

## 2020 Year in Review

# Join us to help catalyze a bold, new world.

If 2020 taught us anything, it's that the stakes have never been higher for our planet. Across the globe, more people are losing their homes to unpredictable weather, climate disasters—and now—to a deadly pandemic likely linked to humans' destruction of natural habitats. Every future human endeavor rests on sustainability. For the last decade, Cornell Atkinson has built vital cross-disciplinary research connections: bringing the best minds together to solve humanity's biggest shared challenges. But research alone is insufficient to change opinions, practices, products, and policies.

## From the director

In the ten years since David '60 and Patricia Atkinson endowed the Cornell Atkinson Center for Sustainability, the past year stands out as a reminder of the urgency to understand and address the world's sustainability challenges. We have witnessed the consequences of increasing pressures on our planet and its people due to rapidly accelerating climate change, population growth, shrinking biodiversity, and widening economic and social inequalities.

Because of our long-term success, I remain optimistic that large-scale solutions can leverage Cornell University's broad and deep expertise in key areas of research, including climate, energy, food, and health. Which is to say, the work of Cornell Atkinson has never been more critical. I am proud to share the 2020 Year-in-Review with an emphasis on Cornell Atkinson's distinctive approach to incentivizing novel, cross-college collaborations.

Cornell Atkinson is celebrating its accomplishments while focusing with



Photo: Sheryl Sinkov

renewed urgency on the future. We are seeding high-risk collaborative research, training sustainability scholars, hatching insights and interactions through working groups, and catalyzing these efforts to translate knowledge to impact through collaborations with corporations, foundations, government partners, and NGOs.

I am energized by our growing community of faculty, students, staff, alumni, and partners. In the face of tremendous uncertainty and upheaval, their work and our efforts to support them continue to advance our mission to change public opinions, products, practices, and public policies necessary to solve the world's foremost sustainability problems.

This is world-changing and soul-fulfilling work that reflects who we are at Cornell University and helps us realize who we can be. Together, we're building a resilient tomorrow.

Sincerely,



## Powerful Partnerships

Cornell Atkinson connects corporations, policymakers, foundations, and NGOs to interdisciplinary research projects that drive creative solutions, new ideas, and big impact.

## Innovations to Increase Food Security



Innovations in agri-food systems have brought dramatic advances in human well-being. Yet these gains are becoming unsustainable due to mas-

sive, adverse spillover effects on climate, natural environment, public health and nutrition, and social justice. To map the way forward, Cornell Atkinson and the journal Nature Sustainability convened a global panel of more than 20 experts in business, economics, ethics, and plant and energy science. The year-long effort, led by Chris Barrett (Cornell Dyson School of Applied Economics and Management), produced a report, outlining recommendations for making future food systems healthy, equitable, resilient, and sustainable. A key component? Combining social and technological innovations for a better local fit and higher likelihood of adoption.

## Soil Health Calculator Supports Climate-Smart Farming

In June 2020, Cornell Atkinson's strategic partnerships team hit a key milestone with partner Walmart: Fellows Peter Woodbury, Dominic Woolf, and Christina Tonitto (College of Agriculture and Life Sciences) delivered their online Fertilizer and Soil Tool for estimating greenhouse gas emissions (FAST-GHG). In the fall, Walmart adopted FAST-GHG for its Project Gigaton, an initiative that aims to remove one billion metric tons (a gigaton) of greenhouse gases from its global supply chain by 2030. The tool allows U.S. producers of corn, soybean, and wheat to calculate their avoided GHG emissions associated with cover crops, reduced tillage, and nitrogen fertilizer.

Cornell Atkinson's strategic partnerships team coordinated and funded the project, while Cornell faculty worked alongside scientists

from the Environmental Defense Fund and The Nature Conservancy to create and refine the tool.

**“Looking beyond this partnership, other organizations could build on this process for more agricultural products in different parts of the world.”**

-Peter Woodbury, (CALS)

## Transition to Boost Regenerative Agriculture

Regenerative agriculture systems that minimize soil disturbance, maximize crop diversity, maintain root structure, and integrate livestock have been shown to reduce sediment and nutrient runoff from farms. But adoption has been hindered by actual and perceived costs and risks. The Great Lakes Protection Fund has awarded Cornell Atkinson \$1.2 million to develop innovative transition loan products that provide a safe, attractive option for farmers wanting to embrace regenerative agriculture.

**“There's no silver bullet in food innovation. During the Green Revolution, breeders improved seeds, but scaling those advances involved improving roads and offering services to educate farmers on using seeds properly. These many pieces were essential, complementary elements.”**

-Chris Barrett, lead author (Dyson)

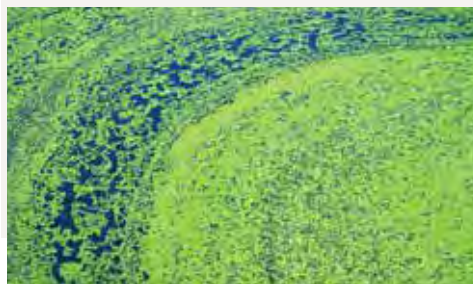
The Cornell team, led by Alan Martinez (Cornell Atkinson) and Fellow John Tobin-de la Puente (Dyson), will tap into the expertise of Cornell Atkinson's conservation finance working group as well as faculty and student researchers from across the university. They will engage a broader set of stakeholders and behavioral change experts as they aim to co-create and test a range of investment strategies that support regenerative agriculture starting with farmers in the Lake Ontario watershed in New York State.

## Bright Minds, Bold Timelines

Since initiated in 2018, the Academic Venture Fund (AVF) has supported 135 projects, with more than 280 Cornell researchers from every college and school on campus. The AVF supports novel, risky, and innovative projects that go on to attract external funding. The projects below are poised to contribute to large-scale sustainability solutions.

## Tracking the Impact of Toxic Algal Blooms

In 2019, Kathryn Fiorella (College Veterinary Medicine), Chris Barrett (Dyson), and Peter McIntyre (CALS) received an AVF award to examine the health dangers and socioeconomic challenges created by toxic algal blooms. In 2020, the National Science Foundation awarded the research team a five-year, \$1.5 million grant to continue the study.



## Microbes for More Sustainable Rare-Earth Mining

A 2019 AVF project, led by Buz Barstow (CALS), explored using microbes to mine rare-earth minerals and lower the carbon footprint of smart energy systems. In 2020, a U.S. Department of Energy agency awarded a \$1 million grant to Barstow and fellow researchers Mingming Wu (CALS), Esteban Gazel and Megan Holycross (College of Engineering) to genetically program microbes to mine the minerals used in consumer electronics and in advancing renewable energy.

**“The AVF award was so important. It allowed us to apply a new approach to genetics, with the outcome of separating and extracting rare earth metals.”**

-Buz Barstow, Principal Investigator, (CALS)

## Affordable Digital Infrastructure

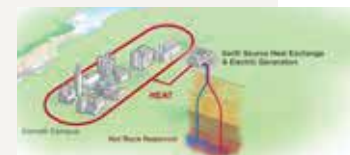
Many rural areas lack adequate cellular service and wireless telecommunication infrastructure. In 2018, Max Zhang (ENG) and his team received AVF funding to test an affordable, public “Internet of Things” (IoT) in Tompkins County, NY to bridge the digital divide between rural and urban areas. IoT infrastructure refers to digital connections between everyday things, like home thermostats controlled by smartphones via wireless internet.



In 2020, the research team received a \$1.5 million grant from the National Science Foundation to help design the nation's first statewide public IoT infrastructure. The project team—co-led by Lee Humphreys (CALS) and Steve Wicker (ENG), and including David Shmoys (ENG), Rick Geddes (College of Human Ecology), and David Kay (CALS)—will work with Cornell Cooperative Extension specialists to collaborate with community partners across New York.

## Cornell's Earth Source Heat Transformation

In 2015, Cornell Atkinson began supporting Fellow Jeff Tester's research to determine whether Earth Source Heat (ESH) was a sustainable way to heat Cornell's Ithaca and NY campuses, and meet the university's goal of carbon neutrality by 2035. Thanks to funding from three AVF awards, this project progressed through several





phases and has engaged engineers, social scientists, and experts from across Cornell.

In 2020, these efforts took a leap forward when Cornell secured a nearly \$7.2 million grant from a U.S. Department of Energy agency to fund exploratory research—in the form of a two-mile-deep borehole—to help verify the feasibility of the novel ESH system, which will bring the heat of the earth to the Cornell campus.

## Training the Next Generation of Sustainability Scholars

Cornell Atkinson is training the next generation of sustainability scholars, preparing Cornell students and postdoctoral associates to become pioneers in solving our planet's sustainability challenges.

**Cornell Atkinson – Environmental Defense Fund Internship** provides ten undergraduate and graduate students with real-world experience in sustainability

“It was motivating to see the passion the people at the Environmental Defense Fund share. I grew so much in such a rich and accepting environment.”

– Rashika Mittal, 2020 Sustainability Intern



Photo: Rashika Mittal

## Flexible Funding, Real-World Impact

Cornell Atkinson's Rapid Response Fund (RRF) supports urgent sustainability initiatives and Cornell's collaborative research community.

## COVID-19 Rapid Response Fund

When the COVID-19 pandemic hit, Cornell Atkinson offered flexible targeted funding to support Cornell faculty to conduct surveys, design tools and products, and gather data quickly during the evolving global crisis. The special call for proposals was issued in collaboration with Cornell's Master of Public Health Program, the Office of the Vice Provost for International Affairs, and Cornell Research Service's SARS-CoV-2/COVID-19 Rapid Response Research initiative.

Thanks to these COVID-19 RRF awards, Cornell faculty, postdoctoral researchers, and students from 11 colleges are working on COVID-related research projects. The Center awarded 30 RRF grants in 2020. Many have already gathered insights and designed applications to inform new research approaches, such as mitigating the proliferation of misinformation on social media and using real-time, high-resolution data to measure the economic and environmental impact of the pandemic.

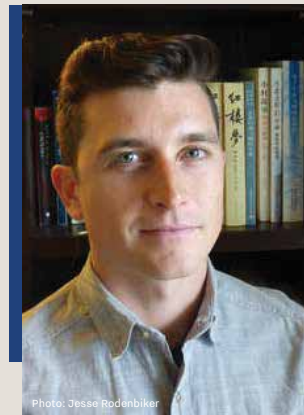


Photo: Jesse Rodenbiker

**Cornell Atkinson Postdoctoral Fellowship** supports four outstanding scholars working across the globe

“The Cornell Atkinson Postdoctoral Fellowship in Sustainability facilitates interdisciplinary connections with Cornell faculty and partnerships with local NGOs. These cross-cutting collaborations are essential to the conceptual and practical work of sustainability.”

– Jesse Rodenbiker, 2020 Postdoctoral Fellow

## Cornell Atkinson organized Cornell's first-ever Sustainability Hackathon

The hackathon virtually hosted 84 students from 12 universities around the world in October. Student-led teams worked together to devise solutions for market-ready, energy-smart systems. Students gained mentoring support from industry experts, who empowered participants to create real-world solutions

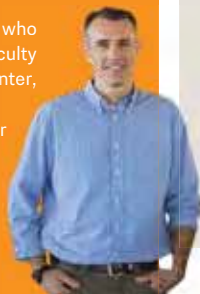
for sustainably producing, storing, and distributing energy. A team of Cornell students took home the Grand Prize for their project focused on optimizing electric vehicle charging behavior.

Programs like the Sustainability Hackathon provide Cornell students with learning opportunities for impactful careers in sustainability.



## Endowed position from Cornell alumnus secures continuous thought leadership

We are grateful to David Drinkwater '94, who has made a generous gift to endow a Faculty Director position at Cornell Atkinson Center, to be known as the David Drinkwater Faculty Director. Daryl Nydam, professor in Population Medicine and Diagnostic Sciences in the College of Veterinary Medicine, currently holds the position.



# Finances

For fiscal year 2020 (FY20), ending June 30, 2020, Cornell Atkinson expenses totaled \$6.4 million, including \$3.7 million to support sustainability research and programs across campus. FY20 revenues totaled \$7.8 million, with endowment income (52 percent) and program-specific current use gifts (35 percent) as the main sources of revenue.

We appreciate funding from generous individual donors to support our: working groups (\$1.5 million), EDF partner programs (\$475,000), TNC partner programs (\$350,000), and Cornell Atkinson Postdoctoral Fellowship program (\$365,000). We also appreciate receiving annual financial support from Cornell college deans and the Office of the Provost.

Overall, Cornell Atkinson's FY20 revenue was seven percent above budget. These financial results place us in a strong position to advance the goals of our 2018-2023 strategic plan.

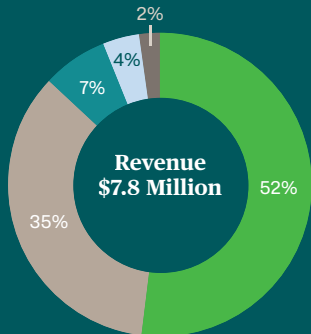


## Vital Connections

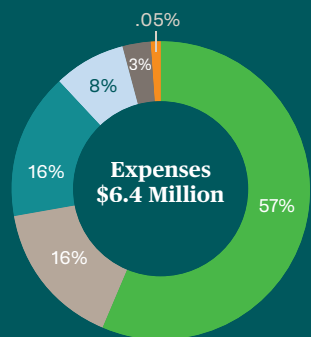
At Cornell Atkinson, we forge new and unexpected connections to ensure that people and the planet not only survive, but thrive. With Cornell University's deep and broad knowledge base as our foundation, we bring together experts, inventors, practitioners, business leaders, and philanthropists to deliver large-scale, long-term sustainability solutions.

Global urbanization presents one of our greatest future challenges. By 2050, an estimated 70 percent of the world's population will live in cities, relying on essential resources provided by those living in rural areas. To be resilient, cities must reduce resource consumption and utilize policies, practices, and products that allow rural communities to reap equitable benefits.

Inspired by the United Nations' 2030 Sustainability Goals and a holistic perspective, Cornell Atkinson is focused on research to develop resilience and equity in four key areas connecting the lives of rural and urban dwellers.



- Endowment Income
- Other Current Use Gifts
- Program-specific Gifts
- Grants & Other
- Cornell Support



- Research & Programs
- Communications
- Administration
- Development
- Program Support
- Strategic Faculty Hiring

## Building Resilient Rural-Urban Systems

Cornell Atkinson Research Priorities 2018-2023

### Increasing Food Security

Improving the systems of agriculture, aquaculture, and wild food harvest to meet the nutritional needs of all those living today while enhancing the quality of life of those producing the food—and the land, aquatic biodiversity, and ecosystems on which they depend.

### Reducing Climate Risks

Innovating technology, financial instruments, and policy to reduce greenhouse gas concentrations and adapt infrastructure, agriculture, and health systems to equitably protect human health, safety, and prosperity from the impact of increasingly catastrophic droughts, floods, storms, and wildfires.

### Accelerating Energy Transitions

Connecting research with for-profit corporations, non-profit organizations, and government to enhance the generation, distribution, and storage of clean energy for heating and cooling, electricity, and transportation.

### Advancing One Health

Incorporating our understanding of the inextricable dependence of human health and happiness on the health of nature into the development of agriculture and infrastructure systems.

**EQUITY:** Social stability is essential for sustainability practices and policies to take root.

**BUILT ENVIRONMENT:** The man-made structures, features, and facilities in which people live and work are affected by and affect the four areas.



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