES A DIVERSITY OF TREE SPECIES. With SI funding, Department of Design Associate Professor Peter Chan and his students studied the Columbus campus tree canopy to develop an interactive installation that educated visitors about the biological, economic and emotional benefits that trees provide. With collaboration from Ohio State's Chadwick Arboretum & Learning Gardens, Chan's students developed educational media productions for the class that highlighted the social importance of the tree species found on campus.

Chan went on to expand upon his students' work to develop an augmented reality twin of the Oval's tree canopy for a more immersive visitor experience known as "Conversations with Trees." The exhibit was shown in downtown Columbus, Ohio State's Marion campus and presented at San Diego Design Week, an international event showcasing creative design innovations.



Goal 4

Grow Resources Available to Support Sustainability and Resilience Research, Teaching, Outreach and Engagement

By the numbers

- Nearly $36.5 million raised from public and private sources for sustainability research
- Over $550,000 raised from external sources for sustainability teaching and learning
- Almost $20,000 raised from private sources for sustainable campus operations

THE SUSTAINABILITY INSTITUTE (SI) DEVELOPS AND EXPANDS STRATEGIC COLLABORATIONS with public, private, and nonprofit sector entities to accelerate research, strengthen educational and operational resources, and engage Ohio State's students, faculty, and staff to help solve sustainability challenges. This work includes identifying and securing funding resources to help drive innovation and projects.

Domestic Production of Natural Rubber

IN 2024, THE U.S. NATIONAL SCIENCE FOUNDATION AWARDED $26 MILLION to fund an Ohio State-led

Engineering Research Center known as the Transformation of American Rubber through Domestic Innovation for Supply Security (TARDISS). The goal of the center is to establish a domestic production system for natural rubber, relying on rubber-producing crops that can grow in North America, notably guayule and rubber dandelion. In addition to addressing geopolitical concerns around supply chains for natural rubber coming from plantations outside the United States, the research seeks to make sources of natural rubber more sustainable by lowering emissions from shipping, reducing biodiversity and habitat impacts in overseas tropical forests, and creating new markets for American farmers.

SI played a strategic role in helping to secure the grant by recruiting Goodyear Tire and Rubber as the largest industry partner for the project with a commitment of $1 million over five years. It continues to support the work by attracting additional industry members to the project and managing the center's industry advisory board.



Goal 5

Catalyze a Culture of Sustainability

By the numbers

- Nine sustainability events organized across campus
- 18 campus units received awards from the Sustainability Institute
- Increased website visitors to 20,000 and expanded social media to 5,000 engagements

THE SUSTAINABILITY INSTITUTE (SI) SEEKS TO CULTIVATE BROAD INTERSEST IN SUSTAINABILITY across campus and translate it into engagement and action. This includes hosting and supporting marquis events that help reach audiences beyond the university, providing opportunities to learn from others and share knowledge developed by Ohio State's faculty, staff and students.

Calling Hours

WHEN THE AEP CONESVILLE COAL-FIRED POWER PLANT CLOSED, the impact on the community of Coshocton County in eastern Ohio was profound. Jeffrey Jacquet, Associate

Professor of Rural Sociology with the School of Environment and Natural Resources, studies communities affected by coal-fired power plant retirements, including the community around the Conesville plant. He worked with Tom Dugdale, Associate Professor in the Department of Theatre, Film and Media Arts to produce *Calling Hours*, a theatrical requiem performance to convey the impact on the community from the closure of the plant.

Using local performers, *Calling Hours* was originally performed in Coshocton and then again at the Wexner Center for the Arts' Mershon Auditorium on Ohio State's Columbus campus. The Columbus campus performance was included as a component of the international *Conference on Global Coal Transitions* that was hosted on the Columbus campus that same week. SI provided the initial research grant that supported the rural community study and supported the two productions.

Passport to Earth Month

BUILDING ON THE STUDENT-PLANNED "TIME FOR CHANGE" WEEK, SI worked with Ohio State student and Columbus community organizations to amplify more than 50 sustainability-related events occurring on and near the Columbus campus during Earth Month - April 2025. The events included three SI-led webinars that brought faculty and external experts together to have casual conversations about trending sustainability topics.

- **GLOBAL WATER CHALLENGES:** John Cherry, Distinguished Emeritus Professor with the University of Waterloo, Groundwater Project founder and 2020 Stockholm Water Prize winner, joined Audrey Sawyer, Adjunct Professor with the School of Earth Sciences, to discuss worldwide challenges facing freshwater and what can be done to preserve this critical resource for future generations.
- **AGRICULTURE AND CLEAN ENERGY:** Sarah Moser, Senior Director and Head of Farm Operations and Agrivoltaics at Savion, joined Scott Shearer, Professor and Chair of the Department of Food, Agricultural and Biological Engineering, to discuss how clean energy projects can strengthen farming operations while reducing carbon footprints.
- **PUBLIC HEALTH AND CLIMATE CHANGE:** Bruce Bekkar, Chair Emeritus of the Public Health Advisory Council in Southern California and Climate for Health Fellow at ecoAmerica, joined Claire Bollinger, Director of Health Professions Sustainability Education for the College of Medicine and Instructor of Practice in Health Sciences in the School of Health and Rehabilitation Sciences, to explore the roles and responsibilities of health care practitioners in the fight against climate change.

Core Faculty

Yongyang Cai, Agricultural, Environmental, and Development Economics

Chen Chen, Integrated Systems Engineering

Zhenhua Chen, City and Regional Planning

Jordan Clark, Civil, Environmental, and Geodetic Engineering, *Joint Appointment with:* Food, Agricultural, and Biological Engineering

Karen Dannemiller, Civil, Environmental, and Geodetic Engineering, *Joint Appointment with:* Environmental Health Sciences

Scott Demyan, School of Environment and Natural Resources

Grant Donnelly, Marketing and Logistics

Sean Downey, Anthropology

Jennifer Eaglin, History

Bartow Elmore, History

Jonathan Fresnedo-Ramirez, Horticulture and Crop Science

Daniel Gingerich, Civil, Environmental, and Geodetic Engineering, *Joint Appointment with:* Integrated Systems Engineering

Matthew Hamilton, School of Environment and Natural Resources

John Horack, Mechanical and Aerospace Engineering, *Joint Appointment with:* Public Affairs

Huyen (TK) Le, Geography

Eden Lin, Philosophy

Yanlan Liu, School of Earth Sciences, *Joint Appointment with:* School of Environment and Natural Resources

Daniela Miteva, Agricultural, Environmental, and Development Economics

Joel Paulson, Chemical and Biomolecular Engineering

Judit Puskas, Food, Agricultural and Biological Engineering

Christopher Rea, Public Affairs

Christo Sevov, Chemistry and Biochemistry

Nicole Sintov, School of Environment and Natural Resources

Xiaoguang (William) Wang, Chemical and Biomolecular Engineering

Mark Weir, Environmental Health Sciences

Ryan Winston, Food, Agricultural and Biological Engineering, *Joint Appointment with:* Civil, Environmental, and Geodetic Engineering

Faculty Advisory Board

Grant Donnelly, Marketing and Logistics

Bartow Elmore, History

Darryl Hood, Environmental Health Sciences

John Horack, Mechanical and Aerospace Engineering, *Joint Appointment with:* Public Affairs

Ian Howat, School of Earth Sciences

Allison MacKay, Civil, Environmental and Geodetic Engineering

Lauren Pintor, School of Environment and Natural Resources

Mark Weir, College of Public Health

Staff Members

Elena Irwin, Faculty Director, Distinguished University Professor

Kate Bartter, Executive Director

Kathy Jackson, Program Assistant

Gina Jaquet, Director, Sustainability Education and Learning

Josh Knights, Director of Partnerships

Kim McIlwaine, Executive Assistant

Charlene Brenner, Research Development Specialist

Liz Quigley, Co-Curricular and Community Initiatives Program Manager

Mike Shelton, Associate Director

Katie Zimmerman, EmPOWERment Program Manager