SCHOOL OF GLOBAL ENVIRONMENTAL SUSTAINABILITY

COLORADO STATE UNIVERSITY

2022-2023 Annual Report

SCHOOL OF GLOBAL ENVIRONMENTAL SUSTAINABILITY

Dear Friends of SoGES,

2022-2023 was an exciting and productive year for the School of Global Environmental Sustainability. We continued development of new sustainability curriculum, provided support for research conducted by individual faculty members and interdisciplinary teams across CSU, and organized a large climate change summit on campus and a large international event focused on soil biodiversity and ecosystem function.

Our partnership with the CSU President's Sustainability Council (PSC) provided funding for creation of four new sustainability-focused courses in the Warner College of Natural Resources, College of Business, College of Agriculture, and College of Health and Human Sciences. It also supported substantial revisions to increase sustainability content of three pre-existing courses in the College of Liberal Arts and College of Natural Sciences. The Africa Center, hosted by SoGES, initiated a new set of scholarships that support graduate student research on African sustainability issues.

SoGES includes two efforts focused on understanding and protecting Earth's biodiversity. The Global Soil Biodiversity Initiative (GSBI) held its 3rd global conference on March 13-15, 2023, in Dublin, Ireland, attracting about 650 of the world's leading soil biodiversity experts from 120 different nations. The conference addressed topics ranging from the role of soil biodiversity in food security and climate change mitigation to development of new policies to protect soil heath. Participants included scientists, students, land managers, policy-makers, regulators, environmental agencies, and conservationists. The Global Biodiversity Center (GBC) continued to champion the incorporation of genetic information and considerations into decisions on listing and de-listing of endangered species in the U.S. The GBC also contributed to development of a new Global Biodiversity Framework under the United Nations Convention of Biological Diversity.

Colorado State University's Johnson Hall, where the School is located.

Climate change was another major focus this year. SoGES and the Poudre School District in Fort Collins collaborated on a second climate leadership conference that brought more than 400 high school students to the CSU campus. The event featured lectures and interactive discussions on topics that included wind energy development, climate policy, and the interactions of climate change and agriculture. We also continued to participate in the CSU Climate Adaptation Partnership and are working with colleagues from many different departments on campus to initiate a new "climate hub" at the CSU SPUR facility in Denver that will offer an array of climate services to local and regional stakeholders.

Thank you for your interest in SoGES activities.

Diana Wall, SoGES Director
Peter Backlund, SoGES Associate Director

2022-23 AT A GLANCE

RESEARCH

pages 4-7

SoGES provides funding for CSU research teams and faculty fellows and conducts research supported by outside sponsors.

$70,000 was awarded by SoGES to CSU sustainability researchers
2 teams funded with **7** investigators from **6** departments across **3** colleges
3 resident faculty fellows funded from **3** departments across **2** colleges

EDUCATION & TRAINING

pages 8-15

SoGES offers the Global Environmental Sustainability minor and three additional focused sustainability minors, conducts a graduate student training program, and oversees a set of graduate certificates.

461 students completed GES courses
171 students were enrolled in **4** undergraduate minors
71 students graduated with SoGES minors (**58** from GES, **6** from Energy, **5** from Water, and **2** from Peace and Reconciliation)
20 Sustainability Leadership Fellows from **15** departments across **6** colleges
$60,250 was awarded by SoGES and the Presidents Sustainability Commission to CSU faculty to support sustainability curriculum development
7 Sustainability Curriculum Innovation Grants awarded with **13** faculty from **7** departments across **5** colleges

CENTERS & PROGRAMS

pages 16-19

SoGES houses and supports international programs and the Student Sustainability Center.

The **Student Sustainability Center** increased engagement efforts and hosted multiple successful outreach events
The **Africa Center** initiated a new graduate student scholarship opportunity to support research in Africa totaling **$20,000**
Global Biodiversity Center director, Chris Funk, worked with international and national scientists and policy makers to develop the new Global Biodiversity Framework as part of the Convention on Biological Diversity
The **Global Soil Biodiversity Initiative** hosted the third Global Soil Biodiversity Conference in Dublin and attracted about 650 of the world's leading soil biodiversity experts from more than 120 different countries

ENGAGEMENT

pages 20-21

SoGES works with the media and diverse stakeholders to identify, discuss, and increase awareness of sustainability issues and ensure that sustainability research is informed by societal needs and concerns.

Over **1,700** people attended **16** events organized and hosted by SoGES and collaborators
400 students attended the Climate Leadership Summit, co-organized by SoGES and Poudre School District

RESEARCH

The School of Global Environmental Sustainability is committed to finding innovative solutions to new and existing sustainability problems through rigorous scholarship and interdisciplinary expertise. SoGES is a catalyst for creative problem solving and invests in people who are willing to work towards sustainability grand challenges. These challenges are larger than any one academic pursuit or discipline, so solving them demands interdisciplinary collaboration.

Our School supports interdisciplinary projects conducted by teams of CSU researchers (Global Challenges Research Teams) and individual faculty members (Resident Fellows).

In 2022-23, SoGES awarded $70,000 to CSU researchers and supported 2 research teams and 3 faculty fellows.

10 investigators | **9** departments | across **4** colleges

Global Challenges Research Teams

Leveraging social networks and mobile technologies to promote human-carnivore coexistence

Principal Investigators: **Jonathan Salerno** (Department of Human Dimensions of Natural Resources), **Kevin Jablonski** (Department of Animal Sciences), **Stewart Breck** (Center for Human-Carnivore Coexistence)

Carnivore populations globally are experiencing dramatic declines due to accelerating habitat loss and direct conflict with humans. Carnivore decline has widespread consequences for ecosystem function, and human-carnivore coexistence requires balancing conflicts that can impact the social and economic well-being of human communities.

This team is researching how people's beliefs and experiences impact their behaviors regarding carnivore tolerance and intolerance, and how these behaviors spread through communities via social networks. They are using survey and mobile phone data to assess pastoralist conflict with lions in Tanzania. The team will use these findings to better understand how culture and social networks affect human-carnivore tolerance and coexistence and to inform how to effectively create conservation interventions that align with cultural norms. In their first year the team focused on research design, began field data collection, model developing, and practitioner outreach in Tanzania and the U.S.

Image: herd groups in outer rim
Courtsey of Jon Salerno

Upcoming plans

- Network data collection and model construction to simulate tolerance dynamics under ongoing and proposed conservation intervention scenarios
- The team plans to host a CSU-based workshop on sustainable approaches to reducing carnivore conflicts
- As research products are pushed out the team plans to share outcomes and advance the research coalition to present mapping and intervention scenario work

Publication

Warrier R, Boone R, **Salerno J.** (2023). Migration-land systems model: a theoretical agent-based model. Mountain Scholar. https://doi.org/10.25675/10217/236080.

Wildfire Smoke Impacts on U.S. Solar Energy Resources and Agrivoltaic Systems

Principal Investigators: **Jesse Burkhardt** (Department of Agricultural and Resource Economics), **Jeffrey Pierce** (Department of Atmospheric Science), **Nathan Mueller** (Departments of Ecosystem Science and Sustainability & Soil and Crop Sciences), **Emily Fischer** (Department of Atmospheric Science).

Climate change necessitates a rapid transition from fossil fuels to renewable energy resources, particularly in the U.S. One path toward a sustainable future lies in solar energy production. The Department of Energy aims to transition the U.S. to receive 45% of its energy from solar power by 2050. The U.S. has also experienced an increase in wildfire frequency and burn due to climate change. The increase in wildfire activity means an increase in wildfire smoke emissions that often travel far from active fire sources. Projections indicate that climate-driven wildfire emissions will increase dramatically and that over half the total fine PM in the contiguous U.S. will be from wildfire emissions by 2100. This project will be the first to isolate the economic and social impacts of surface-level wildfire smoke on solar resource potential. In the first year the team was able to publish an article on the impact of wildfire smoke on agricultural potential. As a follow-up to this article, the researchers worked on how smoke will affect solar photovoltaic potential as the grid transitions to a greater share of renewable energy.

Upcoming plans

- Continue research and submit to journal for publication. This requires in-depth research about electricity grids, download electricity generation data, and create small simulations of the electricity grid.
- Work on smoke and agricultural workers with the assistance of expertise from atmospheric science team members to inform modeling choices and understand how air pollutants, including smoke, travel through the atmopshere.

Publication

Corwin, K. A., Corr, C. A., **Burkhardt, J., & Fischer, E. V.** (2022). Smoke- Driven Changes in Photosynthetically Active Radiation During the U.S. Agricultural Growing Season. In Journal of Geophysical Research: Atmospheres (Vol. 127, Issue 23). American Geophysical Union (AGU). https://doi.org/10.1029/2022jd037446

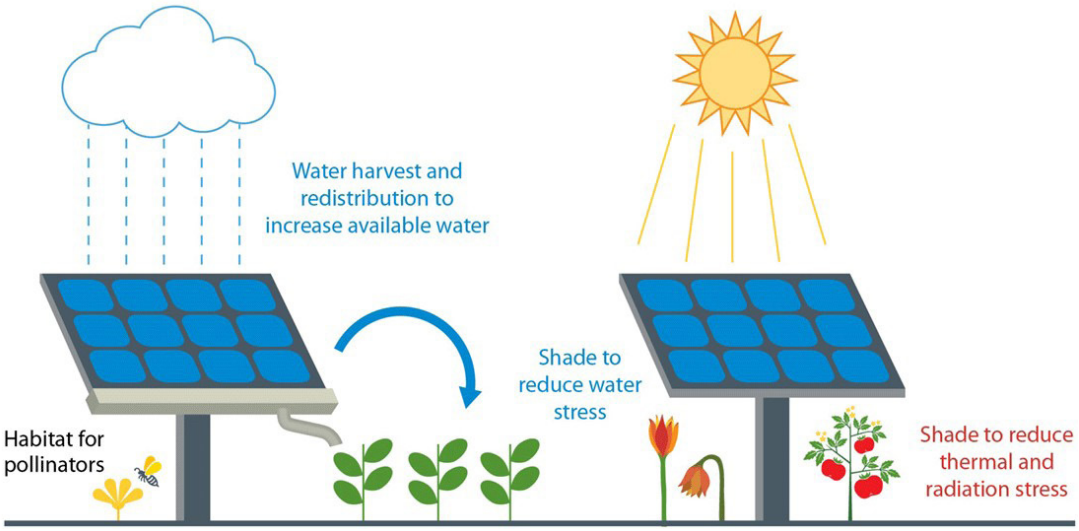

Image: basics of agrivoltaics

Fostering innovative interdisciplinary sustainability scholarship that applies to real world problems is central to the SoGES mission. To achieve this, SoGES competitively awards funding for our Global Challenges Research Teams (GCRTs), which are collaborative teams of faculty that build cross-campus partnerships to address the world's most pressing regional and global sustainability issues.

Starting in 2020, SoGES enlarged the scope of the GCRT program from annual projects with a one-year budget to funding two-year projects that are awarded bi-annually. This change allows GCRTs to address more complex problems and provides additional time for interdisciplinary team development. The projects listed here began in the 2022-2023 academic year. **Since its inception, SoGES has funded 49 GCRTs with principal investigators from 52 departments across each of CSU's eight colleges.**

RESEARCH

Resident Fellows

SoGES Resident Fellows are CSU faculty members who engage in creative sustainability research and problem solving. SoGES provides seed funding to enhance scholarly contributions to sustainability, accelerate progress, and participate in the academic life of the School. Since its inception, **SoGES has funded 47 Resident Faculty Fellowships from 23 departments across all eight CSU colleges.**

Terrence Iverson Department of Economics

Terrence Iverson's Resident Fellow goal was to conduct research in the direction of developing a new idea for a climate change agreement that could be implemented by a modest sized group of economically powerful participants, such as the United States and European Union. Big countries have greater bargaining power in trade negotiations than smaller countries, Iverson's goal was to design a climate club that takes this difference as a starting point. He presented the idea four times throughout his Fellowship from Colorado to Zurich. After completing the research in April he submitted a paper to the American Economic Reivew, a top-five journal in economics.

After completing the paper Iverson applied and received a grant to extend his sabbatical during the 2023-24 academic year from 6 months to 12 months. This extension will allow him to build on the research ideas from his Fellowship and turn it into an academic book, with a working title of, "Getting Serious: Economic Insights to Combat Global Warming". The goal of the book is to present his ideas about what it will take to address climate change policy in a serious way. Building on the recent economics literature and his own research, he will link negotiation of a climate agreement with the use of trade instruments like the threat of sanctions to induce other countries to do a modest amount of matching climate policy.

Publication

Iverson, T. (2023). Tiered Climate Clubs: A Bottom-Up Approach to Abate Global Emissions. In SSRN Electronic Journal. Elsevier BV. https://doi.org/10.2139/ssrn.4433641

Mostafa Yourdkhani Department of Mechanical Engineering

Decarbonization of the U.S. transportation and energy industries requires developing lighter materials and structures while maintaining or improving the cost and efficiencies of current systems. The goal of this Fellowship was to develop a simple process for rapid, energy-efficient manufacture of recyclable, high-performance composite materials to enable sustainable and affordable production of lightweight composite structures. Through the study of literature and assistance of a graduate student, Yourdkhani was able to explore one of the solutions and make promising progress, however could not finalize the chemical formulation. His results showed the need for a longer and funded research program in order to develop the material and resulted in a research proposal submitted to the Colorado Office of Economic Development and International Trade (OEDIT) that received funding. While the original goal to develop fully recyclable composites was unachievable in this timeframe, Yourdkhani was able to develop a sustainable additive manufacturing technology for wind energy applications. Development of recyclable composites is a core mission for Yourdkhani and he plans to seek federal grants using the preliminary data he gathered during his Fellowship.

Photo: Net-zero 3D printing of carbon fiber composites in midair
Courtesy of Mostafa Yourdkhani

Dimitris Stevis Department of Political Science

The strategy of just transition, a transition that is humane and equitable to people affected while propelling us all towards sustainability, is receiving growing global and local attention. The goal of this Fellowship was to expand the universe of just transitions beyond energy (without dismissing the centrality of energy). To begin his research, Stevis pursued this in two courses taught during the Fall 2022- a thematic seminar (POLS692) and Globalization, Sustainability and Justice (POLS462). The seminars offered a systematic history and explored current practices and debates on just transitions. This allowed Stevis to expand his own understanding through the lens of a diverse set of students. Each student explored a particular type of just transition (e.g. water, land, food, indigenous people, etc). Once the students familiarized themselves with the issue they had to explore whether the concept of just transition offered any insights that would not be available otherwise. The two courses concluded with research papers and Story Maps that demonstrated the concept of just transition in different ways.
In spring 2023 Stevis worked with regional scholars and advocates to present a webinar that explored four areas:

1. Whether the strategy of just transition can be applied across all transitions
2. Whether the strategy of just transition can initiate, as well as respond to transitions
3. The intersection of the just transition strategy and eco-social movements
4. The implications of the strategy's mainstreaming

This webinar garnered an attendance of over 40 attendees and is anticipated to be the first of a series.

Photo: Just Transitions:Expanding the Scope webinar poster

Research Proposal Coordination

In 2022-23 SoGES added a Research Proposal Coordinator to the staff, adding a new dimension to the Schools support for interdisciplinary research. As part of his role, Darren Cockrell finds and matches funding opportunities to CSU researchers, connecting interdisciplinary teams, supporting proposal development, budgeting, etc. Highlights from the first year of proposal coordination include:

- Helped with multiple proposal submissions to the National Science Foundation and Department of Energy
- Assisted SoGES affiliate faculty in various stages of proposal development and submissions to government and private sector funders, including Google, Environmental Defense Fund, USDA-NIFA, and USDA NRCS.
- Played a vital role in SoGES internal proposal subissions

EDUCATION & TRAINING

SoGES education efforts are interdisciplinary, with learning options that include individual courses, undergraduate minors, and leadership training and certificates for graduate students and postdocs. The School educates and equips students with knowledge and tools to tackle sustainability challenges.

INTERDISCIPLINARY CURRICULUM

Curricula for the School's minors focus on a comprehensive understanding of the linkages between society, economics, and the environment, upon which sustainable human actions can be based. Students who complete the curriculum will be able to determine solutions to problems that have developed from human interactions with the environment.

Curriculum development and strategy is overseen by the SoGES Curriculum Committee. It includes representatives from all eight CSU colleges and the CSU library and sets educational priorities for the School.

Curriculum Committee

Kathleen Galvin (Chair)	Anthropology; The Africa Center; and SoGES
Ryadi Adityavarman	Design and Merchandising
Delphine Farmer	Chemistry
Yoichiro Kanno	Fish, Wildlife, and Conservation Biology
Dale Lockwood	Biology and SoGES
Susan Melzer	Soil and Crop Sciences and SoGES
Pinar Omur-Ozbek	Civil and Environmental Engineering
Howard Ramsdell	Environmental and Radiological Health Sciences
Joshua Sbicca	Sociology
Grace Wright	College of Business

Global Environmental Sustainability Minor

The Global Environmental Sustainability (GES) minor addresses the interrelated issues of environmental, societal, and economic sustainability, including climate change, pollution, biodiversity loss, public health, environmental justice, food security, and global-scale development. Students gain deeper understanding of sustainability problems and tools to bring sustainability into their career paths. The GES minor is also available as an online option for students. **In 2022-2023 there were 118 students enrolled and 58 graduates from the GES Minor.**

Sustainability in Peace and Reconciliation Studies Minor

Peace and reconciliation are an important component of – and contributor to – societal and economic sustainability. This minor provides students with extensive background in the social, philosophical, and educational aspects of peace and reconciliation and explores their intersection with environmental sustainability. **In 2022-2023 there were 10 students enrolled and 2 graduates from the Sustainability in Peace and Reconciliation Studies Minor.**

Sustainable Energy Minor

Improving the sustainability and reducing the negative environmental impacts of energy systems requires a broad understanding of technical, environmental, and social science issues. This minor equips students with the skills and knowledge necessary to understand the challenges and opportunities in transitioning to a sustainable energy future. *Collaborative with the CSU Energy Institute*. **In 2022-2023 there were 20 students enrolled and 6 graduates from the Sustainable Energy Minor.**

Sustainable Water Interdisciplinary Minor

Issues surrounding water supply, water quality, and ecological water relationships are increasingly important as population growth continues, water uses multiply, and competition for water increases. This minor provides students with the opportunity to gain detailed knowledge about the complex challenge of sustainable water management. *Collaborative with the CSU Water Center*. **In 2022-2023 there were 23 students enrolled and 5 graduates from the Sustainable Water Interdisciplinary Minor.**

Course Offerings 2022-2023

GES 101*
Foundations of Global Environmental Sustainability

GES 120
Water in the Western US

GES 130
Introduction to Sustainability Engagement

GES 141
Introduction to Sustainable Energy

GES 330
Sustainability in Practice

GES 440
Sea Level Rise and a Sustainable Future

GES 441
Analysis of Sustainable Energy Solutions

GES 465
Sustainable Solutions to Electronic Waste Management

GES 470*
Applications of Global Environmental Sustainability

GES 520*
Issues in Global Environmental Sustainability

GES 528
Assessing the Food, Energy, Water Nexus

*** Face-to-face and online options**

In 2022-2023...

461
students completed GES courses

171
students enrolled in the 4 SoGES minors

Since SoGES began education efforts in 2010...

5,923
students have completed GES courses

909
students have graduated with a GES Minor

Graduate Certificates

The graduate certificates in Applied Global Stability are designed to meet the global stability needs of senior non-commissioned officers and mid-career officers in the Special Operations Forces community, Department of Defense, USAID, Peace Corps, and other development professionals. **In 2022-2023 there were 4 students enrolled.**

Core Faculty

Dale Lockwood is the Academic Coordinator for SoGES and holds a joint appointment as Assistant Professor in SoGES and the Department of Biology. A population ecologist, his work involves the analysis of complex population dynamics of rangeland grasshoppers, modeling larval dispersal in marine organisms to better implement marine reserves, and work on the ecological genetics of plant species related to storage in seed banks. His research has been honored with one paper being named the Outstanding Paper in Genetic Resources by the Crop Society of America and another named one of the most important papers in the *Journal of Range Management* in the last 50 years. Lockwood teaches GES courses for SoGES and in the Biology Department and has been nominated for Honors Professor Award, CSU Teacher of the Year, and Greek Life Outstanding Faculty.

Susan Melzer holds a joint appointment as Assistant Professor in SoGES and the Department of Soil and Crop Sciences. Her research focuses on quantifying weathering rates and examining the impact of climate change and land-use on soil genesis, soil quality, and system resilience. She works in close collaboration with the USDA Natural Resources Conservation Service, U.S. Forest Service, and National Park Service to develop accessible educational resources and experiential learning opportunities that are data driven and will enable an integrated, applied, and transdisciplinary link between educators, researchers, managers, and students. In 2020, Melzer was named a Provost Teaching Scholar as part of the Celebrate! Colorado State Awards.

EDUCATION & TRAINING

SUSTAINABILITY CURRICULUM INNOVATION GRANTS

The School of Global Environmental Sustainability, in partnership with the President's Sustainability Commission, competitively awards annual Curriculum Innovation Grants to faculty to expand student exposure to interdisciplinary sustainability concepts across all fields of study at CSU.

Sustainability's global grand challenges affect everyone. It is Colorado State University's goal that all graduating students have the knowledge and tools to tackle these complex and interconnected problems in their future careers. Sustainability Curriculum Innovation Grants for faculty take initial steps toward expanding student exposure to interdisciplinary sustainability concepts across all fields of study at CSU. With these grants, CSU faculty can develop creative approaches that integrate interdisciplinary sustainability content into existing and new coursework. They elevate both the quality and quantity of student exposure to complex sustainability concepts.

IN 2022-2023 SOGES CURRICULUM INNOVATION GRANTS FUNDED -

7 projects | **13** faculty | **7** departments | across **5** colleges

ESG INVESTMENTS

PROJECT LEADS:

Harry Turtle
Professor, Dept. of Finance and Real Estate

Hilla Skiba
Assoc. Professor, Dept. of Finance and Real Estate

The goal of this grant was to develop a new graduate-level experiential business course to explore the use of "Environmental, Social, Governance" (ESG) criteria for managing investments. This new effort will complement a more traditional lecture course on ESG investing, serving as a practicum, or signature experience, and contribute to a new Graduate Sustainability Certificate. The new course is centered on an ESG-focused Student Managed Investment Fund (SMIF) that, as the name implies, would be run by students under the supervision of the course instructors and an advisory group. Development of this course requires many steps beyond the standard creation of an outline and syllabus, including preparation of an Investment Policy Statement (IPS) that follows industry guidelines, raising and/or identifying funds to manage, and development of the investment advisory group. Significant progress was made on these tasks during the year. The team has obtained the approval of the Department chair, College administration, and the Foundation for use of funds from the Summit Student Investment Program Fund, a previously untraded portfolio of donor money with a market value of about $500,000. They drafted an IPS that contains risk and return objectives as well as investment constraints that are consistent with the fund agreement. They have also identified potential members of the investment advisory group, including both private investors and College of Business (COB) faculty.

Feeding the world in a changing climate

PROJECT LEAD:

Justin Reeves
Sr. Instructor, Dept. of Agricultural Biology

One of the most critical challenges facing humanity as the climate continues to change is global food security. This project developed a novel AUCC course that will span a multitude of social and environmental justice issues related to climate change and global food security, while fulfilling the Biological and Physical Sciences AUCC category requirement. As an AUCC course, it will be available to students of all majors on campus. Social-environmental-economic concepts will be infused throughout the entire class, beginning with how the public perceives science and scientists all the way through each science topic and up to discussing global social issues such as climate refugees. Discussing social and environmental justice issues concurrently with the science topics at hand will provide a unique opportunity for students to realize how intricately woven these things are.

Infusing Environmental Geochemistry with Real-world Sustainability examples

PROJECT LEAD:

Jeremy Rugenstein
Asst. Professor, Dept. of Geosciences

To understand the root of and potential solution to many environmental problems requires knowledge of acid-base, redox, and precipitation-dissolution reactions- all of which are fundamental components of environmental geochemistry. When we think about the environmental problems that motivate sustainability work, we often think primarily of the physical. However, these physical problems have a chemical component. Within the CSU Geosciences curriculum, GEOL 366 (Sedimentary Petrology and Geochemistry) is no different. The funding for this project enabled Rugenstein to revise the learning in this course towards developing quantitative skills to understand both the roots of many linked environmental-social problems as well as the potential geochemical solutions.

Rugenstein, along with masters student **Isabella Ulate**, were able to achieve three areas in the re-design of the course to tackle real-world sustainability and environmental justice issues:

1. Redesign all of the quizzes, problem sets, and exams with questions that take fundamental geochemistry concepts
2. Redesign half of the lab sessions in order to develop more applied labs
3. Lastly, every lecture now has at least a 3-minute section devoted to learning how geochemical concepts can be applied

Rugenstein hopes that the changes will make Geochemistry more accessible to all students.

EDUCATION & TRAINING

Learning Forest Contributions in Mitigating Climate Change

PROJECT LEAD:

Srijana Baral
Asst. Professor, Dept. of Forest and Rangeland Stewardship

Forest as a natural climate solution is a highly discussed topic today in forestry and the overall natural resource sector. This project created an undergraduate-level forestry course, F322-Economics of Forest Environment, to educate future generations about the basics of forest carbon and different types of carbon offset markets. Within this course students were introduced to excel problem-solving sessions and incorporated new topics on forest carbon. Excel sessions included in-class use of real-world forestry data and calculations. For the students final project they were trained to use I-Tree Eco software to quantify carbon sequestered and stored by trees. The class was divided into eight groups and assigned different tree covered areas across campus.

The F322 course made three major contributions to advancing sustainability curriculum on campus:

- Introduced new topics on forest carbon for a better understanding of the contributions of forests in mitigating climate change
- Incorporated hands-on experience using I-Tree software for carbon qualification
- Estimated carbon sequestered and stored by trees on CSU campus

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Statistics and Data Science for Sustainability

PROJECT LEADS:

Daniel Weitzel
Asst. Professor, Dept. of Political Science

Iasmin Goes
Asst. Professor, Dept. of Political Science

From the dawn of civilization until the year 2003, humans produced as much information as they now produce within two days. Learning how to extract, clean, analyze, visualize, and communicate these data and produce actionable insights has become a crucial skill in the job market. This project will redesign two interdisciplinary courses that teach statistics and open-source data science, POLS320 and POLS625, with a distinct focus on the social-environmental-economic aspects of sustainability. These courses will equip undergraduate and graduate students across a wide variety of departments at CSU with the skills needed to answer empirical questions about sustainability and the environment. A first version of this project was implemented using new examples to teach statistical concepts, collected data sets that students can use that relate their research interests, and build a curriculum that connects the substantive (environment and sustainably related) research interests of our students with statistical material. The team realized that the project is larger than initially thought and had a challenging time finding appropriate textbook material. In order to complete the project they will likely have to write their own textbook on social science statistics and data analytics for the environment.

Sustainability as an Organizing Principle for Courses on Spanish for the Professions

PROJECT LEADS:

Alyssia Miller De Rutte
Asst. Professor, Dept. of Languages, Literatures, and Cultures

Andrea Purdy
Assoc. Professor, Dept. of Languages, Literatures, and Cultures

Sustainability is a crucial component to teach students, however, it is most often only taught in English. This project addresses the existing language gaps by incorporating sustainability as an organizing principle in Spanish courses. Within the Department of Languages, Literatures and Cultures there is a major concentration which focuses on Spanish language usage in different professions. The Languages for Specific Purposes major, helps translate for professions such as medical, legal, veterinary medicine, and agriculture. By restructuring a required course for Spanish majors and minors, the course was gamified and focuses on sustainability in different areas. The project team was able to focus on different areas of sustainability such as agriculture, immigration, business, and health. A main objective of this project is to provide Spanish language access to underserved/marginalized populations by offering courses that incorporate concepts of sustainability in Spanish.

This grant allowed them to dedicate time to redesign the course which included a new organizing principle, developing a game and activities, making sustainability the overarching theme, and find readings and other materials that would support this work in Spanish.

Sustainable Food Systems: Cultivating a Critical Classroom

PROJECT LEADS:

Jeffrey Biegert
Instructor, Dept. of Food Science and Human Nutrition

Jeffrey Callaway
Assoc. Director, Dept. of Food Science and Human Nutrition

Charlie Hoxmeier
Instructor, Dept. of Food Science and Human Nutrition

Charlene VanBuiten
Asst. Professor, Dept. of Food Science and Human Nutrition

Sustainable food and beverage production is a key component towards food security and energy independence. Inefficient production methods and high waste products associated with food production need to be identified and addressed to create scalable solutions with broad impact.

This grant allowed the team to develop a new course that analyzes the sustainabilty of modern food and beverage production in collaboration with industry and private sectors. The framework for the course included a week-by-week schedule, lecture topics and content, case studies, and projects developed. The course is ready to be added into the College of Health and Human Science undergraduate curriculum. The content in the course aims to fill a gap that has been identified for years by Food Science undergraduate students. Due to the broad nature of this topic, the course will also be approachable across disciplines.

EDUCATION & TRAINING

Sustainability Leadership Fellows

College of Agricultural Sciences

Jackie Billotte
Ph.D. Student, Dept. of Agricultural Biology, **Advisor:** Ruth Hufbauer

Eliza Clark
Ph.D. Candidate, Dept. of Agricultural Biology and Graduate Degree Program in Ecology, **Advisor:** Ruth Hufbauer

Valerie Seitz
Ph.D. Candidate, Dept. of Horticulture and Landscape Architecture and Cell & Molecular Biology, **Advisor:** Jessica Prenni

Sahar Toulabi
Postdoctoral Fellow, Dept. of Horticulture and Landscape Architecture **Mentor:** David Holm

Walter Scott, Jr. College of Engineering

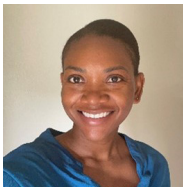
Marybeth Arcodia
Postdoctoral Fellow, Dept. of Atmospheric Science, **Mentor:** Elizabeth Barnes

Julieta Juncosa Calahorrano
Ph.D. Candidate, Dept. of Atmospheric Science, **Advisor:** Emily V. Fischer

Kathryn Moore
Ph.D. Student, Dept. of Atmospheric Science, **Advisors:** Sonia Kreidenweis and Paul Demott

College of Liberal Arts

Débora Nunes
Ph.D. Student, Dept. of Economics, **Advisor:** Elissa Braunstein



Michelan Wilson
Ph.D. Candidate, Dept. of Economics, **Advisor:** Edward Barbier

Mary Witlacil
Ph.D. Candidate, Dept. of Political Science, **Advisor:** Bradley Macdonald

College of Natural Sciences

Matt DeSaix
Ph.D. Candidate, Dept. of Biology, **Advisor:** Kristen Ruegg

Olivia Hajek
Ph.D. Student, Dept. of Biology and the Graduate Degree Program in Ecology, **Advisor:** Alan Knapp

Mary Linabury
Ph.D. Candidate, Dept. of Biology and the Graduate Degree Program in Ecology, **Advisor:** Melinda D Smith

Sheela Turbek
Postdoctoral Fellow, Dept. of Biology, **Mentor:** Kristen Ruegg

Warner College of Natural Resources

Julia Branstrator
Ph.D. Student, Dept. of Human Dimensions of Natural Resources, **Advisor:** Christina Cavaliere

Saeideh Esmaeili
Postdoctoral Fellow, Dept. of Ecosystem Science and Sustainability, **Mentor:** Sarah R.B. King

Bennett Hardy
Ph.D. Candidate, Dept. of Fish, Wildlife, and Conservation Biology and the Graduate Degree Program in Ecology, **Advisors:** Larissa Bailey and W. Chris Funk

Emily Iskin
Ph.D. Candidate, Dept. of Geosciences, **Advisor:** Ellen Wohl

Clara Mosso
Ph.D. Student, Dept. of Ecosystem Science and Sustainability and the Graduate Degree Program in Ecology, **Advisor:** Stephanie Kampf

College of Veterinary Medicine and Biomedical Sciences

Coby McDonald
Postdoctoral Fellow, Dept. of Microbiology, Immunology, & Pathology and Biology, **Mentors:** Sue VandeWoude and W. Chris Funk

2022-23 saw the 12th cohort with 20 Fellows from 15 departments across 6 colleges.

The year-long **Sustainability Leadership Fellows (SLF) program** trains early career scientists to effectively communicate scientific findings to the media and public. The program hones professional development skills and techniques, and encourages fellows to strategically build meaningful careers that incorporate engagement and interdisciplinarity. The SLF helps the scientists that will be solving tomorrow's grand challenges of sustainability have greater impact, reach broader audiences, and think more expansively about their work and its role in the world.

Fellows took part in a 2-day intensive science communication training workshop, as well as focused workshops led by experts on a range of topics including time management, interacting with policy makers, media interviews, and talking science with skeptical audiences. Additional skill-building and networking opportunities included program orientation, science communication practice with the interim University president, and both writing and peer-reviewing articles for the SoGES blog.

SINCE INITIATION OF THE SLF PROGRAM IN 2011...

220
Fellows trained

from
33
departments

across
7
colleges

ANGLES NETWORK PREPARES FUTURE LEADERS

SoGES co-leads and is the administrative home of ANGLES – a network of universities in the U.S. and Canada working together to accelerate and improve sustainability-focused leadership development in graduate education. **Aleta Rudeen Weller**, SoGES Senior Research and Engagement Officer, is the steering committee chair of the network.

Making progress on sustainability challenges depends on people who have both deep expertise and leadership capabilities. The world needs leaders with additional skills beyond those in their degree program; skills that can help them apply their knowledge effectively, understand stakeholder needs, work collaboratively, communicate outside their discipline, make decisions in the face of ambiguity, be adaptable and resilient, affect policy, foster equity and justice, and more.

ANGLES aligns the diverse efforts to develop graduate students as sustainability leaders and societal change agents. By providing a framework for mentorship, sharing best practices and curriculum, expanding and combining ideas in novel ways, the network raises the impact of individual graduate leadership programs and expands the landscape of training opportunities.

SoGES believes there can never be too many experts with the tools and skills to fight for a more sustainable world. As a leader of ANGLES, SoGES helps and supports emerging sustainability leadership programs, and leverages the network for ideas to improve the SoGES Sustainability Leadership Fellows program.

CENTERS & INITIATIVES

Africa Center | africacenter.colostate.edu

Leading change for sustainable African ecosystems and societies

The Africa Center, led by **Kathleen Galvin** (Professor, Department of Anthropology and Geography, University Distinguished Professor, SoGES Assistant Director of Educational Programs), is a community of CSU faculty, students, community members, and African partners who are addressing issues of sustainability of environments and society across the African continent. The mission of the center is to foster environmental, economic, and social sustainability through teaching, research, and engagement. The research and engagement of faculty and student participants extends from art, to history, to biodiversity conservation to veterinary medicine. The Center hosts Global Symposia featuring leaders from Africa, talks by CSU and non-CSU scholars, panels on timely topics, monthly networking coffee socials, an end-of-year Africa and Ale event and co-sponsors events with other units on campus. The center's monthly newsletter has about 600 subscribers, and it has about 308 Facebook followers, 407 Twitter followers, and about 209 followers on Instagram.

2022-23 Activity

- Initiation of new **graduate student scholarships**: Thanks to the generosity of a single donor, the center was able to award a total of $20,000 to ten graduate students to support their research in Africa ($2,500 per student/joint application)
- **Field Notes** is a platform for CSU researchers to highlight their work in detail and discuss cross cutting themes such as ethical cross-cultural research, interdisciplinary collaboration and community-based research. This year five podcasts/blogs were produced by students and professors.

Global Biodiversity Center | biodiversity.colostate.edu

To advance understanding, conservation, and appreciation of life's variation, ranging from genetics and organisms to ecosystems and their interactions

The Global Biodiversity Center is at an exciting crossroads as we develop a new vision and strategy to maximize CSU's impact in biodiversity research, policy, and outreach. During the GBC's 7 years, we have been particularly successful in connecting CSU biodiversity researchers from several different colleges to each other to facilitate interdisciplinary collaborations, and in outreach to the Fort Collins community in the form of symposia, panels, and internationally renowned guest speakers.

Moving forward, the GBC plans on significantly increasing its focus on the science-policy interface to make sure that CSU's top-notch biodiversity researchers have the opportunity to inform national and international biodiversity policy. It is increasingly recognized that the climate and biodiversity crises are inextricably interlinked. Mitigating and adapting to climate change cannot be achieved without also dramatically curbing biodiversity loss. As a first step in moving the GBC in this direction, the Director of the GBC, **Chris Funk** (Professor in the Department of Biology), is focusing his efforts on becoming intimately familiar with the US and international biodiversity policy landscape to identify opportunities for CSU researchers to have a positive impact.

Over the last year, he has worked with international and national scientists and policy makers to develop the new Global Biodiversity Framework as part of the Convention on Biological Diversity; improve integration of the Global Biodiversity Framework and the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services; and improve incorporation of genetic considerations into US Endangered Species Act listing and delisting decisions in collaboration with US Fish and Wildlife Service biologists. We are excited to harness CSU's globally recognized expertise in biodiversity research to bend the curve in biodiversity loss for the well-being of both nature and people.

Global Soil Biodiversity Initiative | globalsoilbiodiversity.org

An ongoing worldwide effort to plan and coordinate soil biodiversity research and support soil biodiversity for the benefit of people and ecosystems

Leadership

Diana H. Wall (Scientific Chair), Colorado State University, United States
Monica A. Farfan (Executive Director), Colorado State University, United States

GLOBAL SOIL BIODIVERSITY INITIATIVE

SoGES houses the secretariat of The Global Soil Biodiversity Initiative (GSBI), the preeminent independent scientific group dedicated to the inclusion of science-based information on soil biodiversity and soil ecosystems in environmental policy and land management decision-making. A volunteer scientific body of experts from around the world, GSBI's 4000+ members investigate the biodiversity in soil and, through innovative research programs, measure how soil life and ecosystem functioning responds to environmental change. Members include those investigating taxonomy, soil health, biogeochemistry, anthropogenic causes of loss of soil habitat to develop education and communication programs, and develop policy. The GSBI actively pursues the cross-engagement of policy and scientific communities to build capacity across the wide range of biodiversity science.

2022-23 Activity

- Partners with international agencies and governing bodies such as the UN CBD, UN-FAO, and the European Commission
- Partners with and participates in research, innovation, education programs; such as SoilBON (Soil Biodiversity Observation Network)
- Serves as the central global forum to provide opportunities for the multidisciplinary soil biodiversity community to share and accelerate knowledge on advancements and solutions in biodiversity research and related sciences
- Enables cross-collaboration by working with the Global Biodiversity Information Facility (GBIF) supporting online data-sharing opportunities and increasing accessibility to benefit the soil biodiversity community network
- Aims to develop knowledge to conserve and protect soils and soil biodiversity

Global Soil Biodiversity Conference

The Global Soil Biodiversity Conference is the flagship event of the Global Soil Biodiversity Initiative (GSBI). The conference, held for the third time on 13-15 March, 2023, attracted about 650 of the world's leading soil biodiversity experts from more than 120 different countries. It was hosted by University College Dublin (UCD) and Teagasc, the Agriculture and Food Development Authority of the Republic of Ireland. The conference was co-chaired by Tom Bolger, UCD Emeritus Professor and SoGES Director **Diana Wall**, who is the Science Chair of the GSBI.

The event's theme was "Science as a basis for the sustainable use and conservation of soil biodiversity," reflecting both the increased understanding of the importance of soil biodiversity in food security and climate regulation and the recent intensification of international efforts to safeguard soil health. Attendees included students, scientists, policy-makers, regulators, environmental agencies, conservationists, land use managers, and other stakeholders in the sustainable use and conservation of soil biodiversity.

Numerous presentations addressed new advances in soil biodiversity research and ecological understanding. Other important topics included potential biodiversity benefits of the new European Union (EU) Soil Strategy and efforts to mainstream soil biodiversity science and assist policymakers in developing soil protections through the United Nations Food and Agriculture Organization's International Network on Soil Biodiversity (NETSOB) and the Global Soil Biodiversity Observatory (GLOSOB).

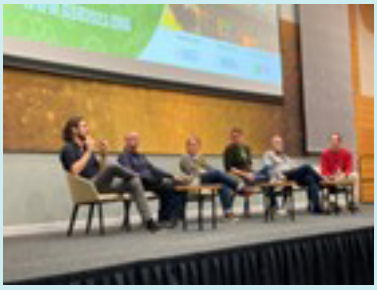


Photo: Discussion panel on the final day with keynote speakers and experts

CENTERS & INITIATIVES

Student Sustainability Center

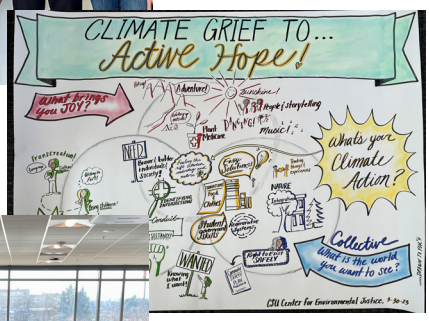
A University-wide, student run organization whose mission is to empower students to advance sustainability practices and principles.

The Student Sustainability Center (SSC) supported by SoGES, which includes undergraduate and graduate chapters, is the home of student-led sustainability advocacy at CSU. The SSC leads innovative initiatives, pushes stronger campus sustainability policy, hosts topical events, distributes information, and builds cooperative community relationships.

SSC Undergraduate Student Chapter

Undergraduate director **Sam Moccia** (major: Agriculture and Resource Economics) graduated from CSU and welcomed **Reaghan Fields** (major: International Studies) as the incoming Director.

Over the course of the 2022-2023 academic year, the SSC's presence on campus and in the community grew significantly. The SSC supported students during move-in with recycling support, advocating for clean energy, and collaborating with other student groups to clean up campus and surrounding areas.



Photos: students engage with faculty during Climate Grief and Resiliency workshop

Photos: students gather during outreach and park clean-up events

2022-2023 Highlights:

- Held a kick-off outreach event on the oval to discuss SSC- its purpose, plans, and ways for students to get involved.
- Hosted a community cleanup at a local park that 50 students attended. Over the course of two hours, they were able to collect 167 pounds of trash!
- Worked with **The Patchwork Initiative** to cohost a clothing swap and mending workshops on campus along with other sustainability centers.
- Hosted a winter sports event that addressed the climate crisis and how it affects winter sports. Students were highly engaged and left the event with action items and feeling hopeful.
- SSC Instagram followers increased to 1154, and email subscribers increased by over 150.
- Collaborated with the Center for Environmental Justice to host the first *Climate Grief and Resiliency workshop*.

SSC Graduate Student Chapter

2022-2023 Highlights:

- Outreach at Futures Lab, Timnath Middle-High School. SSC graduate students volunteered their time to meet with students interested in learning more about sustainability.
- Connected with numerous local sustainability advocacy organizations and supported student outreach at multiple tabling events.
- Hosted a lunchtime event with undergraduate SSC at the on campus Poudre School District Climate Leadership Summit, co-organized by SoGES, to chat with high school students about research and sustainability efforts at CSU and beyond.

Looking ahead:

- Outreach to sustainability-related courses at CSU. Increase exposure to undergraduates to discuss what graduate school is like.
- Work alongside the undergraduate SSC to write proposals to fund student related sustainability initatives on campus.

Photo: SSC Undergraduate and Graduate Students present host lunchtime event at Climate Leadership Summit for high school students

Photo: SSC Graduate students present sustainability concepts to high school students

Q&A with Graduate Student Sustainability Center Director, Jacob VanderRoest, Graduate Student, Department of Chemistry:

What projects or events were you most proud of?

Without a doubt, working with high school students on the climate leadership summit was the highlight of the year. This year the SSC grad chapter hosted a lunch session where high school students had the opportunity to chat directly with the graduate students.

You're now two years into the Graduate SSC, what have you learned in the time you've been director?

I learned that CSU is incredibly supportive of all sustainability-related initiatives. I expressed interest in starting this group, and SoGES provided all of the resources and contacts required to get it off the runway. It's truly a blessing to be part of an institution that sincerely prioritizes sustainability.

In what capacity do you work with the undergraduate SSC?

I worked closely with the undergraduate SSC during the climate summit planning process. Sam Moccia and I would meet frequently with high school student organizers and Tory Nau (Poudre School District) in the months leading up to the event. Additionally, both undergraduate and graduate students volunteered their time during the lunchtime session during the summit.

Did you do anything for the first time? How did it go?

This year, the SSC Grad Chapter started going to local high schools to chat with students about our research and sustainability. I reached out to this year's organizer of the climate summit to coordinate these visits and she was very enthusiastic about us coming to her class. The high school students asked great questions, and I was very appreciative of the graduate students offering their time to participate.

ENGAGEMENT

SoGES places high priority on identifying and addressing societal needs, both within our local region, and at the national and global level. Maintaining a robust dialogue among students, faculty, and stakeholders beyond the University helps us understand problems and investigate potential solutions.

COMMUNICATIONS

4,547
Email Subscribers

Social Media
2,002 Facebook Followers
2,944 Twitter Followers

107
YouTube Subscribers

Events

Managing the Planet Panel Discussions

Interactive public events that address a wide range of sustainability issues. Each features a panel of CSU experts who field questions from community members and students. **The four panels held during 2022-23 attracted about 260 participants.**

Sept. 11 **Overconsumption: What can we do?** Panelists**: Susan Golicic**, Dept. of Management; **Joe Scalia IV**, Dept. of Civil and Environmental Engineering; **Meagan Schipanski**, Dept. of Soil and Crop Sciences; **Terry Yan**, Dept. of Design and Merchandising

Oct. 12 **WOMEN: Key to the sustainable development goals.** Panelists: **Meena Balgopal**, Dept. of Biology; **Elissa Braunstein**, Dept. of Economics; **Russ Schumacher**, Dept. of Atmospheric Science; **Camille Stevens-Rumann**, Dept. of Forest and Rangeland Stewardship

Feb. 8 **Safeguarding the Future: CSU Perspectives on the COP 27 Global Climate Negotiations.** Panel One Panelists: **Peter Backlund**, SoGES; **Hussam Mahmoud**, Dept. of Civil and Environmental Engineering; **Courtney Schultz**, Dept. of Forest and Rangeland Stewardship; **Aleta Weller**, SoGES

Panel Two Panelists: **Gillian Bowser**, Dept. of Ecosystem Science and Sustainability; **Nicki Bailey** and **Alyssa Connaughton**, graduate students, Dept of. Ecosystem Science and Sustainability; **Jorge Rico Reyes**, graduate student, Dept. of Civil and Environmental Engineering

Mar. 8 **The Renewable Energy Transition and what it means for Colorado.** Panelists: **Jesse Burkhardt**, Dept. of Agricultural and Resource Economics; **Ellison Carter**, Dept. of Civil and Environmental Engineering; **Carol Dollard**, CSU Facilities Management; **Mark Uchanski**, Dept. of Horticulture and Landscape Architecture

Antarctic Lecture Series

Lectures featuring Antarctic researchers who describe various aspects of life, work, and conducting science "on the ice." Approximately **100 people attended** the 2022-23 lectures, held at the Old Town Library.

Sept. 20 **My nematode teacher: Lessons from Antarctic soil nematodes on how to isolate from Covid.** Abigail Jackson, BYU

Nov. 15 **Recent Scientific Advances for the International Thwaites Glacier Collaboration** Ted Scambos, CU Boulder

Feb. 28 **The Changing Ecosystems and its Effect on Top Level Predators in the Antarctic.** Shane Kanatous, CSU

Symposia and Special Events

Oct. 25 **Book launch and author reception** Sociologists **Stephanie A. Malin** and **Meghan Elizabeth Kallman** demonstrate how communities adapt in the face of crisis and explain that sociology can help us understand how and why they do this challenging work in their new book *Building Something Better: Environmental Crisis and the Promise of Community Change*

Photo: Author Stephanie Malin reads an exerpt during author reception

Photos: (above) **Dr. Pat Keys** provides opening keynote during Climate Leadership Summit
(below) **Dr. Gene Kelly** provides closing keynote

Apr. 19 **Climate Leadership Summit** Partnered event with Poudre School District gathered 400 students from across the state to provide a forum to educate high school students on climate and sustainability. Speakers included: **Pat Keys**, Dept. of Atmospheric Science; **Sonali Diddi**, Dept. of Design and Merchandising; **Katie McShane**, Dept. of Philosophy; **Stephanie Malin**, Dept. of Sociology; **Tony Cheng**, Dept. of Forest & Rangeland Stewardship; **Colleen Duncan**, Dept. of Microbiology, Immunology, and Pathology; **Meagan Schipanski**, Dept. of Soil and Crop Sciences; **Andrew Seidl**, Dept. of Agricultural and Resource Economics; **David Rojas-Rueda**, Dept. of Epidemiology; **Russ Schumacher**, Dept. of Atmospheric Science; **Becky Bolinger**, Colorado Climate Center; **Ryan Scott**, Dept. of Political Science; **Iasmin Goes**, Dept. of Political Science; **Jason Quinn**, Dept. of Mechanical Engineering; **Hussam Mahmoud**, Dept. of Civil and Environmental Engineering; **Eugene Kelly**, SoGES Faculty Research Liaison, Associate Dean of Extension, College of Agricultural Sciences

Africa Center Lectures

Lectures to facilitate a forum for issues of African biodiversity, conservation, and sustainability.

Oct. 19 **International Development while Immersing in East Africa- Info Session Jamie Van Leeuwen**, Emerson Collective

Nov. 2 **In Rwanda, Love Grows Where Hope Shines Philip Mulari**, Mission of Hope Shines, Rwanda

Nov. 15 **Key Resources Competition Threatens Viability of the Critically Endangered African Wild Ass Population on Messir Plateau Redae Tesfai**, visiting researcher from Eritrea

Nov. 30 **Bringing Society into Climate Science and Shifting Power Relationships Bruce Hewitson**, University of Cape Town, South Africa

Feb. 22 **Economic Justifications for Conservation- A Useful Tool but a Foolish Foundation Truman P. Young**, UC Davis

Mar. 31 **Towards more Collaborative Approaches for Natural Resource Management in Takama National Park, Cameroon Jerry Kirensky Mbi**, Ministry of Forest and Wildlife, Cameroon

Apr. 14 **Africa & Ale**

WHO WE ARE

About the School

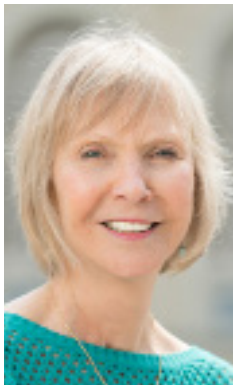
The School of Global Environmental Sustainability (SoGES) was created in 2008 to advance sustainability research, education, and engagement at Colorado State University. The school is a Special Academic Unit attached to the Office of the Provost and Executive Vice President that works with and across the University's eight colleges.

SoGES brings together researchers, teachers, students, and stakeholders to address one of the greatest challenges of the coming century: preserving our planet's environmental quality while meeting the human and societal needs of today and tomorrow. Our approach to this challenge is centered on exploring, documenting, and explaining the links between environmental, societal, and economic sustainability, and fostering ongoing dialogue about choices, trade-offs, and solutions.

The SoGES Mission

- **Conduct innovative research that transcends boundaries and leads to new and deeper understanding of sustainability issues**
- **Provide a challenging, integrative, and provocative education that gives future leaders knowledge and tools that enable them to contribute to environmental sustainability**
- **Engage with the public and decision-makers in translating discoveries into useful information and practical solutions to pressing environmental problems**

The challenge of achieving sustainability is inherently interdisciplinary, requiring the development and integration of knowledge, perspectives, and understanding from the natural and social sciences, engineering, business, art, and the humanities. The CSU faculty members who are affiliated with and contribute to SoGES include experts from all of these intellectual domains. Promoting and supporting discussion, connection, diversity, inclusivity, and collaboration across disciplinary and institutional boundaries is one of our School's most important functions.



Diana H. Wall, Director

Diana is a CSU University Distinguished Professor, Professor of Biology, and Director of the School of Global Environmental Sustainability (SoGES). Since the founding of SoGES in 2008, Diana has been a driving force for connecting CSU faculty, researchers, and students to address the world's greatest sustainability challenges. An ecologist, she is recognized for her work on soil biodiversity and climate change impacts in the Antarctic dry valleys. Wall Valley, Antarctica was designated for her contributions. Diana was president of several scientific organizations such as AIBS, Society of Nematologists, and the Ecological Society of America. She received the 2013 Tyler Prize for Environmental Achievement, the Ulysses Medal, University College Dublin, the 2019 President's Medal of the British Ecological Society and is an elected member of the National Academy of Sciences. She earned her Ph.D. at the University of Kentucky.

Leadership

Peter Backlund, Associate Director

Peter is a science and policy researcher whose primary interests include the intersection of global change and environmental sustainability, use of scientific information for decision-making, assessment of climate change vulnerability and impacts, and evaluation of adaptation and mitigation options. His recent work has focused on understanding and documenting the impacts of climate change on food systems and food security. Before joining CSU, he held senior positions at the US National Center for Atmospheric Research, the White House Office of Science and Technology Policy, and NASA. Peter is a fellow of the American Association for the Advancement of Science and a 2016 recipient of the Abraham Lincoln Honor Award from the US Department of Agriculture. He received his B.A. from the University of New Mexico and his M.A. from The George Washington University.

Kathleen Galvin, Assistant Director of Educational Programs

Kathy is a Professor of Anthropology, Senior Research Scientist at the Natural Resource Ecology Laboratory, Director of The Africa Center, and an advising faculty member in the CSU Graduate Degree Program in Ecology. She conducts interdisciplinary human-ecological research in Africa and Asia and is interested in pastoral land use, conservation, climate variability, resilience, dryland adaptation strategies, and household decision-making under environmental uncertainty. Kathy has served on many National Research Council and National Science Foundation panels and is an Aldo Leopold Leadership Fellow. She is a Lead Author on the 2019 Global Assessment on Biodiversity and Ecosystem Services for the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services. Her B.A. and M.A. are from CSU and her Ph.D. is from Binghamton University.

Eugene Kelly,
Faculty Research Liaison

Gene is a Professor of Pedology, Deputy Director of the CSU Agricultural Experiment Station, Associate Dean for Extension in the College of Agricultural Science, and former head of CSU's Department of Soil and Crop Sciences. His scientific specialization is in Pedology and Geochemistry and his current research centers on the influence of climate change and land use on soil degradation and sustainability in water-limited systems. He is a current advisor to the US Department of Agriculture's National Cooperative Soil Survey and the National Ecological Observatory Network. He is a fellow of the Soil Science Society of America and a recipient of the prestigious Soil Science Society of America Research Award. He received his B.S. and M.S. degrees from CSU and his Ph.D. from the University of California-Berkeley.

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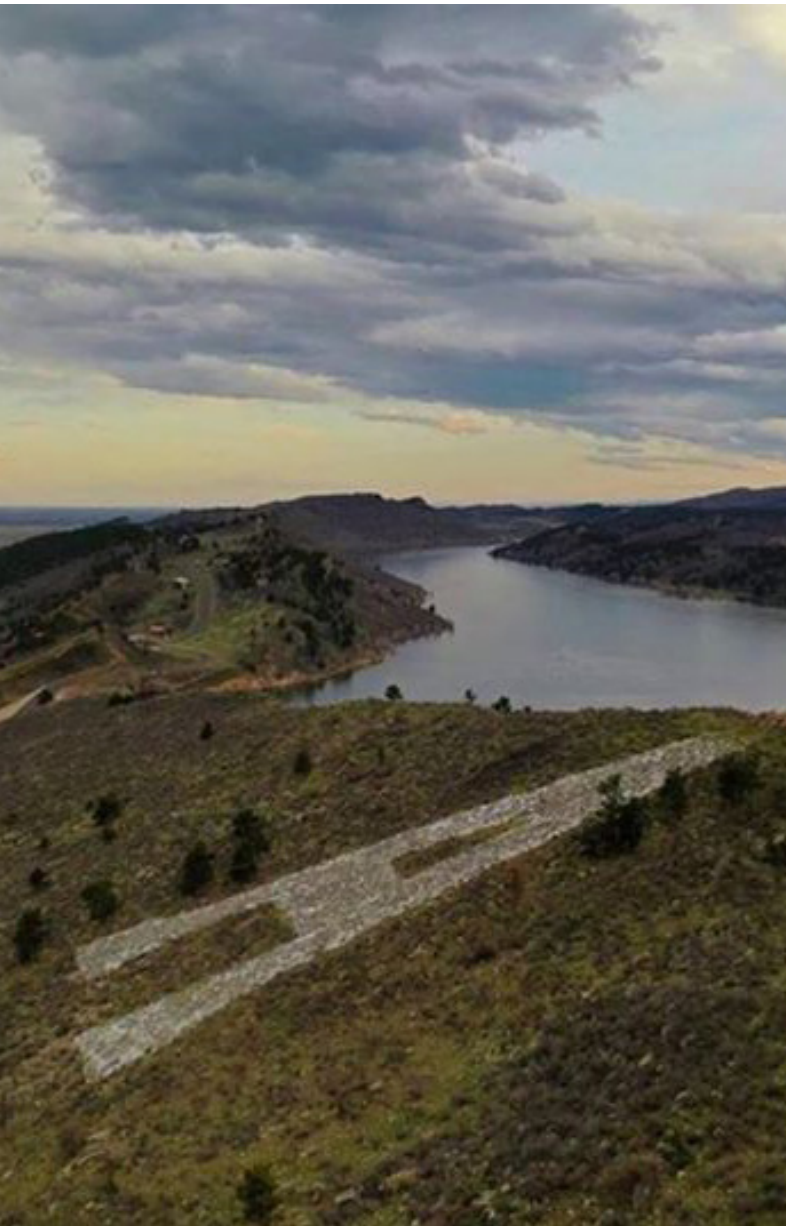
Jan Leach, Agricultural Biology
Kelly Martin, Marketing
Dennis Ojima, Natural Resource Ecology Laboratory
Kenneth Reardon, Chemical and Biological Engineering
David Rojas, Environmental and Radiological Health Sciences
Elizabeth Ryan, Environmental and Radiological Health Sciences
Dave Thompson, Atmospheric Science
Joe Von Fischer, Biology

WHO WE ARE



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Sam Moccia, Outgoing Director, Student Sustainability Center
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Laura Shaver, Program and Events Manager
Jacob VanderRoest, Director, Student Sustainability Center Grad Chapter
Aleta Rudeen Weller, Senior Research and Engagement Officer

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Edward B. Barbier, University Distinguished Professor, Department of Economics, Colorado State University

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Ruth Hufbauer	Agricultural Biology
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Mary-Ann Kokoska	Art and Art History
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Scott Denning	Atmospheric Science
Emily Fischer	Atmospheric Science
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Sonia Kreidenweis	Atmospheric Science
Kristen Rasmussen	Atmospheric Science
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Steven Fonte	Soil and Crop Sciences
Eugene Kelly	Soil and Crop Sciences
Susan Melzer	Soil and Crop Sciences
Keith Paustian	Soil and Crop Sciences
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Thomas Borch	Soil and Crop Sciences & Chemistry
Daniel Cooley	Statistics
Donald Mykles	University Honors Program
Jennifer Barfield	Veterinary and Biomedical Sciences

Finance Report

Description	Budget	Expenses	Credits
FY 2022-2023 Base Budget	$1,072,720.00		
Salaries			
Director, Associate Directors		$479,790.00	
Staff		$450,411.00	
Student Hourlies		$3,785.00	
SALARIES TOTAL		**$933,986.00**	
Program Activities			
Research			
Global Challenges Research Teams (awarded $30,000)		$18,450.00	
Resident Fellows		$31,000.00	
Total		**$49,450.00**	
Sustainability Leadership Fellows program			
Science Communication Workshop, Trainings, and Year Operations and Supplies		$34,313.00	
Total		**$34,313.00**	
Global Soil Biodiversity Initiative			
Operating and salaries (travel, workshops, etc.)		$58,815.00	
Total		$58,815.00	
Education			
GES Traditional and Online Courses (Professors, GTAs, tuition, supplies, etc.)		$160,591.00	
Sustainability Curriculum Innovation Grants (awarded $60,250)		$51,029.00	
Total		**$211,620.00**	
Student Sustainability Center			
Salaries		$3,570.00	
Operations and Events		$2,107.00	
Total		**$5,677.00**	
PROGRAM ACTIVITIES TOTAL		**$359,875.00**	
General Administration			
Supplies		$22,048.00	
Operating Charges (Events, Phone, Data, Etc.)		$31,151.00	
Travel		$18,733.00	
General Administration Total		**$71,932.00**	
EXPENSE TOTAL		**$1,365,793.00**	
Miscellaneous Income			
1X Monies			$131,330.00
1X Monies from Presidents Office and Presidents Sustainability Commission			$130,000.00
Differential Tuition			$18,918.00
FY22 Carryforward			$86,810.00
Overhead budget return from grants			$24,021.00
Misc out to other departments			($40,000.00)
Online Courses Revenue			$22,034.00
Salary Savings From Grants			$3,585.00
Balance for Future Commitments in FY24			**$83,625.00**

INVEST IN A SUSTAINABLE FUTURE

The School of Global Environmental Sustainability facilitates vital sustainability research, educates future sustainability leaders, and brings important sustainability knowledge to the community with outreach and engagement.

- **The School's researchers, from artists to ecologists and many other varied fields of study, are working together across knowledge domains to understand the changing intersections of climate change, biodiversity loss, food security, disease, air quality, and more.**
- **Sustainability is increasingly a factor in every sector, and it's critical that we prepare CSU students to understand sustainability as they move into the workforce. The School offers coursework and a minor in Global Environmental Sustainability, available to CSU students from any major.**
- **The School helps connect CSU to our local community and Colorado at large by hosting numerous events throughout the year. SoGES sustainability events attract on average 4,000 attendees each year.**

Donations play a key role at SoGES. Your support means we can tackle the sustainability challenges facing our world – today, tomorrow, and into the future. Please consider a gift to make an impact in sustainability.

Gifts can be general in nature or dedicated to any activity listed in the annual report. Thank you for considering a donation.

https://advancing.colostate.edu/SOGES/GIVE

SCHOOL OF GLOBAL
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