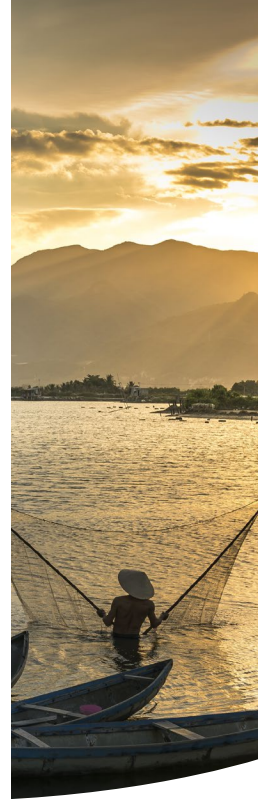




SCHOOL OF GLOBAL  
ENVIRONMENTAL SUSTAINABILITY  
COLORADO STATE UNIVERSITY



2017-18 Annual Report





# SCHOOL OF GLOBAL ENVIRONMENTAL SUSTAINABILITY

## 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, and collaboration across disciplinary and institutional boundaries is one of our School's most important functions.

## Leadership



### Diana H. Wall, Director

Diana is a University Distinguished Professor and Professor of Biology at CSU and Science Chair of the Global Soil Biodiversity Initiative. She is a soil ecologist whose research explores how microbial and invertebrate diversity contributes to healthy, fertile and productive soils and thus to society, and the consequences of human activities on soil globally. Her work on soil biota, particularly soil nematodes, extends from agro-ecosystems to Antarctica. Diana was elected to the U.S. National Academy of Sciences in 2018. She also received the 2017 Eminent Ecologist Award from the Ecological Society of America, the 2016 Honorary Member award from the British Ecological Society, the 2015 Ulysses Medal from University College Dublin, the 2013 Tyler Prize for Environmental Achievement, the 2012 SCAR President's Medal for Excellence in Antarctic Research, and the 2013 Soil Science Society of America Presidential Award.



## RESEARCH pages 4-9

In fiscal year 2017-18, the School funded **4 research teams, 6 faculty fellows and supported 3 centers, 2 working groups and 2 international initiatives**

## Leadership



**Peter Backlund**, Associate Director

Peter is a science and policy researcher whose current focus is assessing the impacts of climate change on people, society and ecosystems. Before joining CSU, he held senior positions at the U.S. 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 U.S. 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 Professor of Anthropology, Senior Research Scientist at the Natural Resource Ecology Laboratory, Head of the CSU 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. 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 an advisor to the United States Department of Agriculture's National Cooperative Soil Survey and a fellow of the Soil Science Society of America. He received his B.S. and M.S. degrees from CSU and his Ph.D. from the University of California-Berkeley.

## Executive Council

**Michele Betsill**, Department of Political Science

**Thomas Borch**, Department of Soil and Crop Sciences

**Joe Champ**, Department of Journalism and Media Communication

**Tom Dean**, Department of Management

**Brian Dunbar**, Institute for the Built Environment

**Chris Funk**, Global Biodiversity Center

**Alan Knapp**, Graduate Degree Program in Ecology

**Jan Leach**, Department of Bioagricultural Sciences and Pest Management

**Barry Noon**, Department of Fish, Wildlife, and Conservation Biology

**Dennis Ojima**, Department of Ecosystem Science and Sustainability

**Kenneth Reardon**, Department of Chemical and Biological Engineering

**Elizabeth Ryan**, Department of Environmental and Radiological Health Sciences

**Dave Thompson**, Department of Atmospheric Sciences

**Joe Von Fischer**, Department of Biology

## EDUCATION pages 10-13

In fiscal year 2017-18, the School experienced an **enrollment increase of 18%**. The number of students who graduated with a GES minor **increased 21% from 2016-17**

## ENGAGEMENT pages 18 & 19

In fiscal year 2017-18, the School experienced a **33% increase in email subscribers, 9% increase in Facebook likes and 8% increase in Twitter followers**



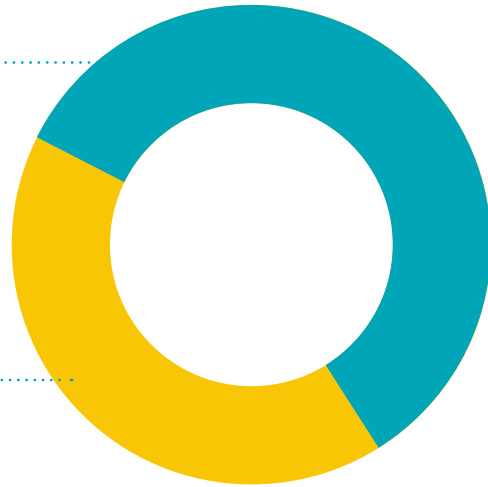
# RESEARCH

# \$95,000

 awarded

Global Challenges  
Research Teams and  
Working Groups  
\$51,400

Resident Fellows  
\$43,600



## Global Challenges Research Teams

Collaborative teams of CSU faculty, students and community members who build cross-campus partnerships to address the world's most pressing regional and global sustainability issues. The program provides seed funding to foster creative and innovative approaches and establish new interdisciplinary relationships to conduct research with expanded applicability.

fy 18

4

teams

31

PIs

24

depts

6

colleges

since 2008

39

interdisciplinary research  
teams from 46 departments  
across 8 colleges





SoGES GCRT Clothing and Sustainability "Clothes Mending Café" booth

## Clothing and Sustainability: Policy Implications through Structured Public Deliberation

Principal Investigators:

- Brittany Bloodhart**, Department of Atmospheric Science
- Martin Carcasson**, Department of Communications Studies
- Sonali Diddi**, Department of Design and Merchandising
- Katie McShane**, Department of Philosophy
- Susan Opp**, Department of Political Science
- Ruoh-Nan (Terry) Yan**, Department of Design and Merchandising

The *Clothing and Sustainability* GCRT worked with local community stakeholders and conducted research to understand the lifecycle of clothing. They examined post-consumer textile waste management practices and community perceptions lifecycle in order to develop evidence-based policy recommendations. Accomplishments included:

- Collection of information on current policies on textile recycling and textile waste management practices at city and county levels in the U.S. in order to help develop policy recommendations for the City of Fort Collins.
- Investigation of stakeholder perceptions about the acquisition, use and disposal of clothing by conducting interviews with City of Fort Collins sustainability department managers and second-hand clothing business owners and employees; and surveying community members.
- Multiple outreach events to create awareness about the environmental and social impacts of clothing consumption and disposal, including a booth at the Sustainability Living Association's "Clothes Mending Café" that had ~200 visitors and a clothing swap that had ~300 participants.

## Northern Colorado Sustainable Analysis Network

Principal Investigators:

- Shawn Archibeque**, Department of Animal Sciences
- Thomas Bradley**, Department of Mechanical Engineering
- Michael Carolan**, Department of Sociology
- Richard Conant**, Department of Ecosystem Science and Sustainability
- Marco Costanigro**, Department of Agricultural and Resource Economics
- William Parton**, Natural Resource Ecology Laboratory
- Ken Reardon**, Department of Chemical and Biological Engineering
- Molly Saylor**, City of Fort Collins
- John J. Sheehan**, Department of Soil and Crop Sciences

The *Northern Colorado Sustainable Systems Analysis Network* GCRT connected Northern Colorado local governments with sustainable systems analysts at CSU to evaluate strategies for climate mitigation, waste reduction, and water conservation. The team delivered new research tools and data to CSU researchers and took steps toward establishing a cost-sharing arrangement for maintaining campus-wide access to sustainability data and software. They also engaged CSU students in sustainable systems analyses that addressed real community and local government challenges for sustainable development. Key accomplishments included:

- Acquisition and evaluation of a global database of life cycle information covering resource, energy, economic, and environmental flows associated with thousands of products, processes, and services.
- Evaluation and application of an open source software package for conducting life cycle assessments in conjunction with the aforementioned global database as well as others.
- Completion of a student intern-led analysis of the life cycle implications for integration of battery storage technologies at various stages within the City of Fort Collins electric utility system and preliminary work on a life cycle assessment of printer cartridge use, reuse, and recycle options for the City of Fort Collins.
- Acquisition of a new social life cycle inventory database that will be evaluated and used in classrooms in the 2018-2019 academic year.





## Global Challenges Research Teams, cont.

### Enhancing Community Well-being through Horticulture and Design

Principal Investigators:

**Chris Bell**, Department of Health and Exercise Science

**Albert Bimper**, Department of Ethnic Studies

**Alessandro Bonanno**, Department of Agricultural and Resource Economics;

**Jessica Davis**, Department of Horticulture and Landscape Architecture

**Brian Dunbar**, Institute for the Built Environment

**Chris Melby**, Department of Food Science and Human Nutrition

**Sybil Sharvelle**, Department of Civil and Environmental Engineering

**Lorann Stallones**, Colorado School of Public Health

**Michael Steger**, Department of Psychology

The *Enhancing Community Well-being through Horticulture and Design* GCRT focused on sustainability challenges of urban environments, including parks, community gardens, playgrounds, sports fields, green spaces, and natural settings, all of which contribute to individual and community well-being and have wide-ranging impacts on physical, mental, and emotional health. The team held two events around urban sustainability:

- A panel discussion at Avogadro's Number, *Urban Green Spaces: Boosting Community Well-being through Horticulture and Design* included panelists Kathleen Wolf (University of Washington), Alison O'Connor (CSU Extension in Larimer County), Jen Boussetot (Horticulture at CSU), and Brad Goetz (Landscape Architecture at CSU).
- A workshop for ~50 people to brainstorm ways to collaborate to enhance urban communities through horticulture and urban design. This included participants from the Parks, Forestry, and Water Conservation units of Fort Collins, Loveland, Westminster, and Denver; non-profits such as Groundwork, Denver Food Rescue, High Plains Environmental Center, and Food Bank of the Rockies; and schools from Denver and Jefferson Counties.

### Crisis and Creativity

Principal Investigators:

**Edward K. Hall**, Department of Ecosystem Science and Sustainability and Natural Resource Ecology Laboratory

**Dan Beachy-Quick**, Department of English

**Cedar Brant**, Department of English

**María Fernández-Giménez**, Department of Forest and Rangeland Stewardship

**Stewart W. Breck**, USDA-WIS-National Wildlife Research Center

**Christopher Schell**, Department of Biology

**Felicia Zamora**, Continuing Education

The *Crisis and Creativity* GCRT was a collaboration of faculty in natural sciences and humanities aimed at addressing the increasing threat that species loss poses to global environmental sustainability. The team developed a multi-media exhibition of art and nested educational outreach activities to translate the current biodiversity crisis through visual, audio, and textual installations and performances aimed at a public audience. Accomplishments included:

- Collaborating with the Fort Collins Center for Fine Art Photography to create an art installation, displayed during April 2018 at the center's gallery in downtown Fort Collins, that juxtaposed a list of extinct species with panels showing deletions of text from the Bible's Genesis story.
- Creation of a 5-minute performance piece, which applied the "same loss" algorithm to a piece of music and an image while team members simultaneously read aloud the erasure from Genesis and a list of species that have gone extinct during the past 140 years. This was performed as part of the SoGES Global Biodiversity Center Ignite talks held annually at Avogadro's number.



### New Research Activity

SoGES Research scientist Pat Keys, Assistant Director Kathy Galvin, and colleagues from several CSU departments received \$22,358 grant from the CSU Water Center to examine interactions among Kenyan climate, land, and people to better understand how the achievement of the Sustainable Development Goals may have unexpected benefits and consequences.

*Photo caption: Maasai livestock owner herding his cattle in Maasai Mara, Kenya (photo by Paul Evangelista)*

## Resident Fellows

Faculty members engaged in creative sustainability research and problem solving. We provide seed funding to enhance scholarly contributions to sustainability, accelerate progress, and engage in the academic life of the School.

### **Thomas Dean** Department of Management

Tom Dean's Fellowship focused on investigating what happens when larger corporations acquire smaller sustainable enterprises in the natural and organic product space. Early versions of his research were presented at two major conferences. He and a colleague then completed a paper on this topic that is now in second review. He also developed a new connection with Ed Barbier (CSU Professor of Economics and SoGES Senior Scholar) and Jo Burgess (CSU Assistant Professor of Economics and SoGES Faculty member) based on their mutual interest the potential of private sector investment as a means of helping to preserve biodiversity. This new collaboration resulted in two presentations and the writing of a perspectives article that was published in *Science*.

### **Sophie Esch** Department of Languages, Literatures, and Cultures

Sophie Esch's Fellowship research explored the link between wildlife and drug trafficking in Latin American culture as part of her overall effort on a book about ecological, political, and aesthetic implications of three major commodities that flow from and to Latin America: drugs, arms, and animals. In addition to progressing on her book, Sophie organized a symposium on "Environment and Conflict in Latin America," completed two articles (one published, one submitted), created an initial draft of a third article, and gave a presentation at a conference at UC Irvine.

### **Julia Klein** Department of Ecosystem Science and Sustainability

Julia Klein's Resident Fellowship provided the opportunity to further develop a feature-length documentary film. The film, titled SENTINELS, is the story of people in the Peruvian Andes grappling with the effects of climate change. Major accomplishments during the year included filming one of the main characters as they participated in the annual meeting of the Framework Convention on Climate Change in Bonn, Germany, editing, transcribing, and translating substantial amounts of footage, and obtaining a MountainFilm grant to support the project. Julia also worked with colleagues from the education and art departments to apply for a National Geographic STEAM education grant.

### **Anna Perry** Department of Apparel, Merchandising, and Design

Anna Perry's Resident Fellowship focused on exploring sustainable disposal methods from the perspectives of both designers and consumers and examining how such methods could be used to make sustainable smart clothing that meets meet consumer needs. During the year she received two International awards and published eight peer-reviewed journal papers, two peer-reviewed conference proceedings, and three peer-reviewed designs. She also displayed six invited designs, received an external grant on sustainable cotton, participated in an invited design research presentation, and had an abstract based on her SoGES project accepted for presentation at an international conference.

### **Andrew Seidl** Department of Agricultural and Resource Economics

Andy Seidl's Resident Fellowship supported his work on the United Nations Development Programme's Biodiversity Finance Initiative (BIOFIN) to create educational products and training on conservation finance and environmental mainstreaming. During the year, Andy published four journal articles, one book chapter, eight book length reports, two extension reports, made 30 professional presentations, testified at the Colorado legislature on Great Outdoors Colorado, developed (but not quite completed) a Massive Open Online Course on Biodiversity Finance, directly supported five countries (Malaysia, Indonesia, Fiji, Brazil and Belize) on implementation of the BIOFIN methodology.

### **Kenneth Shockley** Department of Philosophy

Ken Shockley's Fellowship involved an investigation into the connections between the reasons that move us as individuals and those that we use to justify policy decisions to one another, and how these connections shape our response to environmental problems. He continued to develop his book project, "The Environmental Moral Problem," which explores the differences between reasons that move us to act and those we use to justify our actions and policies. He also revised and resubmitted a paper on the role of narrative continuity in understanding how humans flourish through environmental change, presented a keynote for the annual meetings of the Texas ethics workshop, and presented another paper at a meeting of the American Philosophical Association, in San Diego, CA.

## Visiting Fellows

Visiting Fellows are faculty scholars from universities worldwide with expertise in broad areas of sustainability. They are housed at SoGES in order to collaborate and connect with CSU experts addressing economic, societal, and environmental issues.

### **Ademola Adenle** Nigeria | January 2016 - April 2018

Ademola Adenle has a multidisciplinary background that includes degrees in natural science, biotechnology, applied toxicology, and public policy. His current work on sustainable development is located at the interface of natural and social sciences and focuses on the role of science and technology policy for addressing sustainable development challenges.

### **Karen Scholthof** United States | summer 2017 and summer 2018

Karen Scholthof is a professor in the Department of Plant Pathology and Microbiology at Texas A&M University and the faculty director of the Bioenvironmental Sciences undergraduate honors program. Karen's work as a visiting fellow focused on exploring the history of plant virology and developing new lectures for her undergraduate course "Pathogens, the Environment and Society."



# RESEARCH

## Global Soil Biodiversity Initiative | [globalsoilbiodiversity.org](http://globalsoilbiodiversity.org)

The Global Soil Biodiversity Initiative (GSBI) is an ongoing worldwide effort to coordinate the actions of soil ecologists to support people and ecosystems. SoGES Director Diana Wall played a leading role in creating the initiative, which began in 2011, and currently serves as Scientific Chair. SoGES continues to host the GSBI secretariat and galvanize CSU participation in soil ecology and biodiversity research.

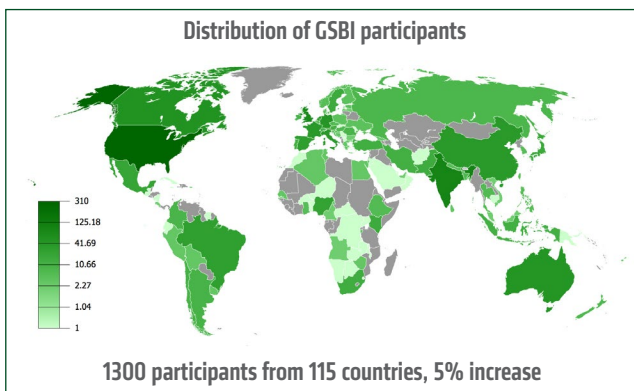
### Leadership

**Diana H. Wall (Scientific Chair)**, Colorado State University, United States  
**Elizabeth Bach (Executive Director - departed May 2018)**, Colorado State University, United States

### Online Engagement

- ▶ **5,420** Twitter followers, a 34 percent increase
- ▶ **5,010** Facebook followers, a 35 percent increase
- ▶ **3,810** Newsletter subscribers, an 10 percent increase
- ▶ **19,092** Website visits, a 63 percent increase

@theGSBI GlobalSoilBiodiversityInitiative



### 2nd Global Soil Biodiversity Conference

The GSBI held its 2nd Global Soil Biodiversity Conference in Nanjing, China on October 15-19, 2017. This gathering of experts from ecology, zoology, microbiology, soil science, and taxonomy had over 1000 participants from 47 countries, 22 keynote talks (including one from Diana Wall), and more than 100 oral presentations in 15 topical sessions.

### Science-Policy Feedback

The GSBI Secretariat provided expert reviews and input to the UN Convention to Combat Desertification Global Land Outlook (released in 2017), the Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES) Assessment on Land Degradation & Restoration (released in 2018), and the US Forest Service General Technical Report on Soils in Forests and Rangelands (released in 2018).

GSBI Executive Director Elizabeth Bach and Scientific Chair Diana Wall contributed to the IPBES Global Assessment chapter on "Nature." Bach provided expert review for the UN Food and Agriculture Organization report "The State of the World's Biodiversity for Food and Agriculture."

### Engagement

The GSBI's Global Soil Biodiversity Atlas website features downloadable chapters, was developed and launched by SoGES in October 2017, and had garnered 8,500 views as of 2 April 2018.

The GSBI blog, Beneath Our Feet, had 24 posts during 2017-18 from experts in the US, Chile, UK, Australia, Italy, Canada, Brazil, India, Germany. The average post reaches 1,200-1,500 people, high-performing posts reach >8,000.

Elizabeth Bach and Diana Wall organized a symposium for the 2017 annual meeting of the Ecological Society of America titled "From microbes to moles: Integrating soil biodiversity for ecosystem resilience," which included a presentation from them "Essential partners: Soil biodiversity and functioning in grasslands."

Elizabeth Bach and Diana Wall each gave two invited presentations during the year, and Elizabeth presented a Soil Biodiversity webinar to the USA National Biodiversity Teach-In, reaching >600 middle and high-school students.

2nd Global Soil Biodiversity Conference in Nanjing, China photos (left to right): poster session, session crowd, and Wim van der Putten keynote talk







## Environmental Justice Working Group | [environmentaljustice.colostate.edu](http://environmentaljustice.colostate.edu)

Environmental justice is the view that all people deserve a healthy and safe environment in which to live, work, and play – regardless of their race, ethnicity, class status, age, gender, citizenship, and other social variables.

### Leadership

**Neil Grigg**, Department of Civil and Environmental Engineering  
**Melinda Laituri**, Department of Ecosystem Science and Sustainability  
**Stephanie Malin**, Department of Sociology  
**Dimitris Stevis**, Department of Political Science  
**Kathryn Powlen**, Human Dimensions of Natural Resources  
**Stacia Ryder**, Department of Sociology

 @EJCSU  Environmental Justice CSU

The Environmental Justice Working Group continued to focus on building collaborative research networks during the 2017-18 academic year, holding seven events with a total of 331 attendees. Highlights included partnering with the CSU Water Center to host a symposium on “Stories of Water Equity & Environmental Justice” in fall 2017 and hosting a Just Transitions Workshop for researchers and professionals across Colorado in spring of 2018. The “Water Equity” event attracted 179 attendees and featured presentations from student researchers, community activists, EPA staffers, and David Archambault II, former Standing Rock Chairman that will be featured in an upcoming special issue for the CSU Water Center journal Colorado Water.

In addition to establishing strong networks for future research collaboration, the Environmental Justice Working Group produced seven roundtable briefs (soon to be available online) and one special issue in *Environmental Sociology*, a peer-reviewed scholarly journal, during 2017-18. Members also gave six invited presentations during the year.

## Conservation Development Working Group | [cd.colostate.edu](http://cd.colostate.edu)

CSU researchers are working with public and private sector stakeholders to generate conservation science and develop policies that help sustain biodiversity and human communities along the urban to rural gradient.

### Leadership

**Liba Pejchar**, Department of Fish, Wildlife, and Conservation Biology  
**Sarah Reed**, Wildlife Conservation Society;  
Department of Fish, Wildlife, and Conservation Biology

The Conservation Development Working Group continued its close partnership with the City of Fort Collins Nature in the City initiative, working on a citizen science program designed to engage citizens in urban ecology and collect data on biodiversity in urban open spaces across the City. These data are being used by the City to make development and conservation decisions that retain important habitat and movement corridors for human-sensitive birds and butterflies as

the community grows. During 2017-18, the working group conducted a technician survey of 166 open space sites, stratified by size, land use and landscape context, following on from a similar survey performed in 2014, and coordinated a set of citizen science surveys at a subset of these sites. Miguel “Mikko” Jimenez, a graduate student associated with the working group, led these efforts described above, and is also assessing the ecological outcomes of the City’s Certified Natural Areas program.

- During 2017-18, the working group held four events with a total of about 200 participants, published two papers, and obtained two grants.

Moving forward, important priorities for the working group are to seek support to: 1) ensure citizen science volunteers fully reflect the diversity of our community; 2) identify ways to expand citizen engagement in conservation actions; and 3) share the Nature in the City program’s success with other communities facing similar challenges.



Photo by Cooper Farr



# EDUCATION & TRAINING

The School is actively involved in educating and equipping students with knowledge and tools to tackle sustainability challenges.

## Interdisciplinary Curriculum

Curriculum for the School's minors focuses 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.

fy 18

4

minors

342

total students  
enrolled

93

graduates  
overall

## Curriculum Committee

The SoGES curriculum committee provides oversight and advice for all SoGES educational activities, including development of courses and degree programs. The committee includes representation from all CSU colleges and the CSU library.

**Kathleen Galvin (Chair)**, Department of Anthropology; The Africa Center; and SoGES

**Jocelyn Boice**, CSU Libraries

**Cynthia Brown**, Department of Bioagricultural Sciences and Pest Management

**Rich Conant**, Department of Ecosystem Science and Sustainability  
and Natural Resource Ecology Laboratory

**Dale Lockwood**, Department of Biology and SoGES

**Suellen Melzer**, Department of Soil and Crop Sciences and SoGES

**Ryan Morrison**, Department of Civil and Environmental Engineering

**Johnny Plastini**, Department of Art and Art History

**Howard Ramsdell**, Department of Environmental and Radiological Health

**Tony Rappe**, Department of Chemistry

## Global Environmental Sustainability Minor

Provides a deep understanding of the complexity surrounding the problems we face and the solutions that we need to implement to address climate change, biodiversity, pollution, public health, oceans, food security and development on a global scale. As of this fiscal year, the GES minor is now available as an online option for students.

301

students  
enrolled

79

graduates  
FY18

to date **383** students have  
graduated with  
a GES minor

**“I want to make the world a better place.”**  
- most common answer when students are asked why they are completing the GES minor



*Spring 2018 minor graduation ceremony on the North lawn of Johnson Hall*

## Sustainable Water Interdisciplinary Minor

Collaborative with the CSU Water Center

**29** students enrolled

**9** graduates FY18

## Sustainable Energy Minor

Collaborative with the Energy Institute

**5** students enrolled

**2** graduates FY18

## Sustainability and its Role in Peace and Reconciliation Minor

**7** students enrolled

**3** graduates FY18

## CGW Scholarships - \$20K

The \$2,500 Charles Gladstone Wright, Jr. Scholarship is awarded annually to four Junior or Senior level students enrolled in the GES Minor and who have completed the GES 101 course with a GPA of 3.0 or better. The recipients were:

**Kami Bakken**, Human Dimensions of Natural Resources

**Elizabeth Anderson**, Computer Information Systems

**Blake Warner**, Department of Construction Management

**Alannah Liebert**, Department of Biology

## Arrow Electronics Grant - \$50K

SoGES and the CSU School of Advanced Materials Design received a grant from Arrow Electronics to develop and offer a course on Sustainable Solutions to Electronic Waste (GES 481A1).

## 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 as well as the global stability needs of other Department of Defense, USAID, Peace Corps, and development professionals.

**28** students enrolled

**5** certificates awarded FY18





# EDUCATION & TRAINING



*Dale Lockwood instructing the GES 101 course*

**12**

**GES courses  
offered FY18**

**585**

**students  
completed  
GES courses  
FY18**

## GES Courses

**GES 101\***  
Foundations of  
Global Environmental  
Sustainability

**GES 141**  
Introductions to  
Sustainable Energy

**GES 280\*\***  
Green Renters

**GES 441**  
Analysis to  
Sustainable Energy  
Solutions

**GES 481A1\*\***  
Sustainable Solutions  
to Electronic Waste

**GES 481A2\*\***  
Science and  
Economics of  
Climate Change

**GES 450**  
Sustainability  
and Health

**GES 460**  
The Law and  
Sustainability

**GES 470\***  
Applications in  
Global Environment  
Sustainability

**GES 520\***  
Issues in Global  
Environment  
Sustainability

**GES 130**  
Introduction to  
Sustainability  
Engagement

**GES 330**  
Sustainability  
in Practice

\* Face-to-face and online options

\*\* Experimental courses

— Courses are part of the Ecoleaders Program through Housing & Dining —

to date **3,223** students completed  
GES courses



# Sustainability Leadership Fellows

The year-long Fellowship provides early career scientists with training to effectively communicate science to the media and public, professional development skills and techniques, and strategies to build meaningful careers that incorporate engagement and interdisciplinarity. Through this program, the School 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.

Each cohort of Fellows begins the year with an orientation, followed by an intensive two-day science communication training workshop run by COMPASS, science communication specialists. Fellows then participate in six formal training sessions led by local and University experts on a range of topics including time management and workload optimization, interacting with policy-makers, data visualization, talking science with skeptical audiences, and storytelling. Fellows also take part in additional skill-building and networking opportunities throughout the year, including practice pitching their ideas to the University provost and writing and peer-review for the SoGES blog.



2017-18 Sustainability Leadership Fellow cohort

**7<sup>th</sup>**  
cohort

**20**  
fellows

**15**  
depts

**5**  
colleges

## College of Agricultural Sciences

**Libby Christensen**, Postdoctoral Fellow, Department of Agricultural and Resource Economics

**Stephen Cohen**, Ph.D. Candidate, Departments of Bioagricultural Sciences and Pest Management and Cell and Molecular Biology

**Dhaval Vyas**, Ph.D. Candidate, Department of Bioagricultural Sciences and Pest Management

**Erika Foster**, Ph.D. Candidate, Department of Soil and Crop Sciences and Graduate Degree Program in Ecology

## Walter Scott, Jr. College of Engineering

**Alexandra Naegele**, Ph.D. Student, Department of Atmospheric Science

**Rod Lammers**, Ph.D. Candidate, Department of Civil and Environmental Engineering

**Faizal Rohmat**, Ph.D. Candidate, Department of Civil and Environmental Engineering

**Jessica Tryner**, Postdoctoral Fellow, Department of Mechanical Engineering

## College of Veterinary Medicine and Biomedical Sciences

**Laura Rosen**, Ph.D. Candidate, Department of Clinical Sciences and Graduate Degree Program in Ecology

## College of Natural Sciences

**Robert Griffin-Nolan**, Ph.D. Student, Department of Biology and Graduate Degree Program in Ecology

**Carolina Gutierrez**, Ph.D. Student, Department of Biology

**Ava Hoffman**, Ph.D. Candidate, Department of Biology

**Kerry Rippy**, Ph.D. Candidate, Department of Chemistry

## Warner College of Natural Resources

**Tony Vorster**, Ph.D. Student, Department of Ecosystem Science and Sustainability and Graduate Degree Program in Ecology

**Rachel Buxton**, Postdoctoral Fellow, Department of Fish, Wildlife, and Conservation Biology

**Rekha Warriar**, Ph.D. Student, Department of Fish, Wildlife, and Conservation Biology

**Kate Wilkins**, Ph.D. Candidate, Department of Fish, Wildlife, and Conservation Biology

**Andrea Borkenhagen**, Ph.D. Candidate, Department of Forest and Rangeland Stewardship and Graduate Degree Program in Ecology

**Jacob Salcone**, Ph.D. Student, Department of Human Dimensions of Natural Resources

**Daniel Scott**, Ph.D. Student, Department of Geosciences

to date **140** sustainability leadership fellows from 31 departments across 8 colleges



# CENTERS & PROGRAMS

The School houses four CSU centers and one international organization.

## Africa Center | [africacenter.colostate.edu](http://africacenter.colostate.edu)

The CSU Africa Center is focused on enhancing the sustainability of African ecosystems and societies. The Center aims to enhance biodiversity, advance human and animal health, empower communities, and promote environmental, economic, and social sustainability.

**Director** Kathleen Galvin, Department of Anthropology

The Center's main priorities for the 2017-18 year were building national and international relationships and partnerships and organizing a set of lectures and panel discussions that addressed "Innovations Out of Africa," including panels on technology, cities, and biodiversity/conservation. During the summer of 2017, the center began working with the Denver-based Posner Center, whose mission is "building a community of innovators who grow lasting solutions to global poverty through collaborative international development." This relationship continued to develop throughout the 2017-18 academic year, which helped the Center form new partnerships with many non-profit and NGO groups, including the Africa Centre of Boulder and Uhambo of Fort Collins. Other highlights from the year included:

- Co-organization of an Africa-focused session in the annual International Colloquium sponsored by the CSU Office of International Programs. The panel discussion, "Integrated Research and Engagement in Africa: Looking to the Past and Designing Innovations for the Future," brought together researchers from Emory University, University of North Carolina at Chapel Hill, Utah State University, USAID, and CSU.
- Research presentations from a number of Africa Center faculty members at the Fort Collins Global Village Museum's four-month long exhibit focused on East Africa.
- The Center's annual Africa & Ale event, held in collaboration with the CSU Art and Art History Department, the CSU University Center for the Arts, and a local marimba group, featured special African-style beers that were produced and donated by four local northern Colorado breweries: Horse and Dragon, High Hops, Zwei, and Maxline.
- Two cross-campus luncheons for students interested in or working in Africa (also in cooperation with the Office of International Programs), support of one graduate student employee, and monthly coffee socials that included people from Denver, Boulder, and the greater Front Range community.

### Online Engagement

- ▶ **545** e-mail subscribers, a 5 percent increase
- ▶ **324** Twitter followers, a 11 percent increase
- ▶ **214** Facebook followers, a 16 percent increase
- ▶ **217** Instagram followers
- ▶ **4,893** website visits, a 21 percent increase

 @CSUAfricaCenter  CSUAfricaCenter

*The grey crowned crane, preening itself in Lewa Conservancy in northern Kenya, is the national bird of Uganda (photo by Tomas Pickering)*



Global Biodiversity Center Director, Chris Funk, is looking for tailed frogs (*Ascaphus truei*) in Blue River, Oregon (photo by Amanda Cicchino)

## Global Biodiversity Center | [biodiversity.colostate.edu](http://biodiversity.colostate.edu)

A network of faculty working on biodiversity research at the University encouraging knowledge transfer and cross-campus collaboration.

**Director** Christopher Funk, Department of Biology

The Global Biodiversity Center (GBC) was very active during 2017-18. The major highlight of the year was organization and hosting of a Global Biodiversity Summit, which was held here at CSU on October 11-12, 2017. The Summit, which had total attendance of about 400 people, was the first large-scale event held by the GBC, helping to spread awareness about its mission, plans, and activities to the broader conservation community. M. Sanjayan from Conservation International and Wendy Palen from Simon Fraser University delivered keynote presentations, and two panels discussed how to better preserve biodiversity from different perspectives and how to transform awareness into action.

The other major highlight of the year was initiation of the Program for Early-stage Grants Advancing Sustainability Science (PEGASuS), which is a collaborative effort between the GBC and the Colorado Hub

of Future Earth, supported by an award received from the Gordon and Betty Moore Foundation in 2016. The program is providing funding to five teams, selected through a global competition, who are working on research projects that address biodiversity and natural assets (see Future Earth section on page 17 for more information). The GBC also created a promotional video, premiered at the Summit, to raise awareness of biodiversity issues and the Center, held its annual Biodiversity Ignite event, and added Craig Starger and Jacey Cerda to its executive committee.

### Online Engagement

- ▶ **259** Twitter followers, a 62 percent increase
- ▶ **245** Facebook followers, a 23 percent increase
- ▶ **5,301** website visits, a 91 percent increase

 @CSUBiodiversity  GlobalBiodiversityCenter



## Salazar Center for North American Conservation

SoGES is developing the Salazar Center in response to a charge from Ken Salazar, former U.S. Secretary of the Interior and U.S. Senator from Colorado. The new Center, which was founded through generous donations from the Bohemian Foundation and Mr. Salazar, will play a leading role in promoting a large-scale and systemic view of North American conservation that recognizes connections between conservation, environmental quality, economic strength, and our quality of life.

Building effective and lasting links between science, policy development, and management will be one of the Center's most important tasks. It is also expected to address the relationship and coordination of public and private sector conservation decisions, the creation and maintenance of international parks and reserves, and the management of water resources and protected species across international borders.

During 2017-18, a small SoGES team led by Associate Director Peter Backlund worked with stakeholders to raise funds, develop a preliminary plan for Center operations, and conduct an international search for the inaugural Center director. The year's major highlight was a generous donation of approximately \$380,000 from CSU Alumnus Patrick Philips to support a "practitioner in residence" program at the Center.



# CENTERS & PROGRAMS

## 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) involves students in volunteer projects, hosts events to raise awareness about sustainability, consolidates and distributes sustainability information and news, and builds relationships across campus to promote environmental initiatives.



### Officers

- Emily Taylor, outgoing Director (graduated May 2018)
- Olivia Bruce, incoming Director
- Madison Wood, outgoing Director of Engagement (graduated December 2017)
- Sara Van Hatten, incoming Director of Engagement
- Nevan Mandel, Director of Outreach

### SSC events and attendance numbers

16	Sept. 7	Campus Bike Tour
32	Oct. 7	Chasing Coral Movie Screening
8	Nov. 6	Alumni Roundtable with Jon Hoganson
10	Jan. 19	Renewable DU Campus Visit
57	Feb. 12	Guest lecture co-sponsor
20	Feb. 28	Roundtable with former EPA Administrator Gina McCarthy
131	Mar. 5-6	Zero Waste Symposium
60	Mar. 22	River Blue Movie Screening
5	Apr. 6	Alumni Roundtable with Andrew Shakalis
27	Apr. 25	Sustainability Trivia Night

### Online Engagement

- ▶ **1397** e-mail subscribers, a 3 percent increase
- ▶ **809** Facebook followers, a 2 percent increase
- ▶ **269** Instagram followers, a 90 percent increase



### Engagement Programs

#### SSC Club

The SSC Club is available for students from all colleges and majors to promote sustainability efforts in personal lives as well as on the institutional level. Club activities within the SSC focused on making an impact on campus and in the community of Fort Collins. The SSC had four volunteer activities involving a total of approximately 50 volunteers.

#### Leading Environmental Advancement Fellowship (LEAF)

LEAF built off of the Leadership in Sustainable Professions program in fiscal year 2017-18 with the continued mission of exposing passionate students to sustainability leadership roles. This year, a more in-depth plan was developed with three goals in mind: expose students to a greater variety of industries, equip students with knowledge and strategies based on a broad array of disciplines, and identify mechanisms to track success and progress.

#### Nitrogen Footprint

The Nitrogen Footprint Project is a collaboration between 20 universities around the world started by James Galloway at the University of Virginia. CSU was a part of the first cohort of seven universities in 2014, and the Nitrogen Footprint has remained under the SSC as a student-led research effort. Jill Baron continues to advise students on the project, and Alannah Leibert, a CSU undergraduate in Ecosystem Science and Sustainability, oversaw the project in the SSC in fiscal year 2017-18. The focus this year was on increasing awareness among the campus community and establishing a profile using the Sustainability Indicator Management and Analysis Platform, which allows carbon and nitrogen to be tracked in one database.



Olivia Bruce, Sara Van Hatten, and Nevan Mandel sit on top of a 1000 pound denim display at the film screening of River Blue, March 22, 2018



## Future Earth | [futureearth.org](http://futureearth.org)

Future Earth is a 10-year international initiative to coordinate new, interdisciplinary actionable science efforts and solutions to sustainability challenges and global environmental change. Future Earth has five global hubs based in Colorado, Montreal, Paris, Stockholm, and Tokyo. The Colorado Hub resides within the School of Global Environmental Sustainability at CSU and the Sustainability, Energy, and Environment Complex at CU-Boulder.

### Colorado Hub – Secretariat Staff at CSU

**Joshua Tewksbury**, Global Hub Director (CU and SoGES-CSU)

**Craig Starger**, Research Enabling Lead (SoGES - CSU)

**Laurel Milliken**, Information Technology Officer (SoGES-CSU)

### Partnerships and Collaborations

Future Earth recently established a formal collaboration with key partners to co-host the “Earth Commission” - the first scientific attempt of carrying out a global assessment taking a whole Earth system approach. In addition, working with partners in the international Belmont Forum, Future Earth has scoped and launched a major international collaborative research call linking climate, global change, and human health with agencies from the U.S. Global Change Research Program and other Belmont participants, and supported development of a second international transdisciplinary research call on ocean sustainability.

### Knowledge Action Networks

Future Earth is developing Knowledge Action Networks in Health, Oceans, and the Water-Energy-Food Nexus, which will provide opportunities for co-creation of global research priorities for key integrated global change challenges, and help build communities in which research, policy and practice can exchange priorities and build research products. Each of these networks has developed a full research and engagement plan.

### Engagement

Future Earth organized The Seedbeds of Transformation Conference - a major convening held in May 2018 - which brought together sustainability science and innovation leaders for a three day event in Port Elizabeth, South Africa, to set a research, data, and innovation agenda to support African implementation of the United Nations for Sustainable Development Goals.

### Support for Sustainability Research

The Program for Early-stage Grants Advancing Sustainability Science (PEGASuS), run entirely from the US Hub of Future Earth, seeks to increase knowledge, promote innovation, and establish evidence-based solutions to the world’s most difficult sustainability challenges by advancing sustainability science as a rigorous research field. PEGASuS brings together researchers from across borders and the natural and social sciences to take creative approaches to exploring the relationships between people and the planet. The first round of PEGASuS grants, focusing on Biodiversity and Natural Assets were awarded in 2017:

- ▶ “Drug trafficking and Central American protected areas: Focusing on participatory governance to conserve ecosystem services and biodiversity,” Bernardo Aguilar González PI, Fundación Neotrópica
- ▶ “Farmer-led agroecological research in Malawi (FARM) for biodiversity,” Rachel Bezner Kerr PI, Cornell University
- ▶ “Toward biodiversity-related opportunities for sustainable development: A global social-ecological mountain comparison,” Markus Fischer PI, GMBA and University of Bern
- ▶ “Nurturing a shift towards equitable valuation of nature in the Anthropocene (EQUIVAL),” Unai Pascual PI, ecoSERVICES and Basque Centre for Climate Change
- ▶ “Cross-pollinating knowledge systems: Exploring indigenous local knowledge about native bee diversity and ecology,” Wendy R. Townsend PI, University of Florida

In June of 2018, the US Hub launched PEGASuS 2: Ocean Sustainability, adding a new partner, the National Center for Ecological Synthesis and Analysis. This new partnership is expected to support up to four working groups and one postdoctoral researcher advancing ocean sustainability science. PEGASuS is being implemented in collaboration with the CSU Global Biodiversity Center and funded in part by the Gordon and Betty Moore Foundation’s Science Program and the NOMIS Foundation.





# ENGAGEMENT

The School acts as a conduit for sustainability science and works to communicate and connect that science to diverse audiences.

## Events

### Managing the Planet Panel Series

Managing the Planet panels address diverse topics related to current sustainability issues and feature an interdisciplinary panel of Colorado State University experts conducting research related to the topic. Panels are organized to highlight current research and designed to engage the audience and dedicate the majority of time to questions and discussions.

Attendance	Event
75	Sept. 7 <i>Greening Beer: How local brewers are prioritizing sustainability</i>
84	Oct. 5 <i>Melting Down Glaciers from Mountains to Poles: What does it mean for us?</i>
95	Nov. 2 <i>Sustainability: How do we measure it?</i>
125	Feb. 7 <i>Wolf: Friend or foe?</i>
100	Mar. 7 <i>Women: Key to sustainability</i>
150	Apr. 4 <i>Envisioning Our Future City: Will we still love it?</i>

### Antarctic Lecture Series

The Antarctic Lecture Series is held once a month through the academic year discussing life and work 'on the ice' with invited Antarctic researchers. These lectures are located at the Poudre River Library District – Old Town Library.

Attendance	Event
30	Sept. 28 <i>Pacifica Sommers - A Glacier's Microbiome: Using microbes and cryoconite holes to learn about ecosystems</i>
40	Oct. 18 <i>Shane Kanatous - How Well Can the Leopard Seal Adapt to a Changing Climate?</i>
40	Nov. 28 <i>Ruth Heindel - Phosphorus Links Rocks and Life in the McMurdo Dry Valleys, Antarctica</i>
45	Mar. 27 <i>Chris Jaros - Desert Streams in Antarctica</i>
50	Apr. 17 <i>Poppie Gullet - Picturing the Past in the McMurdo Dry Valleys</i>

### SoGES Science Seminar Series

These events showcase research conducted by the SoGES research scientists.

Attendance	Event
20	Apr. 5 <i>Craig Starger - Reflections on Ocean Sustainability from Research, Policy, and Management</i>
30	Apr. 12 <i>Elizabeth Bach - Restoring Soil Habitats to Rebuild Biodiversity and Ecosystem Services</i>
20	Apr. 20 <i>Patrick Keys - The Precipitationshed as a Tool for Linking Hydrology and Sustainability Science</i>

fy 18

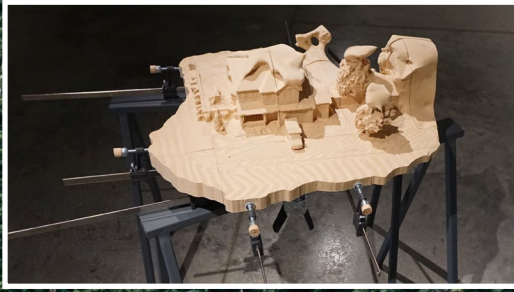
60  
total  
events

21  
SoGES  
specific  
events

39  
collaborative  
events

4,050  
total  
attendees

## Special SoGES Events



*David Brooks, Case Study: Weld County, CO (detail), 2017, 3D scans and FDM 3D prints from corn-based plastic mixed with wood fibers*

### In Our Backyards: Fracking in the Suburbs

November 9, 2017

SoGES worked with Erica Osborne (CSU Department of Art and Art History and SoGES affiliate faculty member) and CSU's Gregory Allicar Museum of Art to organize a panel discussion on hydraulic fracturing and urban development that was held at the museum in conjunction with an exhibition titled "Case Study: Weld County, CO" by artist David Brooks.



*Bas Bleu Theatre Founding Artistic Director, Wendy Ishii, and Playwright, Laura Pritchett, with soil ecology scientists on a panel following the play*

### DIRT, A Terra Nova Expedition by Laura Pritchett

April 26, 2018

SoGES sponsored an evening event at the Bas Bleu Theatre in Fort Collins. During this evening, audience members were treated to a reception and the play (inspired by soil ecology) followed by a panel with science experts.

## Communications & Support

### Website | [sustainability.colostate.edu](http://sustainability.colostate.edu)

- ▶ **52,195** visits
- ▶ visits from **188** countries
- ▶ international traffic constituted **22%** of total visits

### Blog

- ▶ **20** guest posts from CSU early career postdoctoral fellows and Ph.D. students
- ▶ **6,325** visits, a 7 percent increase
- ▶ international traffic constituted **46%** of total visits

### Vimeo

- ▶ **3,481** total video plays, 155% increase from previous year

### YouTube (new this year)

- ▶ **471** total video plays

### Social Media and Correspondence

- ▶ **4,329** subscribers to the School email list and newsletter, a 33 percent increase
- ▶ **1,530** Facebook Likes, a 9 percent increase
- ▶ **2,270** Twitter followers, a 8 percent increase

### Media Mentions

- ▶ **183** mentions in the media
- ▶ **69%** of the stories ran in the U.S.
- ▶ **31%** of the stories ran internationally

### Conference Rooms

- ▶ **253** interdisciplinary sustainability-related meetings and events
- ▶ **429** usage hours
- ▶ **111** staff-initiated meetings and events

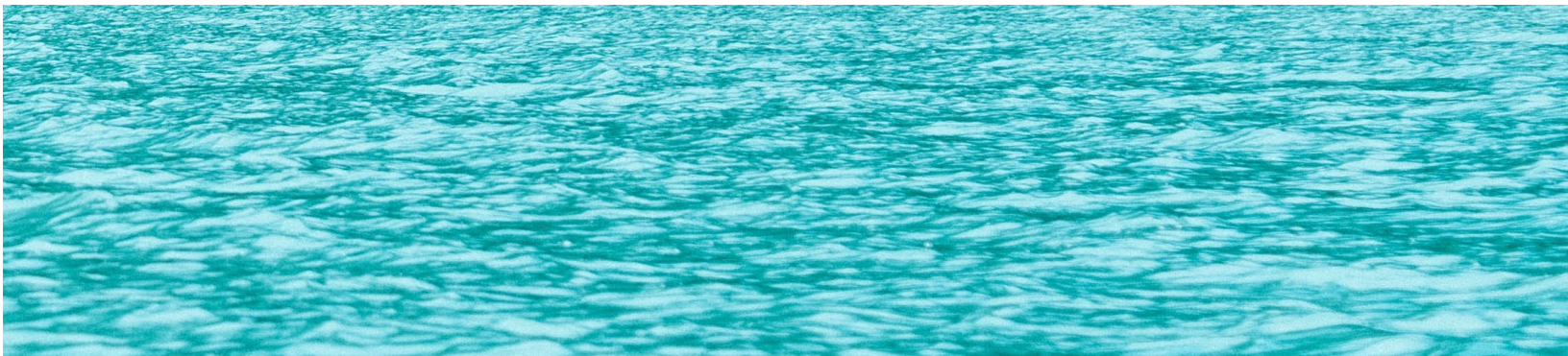




Photo by Pat Keys

## External Advisory Board

**Oswaldo Sala (chair)**, Julie A. Wrigley and Foundation Professor, School of Life Sciences, Arizona State University

**Rosina Bierbaum**, Professor, School for Environment and Sustainability, University of Michigan

**Thomas Dietz**, Assistant Vice President for Environmental Research, Michigan State University

**Thomas Lovejoy**, University Professor, Department of Environmental Science and Policy, George Mason University

**James B. Martin**, Senior Counsel, Beatty & Wozniak, P.C.

**Former Colorado Governor Bill Ritter, Jr.**, Director, Center for the New Energy Economy

**Joyce Berry**, Emeritus Dean, Warner College of Natural Resources

**William "Bill" Brennan**, Water and Sustainability Investor

**Maggie L. Fox**, President and CEO, The Climate Reality Project

**Rob Jackson**, Michelle and Kevin Douglas Provostial Professor, School of Earth Sciences, Stanford University

**W. Berry Lyons**, Professor and Director of the School of Earth Sciences, Ohio State University

**Jonathan Patz**, Director, Global Health Institute, University of Wisconsin-Madison

**Scott J. Sternberg**, Former President, Vaisala USA, Inc.

## Staff

**Olivia Bruce**, Director, Student Sustainability Center

**Jarvis Choury**, Fiscal and Operations Manager

**Ryan Deming**, Web Content Specialist

**Pat Keys, Ph.D.**, Research Scientist

**Dale Lockwood, Ph.D.**, Academic Coordinator; Assistant Professor, Department of Biology and SoGES

**Suellen Melzer, Ph.D.**, Assistant Professor, Department of Soil and Crop Sciences and SoGES

**Laurel Milliken**, Information Technology Officer, Future Earth Colorado Global Hub

**Matt Norton**, Fiscal Assistant Manager

**Kristin Pintauro**, Communications Coordinator

**Moira Sharkey**, Development Officer

**Laura Shaver**, Event and Administrative Coordinator

**Craig Starger, Ph.D.**, Research Enabling Lead, Future Earth Colorado Global Hub and SoGES Research Scientist

**Aleta Weller**, Senior Research and Engagement Officer

**Carl Wepking, Ph.D.**, Global Soil Biodiversity Initiative Executive Director

## Senior Scholars

**Former Governor Bill Ritter, Jr.**, Director, Center for the New Energy Economy, Colorado State University

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

**Josh Tewksbury**, Director, Colorado Global Hub, Future Earth

# Affiliate Faculty

Ruth Alexander	History	Alan Knapp	Biology
Patricia Aloise-Young	Psychology	Mary-Ann Kokoska	Art and Art History
Rick Aster	Geosciences	Boris Kondratieff	Bioagricultural Sciences and Pest Management
Peter Backlund	SoGES	Sonia Kreidenweis	Atmospheric Science
Ken Barbarick	Soil and Crop Sciences	Stephan Kroll	Agricultural and Resource Economics
Edward Barbier	Economics	Melinda Laituri	Ecosystem Science and Sustainability
Jo Burgess Barbier	Economics	Jan Leach	Bioagricultural Sciences and Pest Management
Jennifer Barfield	Veterinary and Biomedical Sciences	Katherine Leigh	Design and Merchandising
Elizabeth Barnes	Atmospheric Science	Dale Lockwood	Biology & SoGES
Jill Baron	Ecosystem Science and Sustainability	Sheryl Magzamen	Environmental and Radiological Health Sciences
Dan Beachy-Quick	English	Stephanie Malin	Sociology
Del Benson	Fish, Wildlife, and Conservation Biology	Anthony Marchese	Mechanical Engineering
Alexandra Bernasek	Economics	Katie McShane	Philosophy
Autumn Bernhardt	University Honors Program	Sue Ellen Melzer-Drinnen	Soil and Crop Sciences
Michele Betsill	Political Science	Stephen Mumme	Political Science
Aditi Bhaskar	Civil and Environmental Engineering	Donald Mykles	University Honors Program
Jens Blotvogel	Civil and Environmental Engineering	Troy Ocheltree	Forest and Rangeland Stewardship
Thomas Borch	Soil and Crop Sciences & Chemistry	Paul Ode	Bioagricultural Sciences and Pest Management
Cynthia Brown	Bioagricultural Sciences and Pest Management	Dennis Ojima	Ecosystem Science and Sustainability
Daniel Bush	Biology	Svetlana Olbina	Construction Management
Phil Cafaro	Philosophy	Erika Osborne	Art and Art History
Martin Carcasson	Communication Studies	Mehmet Ozbek	Construction Management
Jonathan Carlyon	Languages, Literatures, and Cultures	Merlyn Paulson	Horticulture and Landscape Architecture
Michael Carolan	Sociology	Keith Paustian	Soil and Crop Sciences
Joseph Champ	Journalism and Technical Communication	Lori Peek	Sociology
Suren Chen	Civil and Environmental Engineering	Jennifer Peel	Environmental and Radiological Health Sciences
Tony Cheng	Forest and Rangeland Stewardship	Graham Peers	Biology
Jane Choi	Horticulture and Landscape Architecture	Liba Pejchar	Fish, Wildlife, and Conservation Biology
Stephanie Clemons	Design and Merchandising	LeRoy Poff	Biology
Doug Cloud	English	Jason Quinn	Mechanical Engineering
Rich Conant	Ecosystem Science and Sustainability	Jorge Ramirez	Civil and Environmental Engineering
Daniel Cooley	Statistics	Howard Ramsdell	Environmental and Radiological Health Sciences
M. Francesca Cotrufo	Soil and Crop Sciences	Dave Randall	Atmospheric Science
Kevin Crooks	Fish, Wildlife, and Conservation Biology	Tony Rappe	Chemistry
Sandra Davis	Political Science	Kristen Rasmussen	Atmospheric Science
Charles Davis	Political Science	Ravi Ravishankara	Chemistry
Tom Dean	Management	Laura Reynolds	Sociology
Scott Denning	Atmospheric Sciences	Ken Reardon	Chemical and Biological Engineering
Robert Duffy	Political Science	Sarah Reed	Fish, Wildlife, and Conservation Biology
Brian Dunbar	Institute for the Built Environment	Elizabeth Ryan	Environmental and Radiological Health Sciences
Colleen Duncan	Microbiology, Immunology, and Pathology	Kyle Saunders	Political Science
Maria Fernandez-Gimenez	Forest and Rangeland Stewardship	Meagan Schipanski	Soil and Crop Sciences
Emily Fischer	Atmospheric Sciences	Robert Schorr	Fish, Wildlife and Conservation Biology
Erica Fleischman	Director of CEMML	Courtney Schultz	Forest and Rangeland Stewardship
Steven Fonte	Soil and Crop Sciences	Andy Seidl	Agricultural and Resource Economics
Brian Foy	Microbiology, Immunology, and Pathology	Arathi Seshadri	Soil and Crop Sciences
Jason Frazier	Art and Art History	Sybil Sharvelle	Civil and Environmental Engineering
Chris Funk	Biology	Kenneth Shockley	Philosophy
Kathy Galvin	Anthropology	Melinda Smith	Biology
Cameron Ghalambor	Biology	Bruno Sobral	One Health & Microbiology, Immunology, & Pathology
Scott Glick	Construction Management	Dimitris Stevis	Political Science
Susan Golicic	Management	Peter Taylor	Sociology
Neil Grigg	Civil and Environmental Engineering	Dawn Thilmany McFadden	Agricultural and Resource Economics
Elizabeth Hobbs	Horticulture and Landscape Architecture	David Thompson	Atmospheric Sciences
Thomas Holtzer	Bioagricultural Sciences and Pest Management	Bill Timpson	School of Education
Amy Hoseth	Library	Craig Trumbo	Journalism and Technical Communication
Paul Hudnut	Management	Rodolfo Valdes-Vasquez	Construction Management
Ruth Hufbauer	Bioagricultural Sciences and Pest Management	Sue VandeWoude	Microbiology, Immunology, and Pathology
Michael Humphrey	Journalism & Media Communication	Subhas Venayagamoorthy	Civil and Environmental Engineering
Rebecca Jablonski	Agriculture & Resource Economics	Chandrasekar Venkatachalam	Electrical and Computer Engineering
Gene Kelly	Soil and Crop Sciences	Diana Wall	SoGES & Biology
Raj Khosla	Soil and Crop Sciences	Reagan Waskom	Colorado Water Institute
Julia Klein	Ecosystem Science and Sustainability	Ellen Wohl	Geosciences
		Jill Zarestky	School of Education

# Finance Report

	Budget	Actual Expenses	Credits
<b>FY 2017-18 BASE BUDGET</b>	<b>\$1,018,417.00</b>		
<b>Salaries</b>			
Director, Associate Director, Assistant Director		\$402,412.00	
Staff		\$441,992.51	
<b>SALARIES TOTAL</b>		<b>\$844,404.51</b>	
<b>Research</b>			
Global Challenges Research Teams and Working Groups		\$51,111.00	
Resident Fellows		\$33,600.00	
<b>TOTAL</b>		<b>\$84,711.00</b>	
<b>Sustainability Leadership Fellow Program</b>			
Science Communication Workshop, trainings, year operations and supplies		\$38,129.75	
<b>TOTAL</b>		<b>\$38,129.75</b>	
<b>Education</b>			
GES traditional and online courses (Professors, TAs, supplies, and trips)		\$138,236.32	
<b>TOTAL</b>		<b>\$138,236.32</b>	
<b>Student Sustainability Center</b>			
Salaries		\$6,483.54	
Operations and events		\$3,019.77	
<b>TOTAL</b>		<b>\$9,503.31</b>	
<b>PROGRAM ACTIVITIES TOTAL</b>		<b>\$270,580.38</b>	
<b>General Administration</b>			
Supplies		\$23,631.54	
Operating charges (events, phone, data, etc.)		\$89,534.60	
Travel		\$37,200.00	
<b>TOTAL</b>		<b>\$150,366.14</b>	
<b>EXPENSE TOTAL</b>		<b>\$1,265,351.03</b>	
1X monies			\$75,667.00
1X Tyler Prize gift match from Central			\$46,455.46
Sponsored Projects overhead return			\$43,579.71
Differential tuition			\$32,267.00
2-3-6 Distribution			\$11,880.00
Online Courses revenue			\$29,137.86
FY17 carryforward			\$60,099.00
<b>Balance</b>			<b>\$52,152.00</b>
Balance for future commitments in FY19 \$52,152			

## Grants & Donations

- \$380,000 from CSU Alumnus Patrick Philips to support the planned “Scholar in Residence” program at the new Salazar Center for North American Conservation.
- \$10,000 from the Charles G. Wright (CGW) Foundation to support scholarships for GES students.
- \$22,358 from the CSU Water Center for new research activity.

# Publications

## Research Scientist: Pat Keys

Keys, P.W. and Wang-Erlandsson, L. (2018) On the social dynamics of moisture recycling. *Earth System Dynamics* 9(2): 829-847. <https://doi.org/10.5194/esd-9-829-2018>

Keys, P.W. and Falkenmark, M. (2018) Green water and African sustainability. *Food Security*. <https://doi.org/10.1007/s12571-018-0790-7>

Keys, P.W., Wang-Erlandsson, L., and Gordon, L.J. (2018) Megacity precipitationsheds reveal tele-connected water security challenges. *PLoS ONE*. <https://doi.org/10.1371/journal.pone.0194311>

Linkov, I., Fox-Lent, C., Read, L., Allen, C. R., Arnott, J. C., Bellini, E., Coaffee, J., Florin, M., Hatfield, K., Hyde, I., Hynes, W., Jovanovic, A., Kaspersen, R., Katzenberger, J., Keys, P. W., Lambert, J. H., Moss, R., Murdoch, P. S., Palma Oliveira, J., Pulwarty, R. S., Sands, D., Thomas, E. A., Tye, M. R. and Woods, D. (2018), Tiered Approach to Resilience Assessment. *Risk Analysis*. doi:10.1111/risa.12991

Merrie, A., Keys, P.W., Metian, M., and Osterblom, H. (2017) Radical Ocean Futures – An imaginative narrative scenarios approach. *FUTURES* (95), 22-32. <https://doi.org/10.1016/j.futures.2017.09.005>

## Resident Fellow: Andy Seidl

Pascal, N., Brathwaite, A., Seidl, A., Brander, L., Clua, E. (forthcoming 2018). Evidence of economic benefits for public investment in MPAs. *Ecosystem Services*.

Verdone, M. and Seidl, A. (2017). Time, space, place, and the Bonn Challenge global forest restoration target. *Restoration Ecology* Vol. 25(6), pp. 903–911. doi:10.1111/rec.12512

Roberts, R.M., Ek, A., Smith, H., Jones, K., Seidl, A., and Skyelander, K. (2017). Conservation finance and sustainable tourism: The acceptability of conservation fees to support Tambopata National Reserve, Peru. *Journal of Sustainable Tourism*, 15(10), 1353-1366.

## Resident Fellow: Sophie Esch

Esch, S. (2017) In the Company of Animals: Otherness, Empathy, and Community in De fronteras by Claudia Hernández. *Revista de Estudios Hispánicos*, 51(3), 571-593.

## Resident Fellow: Tom Dean

Barbier, E. B., Burgess, J. C., & Dean, T.J. (2018) How to Pay for Saving Biodiversity: Can Private Sector Involvement in a Global Agreement Help to Conserve Global Biodiversity?. *Science*, 360(6388), 486-488.

## 2015-2016 Global Challenges Research Team: Hydraulic Fracturing

Burgos, W.D., Castillo-Mezo, L., Tasker, T.L., Geeza, T.J., Drohan, P.J., Liu, X., Landis, J.D., Blotevogel, J., McLaughlin, M., Borch, T., & Warner, N.R. (2017). Watershed-scale Impacts from Surface Water Disposal of Oil and Gas Wastewater in Western Pennsylvania. *Environmental Science & Technology*, 51, 8851-8860. DOI: 10.1021/acs.est.7b01696

## 2014-2015 Global Challenges Research Team: Climbers and Bat Conservation

Davis, S.K., Schorr, R., & Kuhn, B. (2017) Climbers for bat conservation: methods in forming a novel partnership. *Wildlife: Perceptions, Threats, and Conservation*. Hauppauge, NY: Nova Science Publishers

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SCHOOL OF GLOBAL  
ENVIRONMENTAL SUSTAINABILITY  
COLORADO STATE UNIVERSITY

## INVEST in a SUSTAINABLE FUTURE

*Empowering the sustainability leaders of today and tomorrow*

At CSU, eighty percent of incoming students identify sustainability as a top interest for study. The next generation is demanding an understanding of how economic, social, and environmental factors all interact together to create their future. SoGES, through its integration of research, education, and engagement, meets that need on the CSU campus.

As part of State Your Purpose – The Campaign for Colorado State University, SoGES seeks to accomplish the following by 2020:

- ▶ **Increase total enrollment to 1,000 students annually** by expanding course offerings and developing new degree programs in Global Environmental Sustainability
- ▶ **Enhance fellowship and scholarship programs** to provide more support for students, early-career researchers, professors, and practitioners
- ▶ **Expand research on critical interlinked sustainability challenges**, such as preserving biodiversity, improving food security, reducing poverty, and minimizing the human and environmental impacts of climate change and energy production
- ▶ **Develop new community partnerships, engagement, and outreach activities** to identify needs and bring CSU expertise to bear on local, regional, national, and global challenges

These are not humble goals. They will ensure that Colorado State University continues as a global leader in sustainability research, education, and outreach. Achieving them requires resources to bring faculty together across disciplines, to provide more courses and advising to more students, and to engage public and private partners in solving the greatest sustainability challenges of our time. That is why SoGES is seeking to raise \$50 million by 2020.

We invite you to be part of a sustainable future by supporting the School of Global Environmental Sustainability. To learn more about giving to SoGES, contact Andrew Kimsey in University Advancement at (571) 217-1657 or [andrew.kimsey@colostate.edu](mailto:andrew.kimsey@colostate.edu).

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