Advancing Global Sustainability through Research, Education, and Engagement

2014-2015 Annual Report

SCHOOL OF GLOBAL ENVIRONMENTAL SUSTAINABILITY

Colorado State University

SCHOOL OF GLOBAL ENVIRONMENTAL SUSTAINABILITY
Colorado State University
COLLABORATION. INNOVATION. CHANGE

ABOUT THE SCHOOL

The School of Global Environmental Sustainability (SoGES) is a Special Academic Unit attached to the Office of the Provost and Executive Vice President. SoGES connects all eight colleges at Colorado State University (CSU) by providing a structure for sustainability research, education, and engagement. The School supports faculty in development of new research and curricula, mentors early career scientists, teaches students, and enables deeper connections across disciplinary and institutional boundaries. SoGES fosters ongoing dialogue about sustainability issues with a multitude of stakeholders from the academic, public, and private sectors. The School builds on CSU's history of leadership in environmental science and education by integrating sustainability studies with the sciences, humanities, arts, and business.

SoGES advances understanding of global environmental sustainability by exploring, documenting, and teaching about the links between environmental, societal, and economic aspects of sustainability. These relationships must be addressed to effectively tackle the sustainability challenges of the 21st century, such as minimizing biodiversity loss, providing solutions to the impacts of climate change, and improving food security while meeting the needs of a human population that is projected to reach 9 billion people by mid-century. Complex and multi-faceted issues require creative management and problem solving informed by interdisciplinary understanding. These are the foci of SoGES' broad-based curriculum and its research, education, and engagement activities.

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Vision

A world that is environmentally healthy, socially equitable, and economically vibrant.

Mission

- Conduct innovative research that leads to new and deeper understanding of sustainability issues.
- Provide a challenging, integrative, and provocative education that gives our students knowledge and tools that enable them to contribute to environmental sustainability.
- Engage with the public, decision-makers, and other stakeholders to translate discoveries into useful information and practical solutions to pressing environmental problems.

Definition of Environmental Sustainability

Ensuring the long-term viability of human society and the natural world by recognizing the interdependence of the Earth's social, economic, and environmental systems and considering interacting systemic effects when making decisions.

Research Areas

To strategically address CSU's sustainability strengths, the School's research is organized into six subject areas: Climate Change and Energy; Food Security; Environmental Institutions and Governance; Sustainable Communities; Land and Water Resources; and Biodiversity, Conservation, and Management.

CSU's Johnson hall where the School is located

HIGHLIGHTS

Research applying scientific creativity to sustainability grand challenges

TO DATE:

26 interdisciplinary faculty research teams

17 faculty fellows

37 departments and 8 colleges represented

$10,828,263 funding obtained by PIs from external sponsors

35+ scholarly articles, books, and book chapters published

80 PhD student and postdoctoral sustainability leadership fellows

23 departments and 7 colleges represented

10 visiting international scholars hosted

8 countries represented

FY 2014-15:

- **6 Global Challenges Research Teams** ..... *pg. 8-10*
  - $64,000 awarded by SoGES
  - 18 faculty principal investigators from 11 departments and 5 colleges
  - 10 manuscripts published, more in development
  - $3,302,424 in grants from other sponsors
  - Outreach events held
  - Cross-campus networks and research partnerships established
  - New, innovative approaches to scientific questions produced
- **3 Visiting Fellows** ..... *pg. 11*
  - 1 from Spain, 2 from the U.S.
  - 2 manuscripts published, more in development
- **4 Resident Fellows** ..... *pg. 12-13*
  - $22,000 awarded by SoGES
  - 10 manuscripts published, more in development
  - 2 works of art created
  - $1,202,773 in grants from other sponsors
  - 6 scientific presentations
  - 4 events held
- **4th cohort of Sustainability Leadership Fellows** ..... *pg. 14-15*
  - 20 Fellows from 15 departments and 6 colleges
  - 10 training and professional development events
- **4 international initiatives and working groups**
  - Global Soil Biodiversity Initiative ..... *pg. 16*
  - The Africa Center ..... *pg. 17*
  - Biodiversity Working Group ..... *pg. 17*
  - Future Earth* ..... *pg. 18*

  ** externally funded*

Education interdisciplinary learning and scholarship

TO DATE:

163 CSU graduates hold a minor in Global Environmental Sustainability

6 sustainability courses developed

1,395 students completed GES 101

210 students completed GES 470

95 high school students from 27 states brought to CSU to learn about sustainability

57 courses across 7 colleges endorsed for sustainability curricula

FY 2014-15:

- 67 students graduated with GES minor ..... *pg. 20*
- 31% enrollment increase to 249 students in GES minor
- GES minor students come from 45 different majors and all 8 colleges
- 302 students completed GES 101 ..... *pg. 20*
- 67 students completed GES 470 ..... *pg. 21*
- 3 new sustainability courses developed ..... *pg. 21*
- 34 high school students attended the Pre-college Summer Sustainability Program ..... *pg. 22*

Engagement encouraging dialogue for informed solutions

TO DATE:

2,753 email list subscribers

1,177 Facebook likes

1,467 Twitter followers

Continually increasing reach through events and activities

FY 2014-15:

- 105 faculty members representing 34 departments and all 8 colleges ..... *pg. 6*
- 4 Dining with Sustainability dinners* ..... *pg. 24*

  ** externally funded*
- Student Sustainability Center increased its reach and programs ..... *pg. 25*
- 12% increase in website visitors ..... *pg. 26*
- 182,622,224 earned media reach ..... *pg. 26*
- 165 external sustainability-related meetings held in SoGES conference rooms ..... *pg. 26*
- 52 hosted and co-hosted events ..... *pg. 26-29*

In FY 2014-15, Colorado State University earned the first-ever platinum rating in STARS (Sustainability Tracking, Assessment and Rating System) from the Association for the Advancement of Sustainability in Higher Education, was ranked 12th in Princeton Review's Top 50 Green Colleges list and 5th of public research universities, was one of nine inaugural honorees for the Department of Education Postsecondary Sustainability Awards, and was named the most sustainable university in the nation by bestcolleges.com. School of Global Environmental Sustainability cross-campus programs and initiatives played a significant role in CSU's sustainability research, education, and engagement credentials.

Diana H. Wall, Director

Diana is a University Distinguished Professor, a Professor of Biology, and Senior Research Scientist in the Natural Resource Ecology Laboratory at Colorado State University. She is actively engaged in research on sustaining soils and has spent 26 seasons in the Antarctic McMurdo Dry Valleys examining how global changes impact soil biodiversity, ecosystem processes, and ecosystem services. Diana is the 2013 recipient of the Tyler Prize for Environmental Achievement, a member of the American Academy of Arts and Sciences, and was inducted into the 2014 Colorado Women's Hall of Fame. Diana is the chair of the Scientific Advisory Committee of the Global Soil Biodiversity Initiative, was Chair of the Council of Scientific Society Presidents, and Past President of the Ecological Society of America and the American Institute of Biological Sciences. She holds an Honorary Doctorate from Utrecht University and received a B.A. and Ph.D. from the University of Kentucky, Lexington.

Peter W. Backlund,

Associate Director

Peter Backlund joined SoGES as Associate Director in September 2014. He was previously Director of the Integrated Science Program and Director of External Relations at the National Center for Atmospheric Research, and before that held senior positions at the White House Office of Science and Technology Policy, and the National Aeronautics and Space Administration. Peter's interests include the relationship of human activities and environmental changes; the integration of social science and natural science; assessment of climate change vulnerability, risks and response strategies; use of scientific research in decision-making and public policy; and improving the communication of scientific information to non-technical audiences. He has helped lead scientific assessments of the effects of climate change on land resources, water resources, biodiversity, agriculture, and global food security. Peter is a fellow of the American Association for the Advancement of Science and received his BA from the University of New Mexico and his MA from the George Washington University.

Kathleen Galvin,

Associate Director of Education

Kathy Galvin is Professor of Anthropology, Senior Research Scientist at the Natural Resource Ecology Laboratory, Head of the Africa Center at CSU, and SoGES Associate Director for Education. She is also an Advising Faculty member in the Graduate Degree Program in Ecology at CSU. Trained as a biological anthropologist, she has conducted interdisciplinary human-ecological research in east and southern Africa and central and East Asia. She is interested in issues of pastoral land use, conservation, climate variability, resilience, and adaptation strategies of people in drylands, and household decision-making under environmental uncertainty. Kathy has served on multiple National Research Council and National Science Foundation panels. She was an Aldo Leopold Leadership Fellow, and received her BA and MA from CSU and her PhD from Binghamton University.

Eugene Kelly, Associate Director of Research and Development

Gene Kelly is a Professor of Pedology and Head of the Department of Soil and Crop Sciences in CSU's College of Agriculture, and has served as SoGES Associate Director for Research since 2009. Gene conducts research and lectures nationally and internationally on various aspects of soils as related to global change issues. His scientific specialization is in pedology and geochemistry with primary interests in the biological weathering of soil and studies of soil degradation and global biogeochemical cycles. His current research centers around the influence of climate change and land use on soil degradation and sustainability in water limited systems worldwide. He serves as an advisor to the United States Department of Agriculture with the National Cooperative Soil Survey and several major research programs. He is a Fellow of the Soil Science Society of America and received his B.S. and M.S. degrees from CSU and his Ph.D. from the University of California-Berkeley.
Gene is currently on leave from CSU, serving as interim Chief Executive Officer of the National Ecological Observatory Network (NEON.)

External Advisory Board

Osvaldo Sala (chair)

Julie A. Wrigley Professor
at Arizona State University

Joyce Berry

Former Dean of the Warner College of Natural Resources, Colorado State University

Thomas Dietz

Professor of Sociology and Environmental Science and Policy and Assistant Vice President for Environmental Research at Michigan State University

Maggie L. Fox

President and CEO of
The Climate Reality Project

Rob Jackson

Michelle and Kevin Douglas Provostial Professor, School of Earth Sciences at Stanford University and Senior Fellow at the Woods Institute for the Environment and Precort Institute for Energy

Kim Jordan

Co-founder and past CEO
of New Belgium Brewing Company

Thomas E. Lovejoy

Senior Fellow at the United Nations Foundation and University Professor in the Department of Environmental Science and Policy at George Mason University

W. Berry Lyons

Professor and Director of the School of Earth Sciences at Ohio State University

James B. Martin

Senior counsel Beatty & Wozniak, P.C.,
Denver, Colorado

Jonathan Patz

Professor and Director of the Global Health Institute at the University of Wisconsin

FACULTY

Ruth Alexander	History
Peter Backlund	School of Global Environmental Sustainability
Ken Barbarick	Soil and Crop Sciences
Jennifer Barfield	Veterinary and Biomedical Sciences
Jill Baron	Ecosystem Science and Sustainability
Dan Beachy-Quick	English
Del Benson	Fish, Wildlife, and Conservation Biology
Michele Betsill	Political Science
Jens Blotevogel	Civil and Environmental Engineering
Thomas Borch	Soil and Crop Sciences
Cynthia Brown	Bioagricultural Sciences and Pest Management
Daniel Bush	Biology
Phil Cafaro	Philosophy
Sue Ellen Campbell	English
Martin Carcasson	Communication Studies
Michael Carolan	Sociology
Joseph Champ	Journalism and Technical Communication
Suren Chen	Civil and Environmental Engineering
Tony Cheng	Forest and Rangeland Stewardship
Jane Choi	Horticulture and Landscape Architecture
Stephanie Clemons	Design and Merchandising
Rich Conant	Ecosystem Science and Sustainability
Daniel Cooley	Statistics
M. Francesca Cotrufo	Soil and Crop Sciences
Kevin Crooks	Fish, Wildlife, and Conservation Biology
Charles Davis	Political Science
Sandra Davis	Political Science
Tom Dean	Management
Scott Denning	Atmospheric Sciences
Robert Duffy	Political Science
Brian Dunbar	Institute for the Built Environment
Maria Fernandez-Gimenez	Forest, Rangeland, and Watershed Stewardship
Mark Fiege	History
Emily Fischer	Atmospheric Sciences
Brian Foy	Microbiology, Immunology, and Pathology
Chris Funk	Biology
Kathy Galvin	Anthropology
Cameron Ghalambor	Biology
Scott Glick	Construction Management
Susan Golicic	Management
Neil Grigg	Civil and Environmental Engineering
Peter Hall	Sociology
Elizabeth Hobbs	Horticulture and Landscape Architecture
Thomas Holtzer	Bioagricultural Sciences and Pest Management
Amy Hoseth	Library
Adrian Howkins	History
Paul Hudnut	Management
Ruth Hufbauer	Bioagricultural Sciences and Pest Management
Nancy Irlbeck	Agricultural Sciences
Gene Kelly	Soil and Crop Sciences
Raj Khosla	Soil and Crop Sciences
Julia Klein	Ecosystem Science and Sustainability
Alan Knapp	Biology
Mary-Ann Kokoska	Art
Boris Kondratieff	Bioagricultural Sciences and Pest Management
Stephan Kroll	Agricultural and Resource Economics
Melinda Laituri	Ecosystem Science and Sustainability
Jan Leach	Bioagricultural Sciences and Pest Management
Katherine Leigh	Design and Merchandising
Dale Lockwood	School of Global Environmental Sustainability
Stephanie Malin	Sociology
Anthony Marchese	Mechanical Engineering
Katie McShane	Philosophy
Sue Ellen Melzer-Drinnen	Soil and Crop Sciences
Stephen Mumme	Political Science
Donald Mykles	University Honors Program
Mary Nobe	Construction Management
Barry Noon	Fish, Wildlife, and Conservation Biology
Troy Ocheltree	Forest, Rangeland, and Watershed Stewardship
Tara O'Connor Shelley	Sociology
Paul Ode	Bioagricultural Sciences and Pest Management
Dennis Ojima	Ecosystem Science and Sustainability
Erika Osborne	Art
Mehmet Ozbek	Construction Management
Merlyn Paulson	Horticulture and Landscape Architecture
Keith Paustian	Soil and Crop Sciences
Lori Peek	Sociology
Jennifer Peel	Environmental and Radiological Health Sciences
Liba Pejchar	Fish, Wildlife, and Conservation Biology
LeRoy Poff	Graduate Degree Program in Ecology
Jorge Ramirez	Civil and Environmental Engineering
Howard Ramsdell	Environmental and Radiological Health Sciences
Dave Randall	Atmospheric Science
Tony Rappe	Chemistry
Ravi Ravishankara	Chemistry
Laura Raynolds	Sociology
Ken Reardon	Chemical and Biological Engineering
Sarah Reed	Fish, Wildlife, and Conservation Biology
Kyle Saunders	Political Science
Meagan Schipanski	Soil and Crop Sciences
Andy Seidl	Agricultural and Resource Economics
Arathi Seshadri	Soil and Crop Sciences
Sybil Sharvelle	Civil and Environmental Engineering
Melinda Smith	Biology
Dimitris Stevis	Political Science
Peter Taylor	Sociology
Dawn Thilmany McFadden	Agricultural and Resource Economics
David Thompson	Atmospheric Sciences
Bill Timpson	School of Education
Craig Trumbo	Journalism and Technical Communication
Rodolfo Valdes-Vasquez	Construction Management
Sue VandeWoude	Microbiology, Immunology, and Pathology
Subhas Venayagamoorthy	Civil and Environmental Engineering
Diana Wall	School of Global Environmental Sustainability
Ellen Wohl	Geosciences

RESEARCH

The School invests in innovative research activities to advance global sustainability science, including cultivation of interdisciplinary partnerships, experimentation with new methods, and development of synthetic projects that integrate disparate knowledge and approaches.

Global Challenges Research Teams (GCRT)

Collaborative teams of faculty that build cross campus partnerships to address the world's most pressing regional and global environmental issues. The program provides seed funding to foster creative and innovative approaches to sustainability grand challenges and establish interdisciplinary relationships to conduct research in new areas and with expanded applicability.

$64k awarded | **6** GCRTs | **18** principal investigators from **11** departments & **5** colleges

Air Quality, Climate, and Health

Promoting multidisciplinary research on the interactions between forest ecosystems and human health, as mediated by wildfire and air quality, in addition to developing models and measures of wildfire impacts on society and environment.

Award: $12,000

Principal Investigators:
John Volckens, Department of Mechanical Engineering
Sheryl Magzamen, Department of Environmental and Radiological Health Sciences
Jeffrey Pierce, Department of Atmospheric Sciences
Emily Fischer, Department of Atmospheric Sciences
Monique Rocca, Department of Ecosystem Science and Sustainability

Research Areas: Climate Change and Energy; Biodiversity, Conservation, and Management

Air pollution is the greatest near-term environmental threat to human health and under a changing climate it is predicted that air pollution will worsen in the coming century. In Colorado and much of the western United States, the issue is compounded by a growing threat of wildfire, which affects air quality, and concerns over air quality potentially restrict the use of prescribed fire as a tool for reducing wildfire as well as managing for ecosystem services and biodiversity. The *Air Quality, Climate, and Health* research team formed an interdisciplinary group of faculty from across the University to research the interactions between forest ecosystems and human health from the perspective of air quality and wildfire in a changing climate. The team spent the 2014-15 year on workshops, retreats, and activities to galvanize their core faculty, stimulate innovative research concepts, and kick-start proposal writing efforts.

Key Accomplishments:
- obtained $3,241,497 in support from other sources
- published 6 manuscripts
- hired 2 graduate students and 2 postdoctoral fellows
- hosted 3 events with scientists and stakeholders

Freshwater Ecosystems

Developing a multidisciplinary framework to positively influence land and water management practices that enhance the quality and sustainability of riverine ecosystems.

Award: $15,000

Principal Investigators:
N. LeRoy Poff, Department of Biology
Brian Bledsoe, Department of Civil and Environmental Engineering

Research Areas: Land and Water Resources; Biodiversity, Conservation, and Management

The *Freshwater Ecosystems* research team, comprised of five CSU faculty members, four state and federal agency managers, and six graduate students, spent the 2014-15 year working to produce a group manuscript. Aquatic biodiversity is declining worldwide and flow regime modification (through dams and water abstraction) and nutrient pollution are leading causes. In order to achieve the U.S. Clean Water Act goals of "…restor[ing] and maintain[ing] the chemical, physical and biological integrity of the Nation's waters", this team argues that management for water quality and water quantity must be linked. Set for submission in fall 2015, the manuscript focuses on the need to link water quality and water flows to meet regulatory requirements for quality while also helping to sustain more resilient aquatic ecosystems. The team held a retreat in October 2014 and then met regularly during the year to strategize and develop themes. A key accomplishment included an economic analysis of the social and environmental tradeoffs of augmenting water flows to enhance water quality in the South Platte Basin. The manuscript will provide a fundamental framework for scientists and managers on how water quality regulations can be leveraged to enhance water flow management to promote freshwater ecosystem sustainability and resilience.

Some of the 2014-15 Global Challenges Research Team members and Resident Fellows

Climbers and Bat Conservation climbersforbats.colostate.edu

Developing collaborations of rock climbing interest groups, bat biologists, and land managers to strategically collect information on bat roost locations for conservation efforts and share this information with the climbing community

Award: $9,500

Principal Investigators:
Robert Schorr, Department of Fish, Wildlife and Conservation Biology and Colorado Natural Heritage Program
Bernadette Kuhn, Colorado Natural Heritage Program
Shawn Davis, Department of Human Dimensions of Natural Resources

Research Areas: Land and Water Resources; Biodiversity, Conservation, and Management

Colorado's bat biologists lack basic information on bat roost selection, leaving key questions about how to best manage and conserve these mammals. In light of the many threats to bat populations, such as disease and urban development, and the lagging scientific information about bat roost needs, the *Climbers and Bat Conservation* team is leveraging the climbing community to participate in data gathering and conservation efforts. *Climbers and Bat Conservation* spent 2014-15 cultivating relationships between Colorado's rock climbing community, bat biologists, and the public to generate new data on bat roosting ecology. This work has been recognized as the inaugural collaboration between climbers and bat biologists and continues to gain interest from climbing communities. The team facilitated discussions with stakeholders and found strong interest and support from the climbing community to form a better understanding of bat ecology in advance of the threats that bats are experiencing. Based on feedback from these meetings, the team identified a greater need for outreach efforts, and shared information about the project through meetings at climbing gyms and outdoor equipment retailers, communications materials, social media, and a website. The *Climbers and Bat Conservation* team uses iNaturalist and mail-in postcards to collect real-time data from rock climbers on bat activity along Colorado's Front Range.

Key Accomplishments:
- new records of bats roosting at cracks and crevices
- increase understanding and interest in conservation efforts by the climbing community

Environmental History, Ecology, and Sustainability in Public Lands

Promoting sustainability in public lands by bringing environmental historians into dialogue with sustainability scientists, specialists in the human dimensions of natural resource conservation, and natural resource managers.

Award: $10,000

Principal Investigators:
Ruth Alexander, Department of History, College of Liberal Arts
Jill Baron, Natural Resource Ecology Laboratory

Research Areas: Environmental Institutions and Governance; Sustainable Communities; Land and Water Resources; Biodiversity, Conservation, and Management

The *Environmental History, Ecology, and Sustainability* in Public Lands team convened historians, natural scientists, and managers to form a better understanding of the connections between changes in the physical environment and changes in humans' relationship to the environmental world around them. The management of public lands requires an understanding of both environmental and human history, and American landscapes are a palimpsest of past indigenous and immigrant activities, current climate change and other human disturbances, and changing human values. The research team, consisting of 17 academics and managers from three CSU colleges, the U.S. Forest Service Rocky Mountain Research Station, and Rocky Mountain National Park, met regularly to read and discuss relevant literature and see the synergies between history and science that can benefit management of natural lands in these times of global change. They addressed questions of sustainability – past, present, and future – in public lands in the Rocky Mountain region and arid Southwest including the U.S-Mexico borderlands. The team does not plan to continue, as they accomplished their goal and believe that the partnerships built will lead to new collaborative projects that will involve interdisciplinary engagement on campus, development of publications, interaction with land managers, and public outreach.

Key Accomplishments:
- 1 book chapter published
- hosted a 2-day symposium with CSU scientists and park managers

Environmental Justice CSU environmentaljustice.colostate.edu

Exploring how and why equity and environmental justice are important elements of the study of the environment, public health, and sustainability at CSU.

Award: $7,500

Principal Investigators:
Tara O'Connor Shelley, Department of Sociology
Melinda Laituri, Department of Ecosystem Science and Sustainability
Dimitris Stevis, Department of Political Science
Stephanie Malin, Department of Sociology

Research Areas: Climate Change and Energy; Food Security; Environmental Institutions and Governance

Equity and environmental justice refers to academic research and social activism on the distribution of environmental harms and benefits among humans and between humans and nature. The concept is subject to many interpretations as each discipline addresses environmental justice in its own way, producing in the process important yet fragmented bodies of literature. The *Environmental Justice CSU* team works to bridge disciplines to better recognize when concepts are similar, what the differences might be, and to identify synergies that will allow collaboration. Their primary goal is to raise the profile of equity and environmental justice at CSU and encourage interdisciplinary approaches to its research at the University. In 2014-15, the team established environmental justice as a lens from which to examine environmental issues across the University through a multitude of engagement activities.

Key Accomplishments:

- network grew from 27 to 70+ CSU affiliates representing all 8 colleges and 17 departments
- launched Environmental Justice CSU Roundtable Series and hosted three roundtables: Water Justice, Environmental Justice and the Built Environment, and Governance Justice
- partnerships built with 11 organizations and 4 universities along Colorado's Front Range
- established a social media presence through Facebook and Twitter
- principal investigator Stephanie Malin refined and finalized her book, *The Price of Nuclear Power: Uranium Communities and Environmental Justice*, with inspiration from the team
- presented 3 papers
- 8 events hosted with a combined 350 attendees

Conservation Development cd.colostate.edu

Balancing development with conservation in urbanizing landscapes by evaluating the ecological, economic, and social sustainability of alternative forms of development patterns in the places where people live and work.

Award: $10,000

Principal Investigators:
Liba Pejchar, Department of Fish, Wildlife and Conservation Biology
Sarah Reed, Department of Fish, Wildlife and Conservation Biology and North America Program of the Wildlife Conservation Society

Research Areas: Land and Water Resources; Sustainable Communities; Biodiversity, Conservation and Management

Conservation Development is comprised of 38 scholars and practitioners from five colleges and 10 departments at CSU, plus 12 external institutions. They define conservation development as an approach to the design, construction, and stewardship of a development that achieves functional protection of natural resources, while also providing social and economic benefits to human communities. To date they have been highly successful at developing a low-cost, high impact research and outreach program that is producing findings of both scientific importance and practical relevance for land conservation and sustainable development. The team is a regional and national resource for information and expertise regarding conservation development and positions CSU in a strong leadership role in the innovation of this rapidly evolving field.

Key Accomplishments:

- continued work with the City of Fort Collins' Nature in the City Initiative, including contributions to its strategic plan (passed by City Council, Mar. 2015) and launching the citizen science biodiversity project
- reviewed draft land-use regulations for Teton County, Wyoming in their role as Best Practices Advisors for the county
- held a workshop to convene leading experts on the effects of residential land-use on biological communities; the resulting report will communicate practical recommendations for how residential design and stewardship guidelines could be improved to protect native wildlife and habitats on private lands
- obtained $60,927 in support from other sources
- published 3 manuscripts and a blog post
- presented 3 papers and posters
- highlighted in a feature article in Ensia magazine, *Suburban sprawl doesn't have to be ecologically devastating* (2015)
- established as a SoGES working group

Visiting Fellows

Local and international scholars hosted by the School to collaborate and connect with faculty experts at CSU while they work on their sustainability-related research.

Pilar Andrés Spain

Jul. 2013-Sept. 2015

Pilar Andrés is a soil ecologist and senior researcher of the Center for Ecological Research and Forest Applications at the Autonomous University of Barcelona. As a Visiting Fellow (Marie Curie program, European Commission) she worked with Diana Wall, Department of Biology and Director of SoGES, and John Moore, Director of CSU's Natural Resource Ecology Laboratory and Ecosystem Science and Sustainability Department Head, and collaborated with other soil microbiologists and soil food web modelers at the University to evaluate effects of land use on soil food web structure, stability, and resilience to climate change in the short grass steppe. Preliminary results from this work were identified during the 2014-15 year and are being processed for publication.

Kevin Henry United States of America

Sept. 2013-Jun. 2015

Kevin Henry is Coordinator of Where the Rain Falls, an initiative of CARE International exploring the impacts of climate change on food security and human migration. Kevin's work as a Visiting Fellow focused on climate smart agriculture and in 2014-15 Kevin worked with Raj Khosla, Professor and Assistant Dean in the Department of Soil and Crop Sciences to facilitate CSU's charter membership in the Global Alliance for Climate Smart Agriculture, participated in the Climate Smart Agriculture Science Conference in Montpellier, France, and organized a panel on climate smart agriculture at the School's Future Earth symposium. He gave a guest lecture in the Sustainability and Ecosystems Science course ESS400 and published two manuscripts.

John Grant United States of America

Jan. 2015-present

John Grant is former Robert Kirby Professor of Strategic Management at the University of Pittsburgh. His current work focuses on interactions between organizational management and complexity of the natural world. As a Visiting Fellow, John is working with the School to assist with Future Earth efforts and is networking with business schools and colleagues to increase the recognition and need for collaboration with environmental sciences.

Resident Fellows

Faculty members engaged in creative sustainability research and problem solving. The program is designed to enhance scholarly contributions to sustainability by providing opportunities to accelerate progress and engage in the academic life of the School.

$22k awarded | **4** Fellows from **4** departments & **3** colleges

Philip Cafaro Department of Philosophy

Award: $4,000

Research Areas: Environmental Institutions; Governance; Biodiversity, Conservation, and Management

Philip Cafaro spent 2014-15 exploring the ethical arguments for species preservation within the disciplines of environmental ethics and conservation biology. His work focused on developing and updating arguments to protect biodiversity based on human moral responsibilities toward other species, which historically have played an important role in conservation efforts. During his year as a Fellow, Phil organized four events in conjunction with the SoGES Biodiversity Working Group. He also published two articles in environmental ethics and had a third accepted for publication in *Biological Conservation*, and published a book on immigration policy that deals with connections between population stabilization and ecological sustainability.

Delphine Farmer Department of Chemistry

Award: $6,000

Research Areas: Climate Change and Energy

Delphine Farmer's Fellowship focused on two separate topics: the implications of oil and natural gas development on Colorado's Front Range and developing a framework for the role of physical chemistry in sustainability. Her work on oil and gas utilized collaborations with government representatives to discover the information needed to make regulatory decisions for oil and gas development and its impact on regional air pollution. This work is ongoing and she is preparing two manuscripts for submission on the topic. During her fellowship, she gave an invited talk to the American Chemical Society, leading to new work on linking physical chemistry and sustainability. She gave four presentations at conferences related to this work in 2014-15.

Michael Gavin Department of Human Dimensions of Natural Resources

Award: $6,000

Research Areas: Environmental Institutions and Governance; Sustainable Communities; Land and Water Resources; Biodiversity, Conservation, and Management

Michael Gavin collaborates with faculty across the University to advance biocultural research at CSU and through an international working group as part of the International Union for Conservation of Nature Commission on Economic, Environmental, and Social Policy. The concept of biocultural conservation promotes the need for linked conservation efforts of biodiversity and cultural diversity, both of which are rapidly declining, and for which conservation efforts have historically happened in parallel despite their often inter-linked threats. Michael used his Fellowship to focus time cultivating cross-campus partnerships and significantly advance his research on biocultural diversity and conservation. Key accomplishments from this fellowship include obtaining $1,202,773 in external funding, two large events held, completion of six manuscripts (published or in press), and multiple presentations, one of which was a TEDx talk that has garnered 21,709 views on YouTube as of July 2015.

Erika Osborne Department of Art

Award: $6,000

Research Areas: Climate Change and Energy; Land and Water Resources; Biodiversity, Conservation, and Management

In her artistic and academic career, Erika Osborne investigates contemporary notions of land. Her artwork fosters sustainable solutions by creating public awareness of environmental issues that face the American West. In 2014-15, she engaged in creative research to connect with climate scientists, biologists, forest fire ecologists, and others to add to her Re-Manifesting Destiny series with two paintings that address climate change and the urban-wilderness interface. Additionally, Erika hosted and curated the exhibition Boundless Horizons, held in CSU's Clara Hatton Gallery, which brought together artists with field-based practices from the United States and Australia. She also attended the Art and Environment conference at the Nevada Museum of Art during her Fellowship.

"The Surveyor's Detritus" (2015) Erika Osborne
Oil on linen
35" x 54"

"On the Edge of the Sublime" (2015) Erika Osborne
Oil on linen
36" x 48"

Sustainability Leadership Fellows

A cohort of 20 advanced PhD students and early career Postdoctoral Fellows interested in communicating their sustainability-related research. The School provides state-of-the-art 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.

4th cohort | **20 Fellows from 15 departments & 6 colleges**

All 2014-15 Sustainability Leadership Fellows said they benefited significantly from the training curriculum. Most notably, Fellows reported improved ability to communicate their research with diverse audiences and colleagues from other disciplines, new perspectives on how their work can have an impact, and the long-term value of an interdisciplinary network of colleagues gained during the program. Fellows felt they walked away from the program better equipped with tools and ideas for how to tell the story of their research and were particularly excited about their improved ability to give a condensed and concise short narrative of their work.

"I have been focused primarily on research since the start of my PhD in 2010, perceiving outreach and scientific communication as a necessary but annoyingly obligatory task. After my Fellowship with SoGES, I realize it is an avenue to promote my research and is important for sustainability of all of our research programs."

Training Curriculum:

- Two-day intensive Science Communication Workshop *Sept. 18-19, 2014*
- Connecting Science and Policy | *Oct. 4, 2014*
  Barry Noon, Department of Fish, Wildlife, and Conservation Biology
- Time Management and Writing Productivity *Nov. 6, 2014*
  Sarah Reed, Wildlife Conservation Society and Department of Fish, Wildlife, and Conservation Biology
- Making Sure your Research is Seen and Heard: Visual Communication can be Inexpensive, Easy, and Fun | *Dec. 4, 2014*
  Joe Champ, Department of Journalism and Media Communication
- Communication drill: "2 Minutes to Describe Your Science to the CSU Provost" | *Dec. 10, 2014*
- Storytelling and Engaging your Audience *Feb. 10, 2015*
  John Calderazzo, Department of English and Changing Climates CSU
- Experiences from Previous SLFs | *Mar. 12, 2015*
  Kelly Hopping (2011-12), Paul Tanger (2012-13), and Katie Langin (2011-12)
- Proposals and Grant Writing | *Apr. 29, 2015*
  Alan Knapp, Department of Biology, Elizabeth Ryan, Department of Environmental and Radiological Health Sciences, and Peter Backlund, School of Global Environmental Sustainability

Additionally, Fellows each wrote a blog post and peer reviewed another's work for publication on the School's HumanNature blog.

2014-15 Sustainability Leadership Fellow cohort

Sustainability Leadership Fellow cohort

Wahid Awad
PhD Candidate, Department of Soil and Crop Sciences

Eleanor Campbell
PhD Candidate, Graduate Degree Program in Ecology

Jonathan Care
PhD Candidate, Department of Economics

Andrea Clements
Postdoctoral Fellow, Department of Atmospheric Science

Anna Fagre
PhD Student, Professional Veterinary Medicine Program

Travis Gallo
PhD Student, Department of Fish, Wildlife, and Conservation Biology

Brian Gill
PhD Candidate, Department of Biology & Graduate Degree Program in Ecology

Ashley Gramza
PhD Candidate, Department of Fish, Wildlife, and Conservation Biology

Timothy Hansen
PhD Candidate, Department of Electrical and Computer Engineering

Ch'aska Huayhuaca-Frye
PhD Student, Depart. of Anthropology & Graduate Degree Program in Ecology

Hannakaisa Lindqvist
Postdoctoral Fellow, Department of Atmospheric Science

David Martin
PhD Candidate, Department of Biology

Grace Lloyd Miner
PhD Student, Department of Soil and Crop Sciences

Joseph Northrup
PhD Candidate, Department of Fish, Wildlife, and Conservation Biology

Megan Ruxton
PhD Candidate, Department of Political Science

Joel Sholtes
PhD Candidate, Department of Civil and Environmental Engineering

Jason Sircely
Postdoctoral Fellow, Natural Resource Ecology Laboratory

Jennifer Tobin-Gurley
PhD Candidate, Department of Sociology

Tungalag Ulambayar
PhD Candidate, Department of Forest and Rangeland Stewardship

Kevin Wilcox
PhD Candidate, Department of Biology

"The program gave me confidence to be the expert I was educated to become … we were given practical advice and tools for how to share our science, who to share it to, what impacts it can have."

Global Soil Biodiversity Initiative (GSBI) globalsoilbiodiversity.org

A collaboration of international scientists dedicated to enhancing the use of soil biodiversity science and ecosystem services in policy and management of global terrestrial ecosystems. The Global Soil Biodiversity Initiative secretariat is housed at SoGES.

GLOBAL SOIL BIODIVERSITY INITIATIVE

Recent research and technological advances have vastly increased scientific knowledge on soil organisms, and highlight that changes to soil biodiversity and ecosystem functioning are occurring, especially in the context of climate change. The Global Soil Biodiversity Initiative encourages state of the art research from scientists internationally, while concurrently making that science relevant to the public, land managers, and policy makers. Scientific priorities include: identifying key knowledge gaps linking soil biodiversity and ecosystem function, developing a platform for synthesis of soil biodiversity data, methods harmonization, and establishing a forum for global research networks.

Groups

Soil Biodiversity Curation Working Group:
a global effort to bring together all soil biodiversity data - taxonomy, phylogeny and function

Early-Career Scientists:
officially launched at the First Global Soil Biodiversity Conference

Soil Protist Initiative:
increasing knowledge and transferring it to a wider audience

Soil Biodiversity Education:
enabling increased education of all people about soil biodiversity

Coming soon: Urban Soil Biodiversity, Methods Harmonization

FY 2014-15:

- membership grew to 705 scientists representing 88 countries; a 55% increase
- newsletter increased reach to 2,777 interested parties; a greater than 110% recipient increase
- social media presence grew to 1,141 Facebook Likes and 1,505 Twitter followers
- the website saw 12,000+ visitors from 165 countries, and a 64% increase in new users, resulting in over 45,000 page views

First Global Soil Biodiversity Conference: Assessing Soil Biodiversity and its Role for Ecosystem Services
Dec. 2-5, 2014
Organized by the GSBI, more than 700 scientists and interested parties from 57 countries gathered in Dijon, France to discuss current research in soil biodiversity and its links to earth processes. The conference included 13 keynote speakers, 46 oral presentations, and 666 poster presentations. More than half of the attendees were early career scientists. The final day of the conference celebrated World Soil Day and launched the UN designated 2015 International Year of Soils.

Global Soil Biodiversity Atlas
The GSBI, in collaboration with the European Union Joint Research Commission, is creating a Global Soil Biodiversity Atlas, which will present current scientific knowledge in a format accessible to the general public, policy makers, and scientists. The release is planned for fall 2015.

Africa 44; Asia 105; Australia & Oceania 35; Europe 261
North America 226; South America 34

Lecture at the First Global Soil Biodiversity Conference

The Africa Center africacenter.colostate.edu

A community of CSU faculty, students, community members, and African partners addressing issues of African biodiversity, conservation, health, and livelihoods.

THE AFRICA CENTER
FOR SUSTAINABLE ECOSYSTEMS & SOCIETIES UNDER GLOBAL CHANGE

MISSION
To enhance biodiversity, advance human and animal health, empower communities, and promote environmental, economic, and social sustainability.

Originally a SoGES Global Challenges Research Team (FY 2013-14), the Africa Center became an officially designated Center of the University in 2014.

Accomplishments for FY 2014-15 include:

- Graduate Student Fellowship program established and 4 Fellows selected: Adel Uhlarik, Peace Corps Master's International Program, College of Agricultural Sciences, Matt Luizza, Ph.D. Candidate, Graduate Degree Program in Ecology, Stephen Chignell, Master of Science student, Department of Ecosystem Science and Sustainability, and Renee Harmon, Ph.D. student, School of Education
- travel grant to attend the 2015 Ecological Society of America annual meeting awarded to Tewodros Wakie, Ph.D. Candidate, Graduate Degree Program in Ecology
- interactive map developed for the website featuring the breadth of CSU projects and research in Africa
- increased engagement with 114 Likes on Facebook and 231 subscribers to the newsletter, an 18% increase
- hosted 7 events and 6 coffee socials

Biodiversity Working Group (BWG) biodiversity.colostate.edu

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

BIODIVERSITY WORKING GROUP
Colorado State University

The Biodiversity Working Group spent FY 2014-15 increasing its presence on campus, engaging with the Fort Collins community, identifying new partners, and developing strategies to increase its impact regionally, nationally, and internationally. The working group held seven large events during the year.

MISSION
To advance understanding, conservation, and appreciation of life's variation, ranging from genetics and organisms to ecosystems and their interactions. It is important to maintain resilient ecosystems supporting a diversity of plants and animals, which enhances societal health and wellbeing, and strengthens human links to wild nature. The Biodiversity Working Group works to maintain and enhance biodiversity through research, policy advancement, education, and outreach.

Future Earth futureearth.org

The global research platform providing the knowledge and support to accelerate our transformations to a sustainable world. The U.S. global hub is jointly housed at SoGES and University of Colorado, Boulder.

futureearth
research for global sustainability

Supported through a grant from the National Science Foundation

Future Earth is a 10-year international initiative to coordinate new, interdisciplinary actionable science efforts and solutions to sustainability research and global environmental change. Future Earth will generate knowledge in partnership with society and users of science, featuring co-design and co-delivery with stakeholders throughout the research process. The program:

- is a coordinated scientific and societal response to global environmental change
- brings together a global network of scientific projects and communities working across the natural and social sciences
- will intensify the impact of research by building and connecting global knowledge
- will accelerate sustainable development at global, regional, national and local levels
- features active involvement of researchers and stakeholders during the entire research process
- is more nimble and responsive to the challenges of sustainability
- increases transparency in research and governance

Future Earth is organized by the International Science Council in partnership with members of the Science and Technology Alliance for Global Sustainability, an international partnership of funding bodies and United Nations organizations that sponsor major global environmental change activities. An international secretariat is jointly hosted by the U.S., Sweden, Japan, France, and Canada. The U.S. hub is managed by and resides within the School of Global Environmental Sustainability at CSU and the Sustainability, Energy and Environment Complex at CU-Boulder.

Josh Tewksbury, Director,
Colorado Global Hub, Future Earth

Research Professor, University of Colorado, Boulder
Senior Scholar, School of Global Environmental Sustainability, Colorado State University

Josh comes most recently from the Luc Hoffman Institute at the World Wildlife Fund and the College of Environment and Department of Biology at the University of Washington. His active research focuses on the ecological impacts of climate change on tropical and temperate communities, the impacts of species loss on long-term ecosystem dynamics, and the effectiveness of landscape connectivity.

Dennis Ojima, Secretariat Implementation Team, Colorado Global Hub, Future Earth

Professor, Department of Ecosystem Science and Sustainability, CSU
Senior Research Scientist, Natural Resource Ecology Laboratory, CSU
University Director, North Central Climate Science Center

Dennis' research involves application of social ecological system approaches to climate and land use changes on ecosystems around the world, carbon accounting, and adaptation and mitigation strategies to climate change.

EDUCATION

The School is actively involved in educating and equipping students with knowledge and tools to tackle sustainability challenges by offering interdisciplinary sustainability curricula, promoting the development and integration of sustainability concepts into courses across campus, and working to increase the breadth of programs for all levels of students.

In FY 2014-15 the School taught three new Global Environmental Sustainability courses, collaborated with the Water Center to create and support the Sustainable Water Interdisciplinary Minor, developed two new courses in collaboration with the EcoLeaders program in CSU's Housing and Dining Services, and hosted two sessions of the Pre-college Summer Sustainability Program.

Global Environmental Sustainability Minor (GES)

Providing students with core knowledge to address real world sustainability challenges, preparing students today to make a difference tomorrow. The minor is a 21-credit sequence with course offerings from 25 different subject codes across all 8 colleges, providing depth in learning and allowing students to tailor coursework to augment their interests.

67 graduates | **31%** enrollment increase | **249** students from **45** different majors

Students enrolled in the GES minor come from all 8 colleges and 45 different majors. In the 2015 GES minor exit survey, 100% of graduating seniors said they believe the minor will help them get a job or graduate position.

GES Courses

GES 101: Foundations of Global Environmental Sustainability *Offered online & classroom style*

GES 101 provides a comprehensive survey of issues in global sustainability and lays the groundwork for a firm understanding of sustainability grand challenges. Open to all students at CSU, the introductory course in the GES minor also exposes students to curricular opportunities across all eight colleges.

176 students enrolled in fall 2014
126 students enrolled in spring 2015
To date, 1,395 CSU students have completed GES 101.

SoGES leadership and GES Minor graduates

GES 180-A1: Sustainable Energy
New course

Established this year, GES 180-A1 introduces students to the basics of energy production and evaluates the sustainability of different sources of energy, including renewable energy. The course explores energy storage, transmission, pollution, and conversion and students are introduced to life-cycle analysis, policies, regulations, and economics of energy production.

GES 180-A2: Introduction to Sustainability Engagement
New course

The GES 180-A2 one-credit course was created to support the EcoLeaders Program run by CSU's Housing and Dining Services. The course teaches students, selected as EcoLeaders for their dormitories, about campus sustainability efforts and how local actions are connected to global issues in sustainability.

GES 380-A1: Sustainability in Practice/ GES 381 Practicum
New course

The newly created variable credit GES 380-A1 focuses on implementing sustainability projects on campus. GES and EcoLeader students propose and implement projects to educate students and increase the operational sustainability of campus life.

GES 470: Applications of Environmental Sustainability

GES 470 concentrates on practices and problem solving for environmental sustainability and emphasizes assessment tools, decision-making, and best practices. The GES minor capstone course accepts a limited class size for more focused coursework and interdisciplinary student teams. In FY 2104-15, the School added a fall offering of GES 470 to accommodate the growing number of students enrolled in the GES minor.

67 students enrolled in spring 2015
To date, 210 students have completed GES 470.

GES 520: Issues in Global Environmental Sustainability

GES 520 is open to all graduate students across campus. It is a dynamic course that provides students with a deep understanding of sustainability issues, placed in broader economic and social context.

Course Endorsement

The School endorses courses with strong sustainability content. There are 57 GES-endorsed courses across seven colleges. Endorsement is noted in the course catalog and on student's transcripts, attracting additional students to these courses and allowing employers and graduate programs better insight into the value of courses taken.

"GES was the best all around sustainability education."

Sustainable Water Interdisciplinary Minor (SWIM)

SWIM was created by the CSU Water Center in FY 2014-15 and is academically housed in the School, a collaboration that increases efficiency with academic coordination handled by the SoGES Curriculum Committee and content-relevant advising by Water Center staff. Minor students learn about water issues from social, political, economic, and ecological perspectives, and gain holistic knowledge of the complexities of water management and use.

Pre-college Summer Sustainability Program

An 8-day hands-on experiential program for high school students to learn about sustainability from CSU's leading experts. Students spend the week interacting with sustainability scientists to understand topics ranging from climate change to governance to biodiversity, hiking, and river rafting. The program exposes students to university life, opportunities to incorporate sustainability into their fields of study and career track, and a fun week of personal and professional development.

34 students from **17** states | **8** days | **3** scholarships awarded

The 2015 Pre-College Summer Sustainability Program introduced students to a wide breadth of concepts in sustainability science and reinforced and added depth to their interest in the subject. In addition to teaching high school students about sustainability, the program encourages students to attend college, incorporate sustainability into their lives and career path, and showcases CSU's strengths as a leading university in environmental science and sustainability. Lessons in the 2015 curriculum were wide ranging, including an international climate negotiations simulation, lectures from professors about climate change, soils, and agriculture, hands-on experience plotting invasive species at Horsetooth Reservoir in Fort Collins, and an in-person look at snow pack ecology in Rocky Mountain National Park.

In their exit surveys, all 34 students reported a better understanding of environmental sustainability and all 34 said that they plan to incorporate sustainability in their own education or career. Additionally, all 34 ranked their experience as either "positive" or "very positive" overall, and they stated almost unanimously that they were more likely to attend CSU as a result of the program. Students were satisfied with the Pre-College Summer Sustainability program, enthusiastic about ways they might incorporate sustainability into their future, and found their week at CSU fun, engaging, and enlightening.

"Not only did I get a better understanding [of sustainability], but I was able to see how it can be applied to all aspects of society. "

Session I: *Jun. 23-Jun. 30, 2015.* 16 students
Session II: *Jul.7-Jul. 14, 2015.* 18 students

Geographic distribution of students

Arizona (1), California (6), Colorado (6), Florida (3), Illinois (3), Iowa (1), Maryland (1), Massachusetts (1), Michigan (1), New Jersey (1), North Carolina (1), Ohio (2), Pennsylvania (1), Texas (2), Vermont (1), Washington (1), Wisconsin (2)

"This week has taught me a lot about environmental sustainability and has changed my view on it. I want to major in some sort of environmental science and hopefully go into a career in that field."

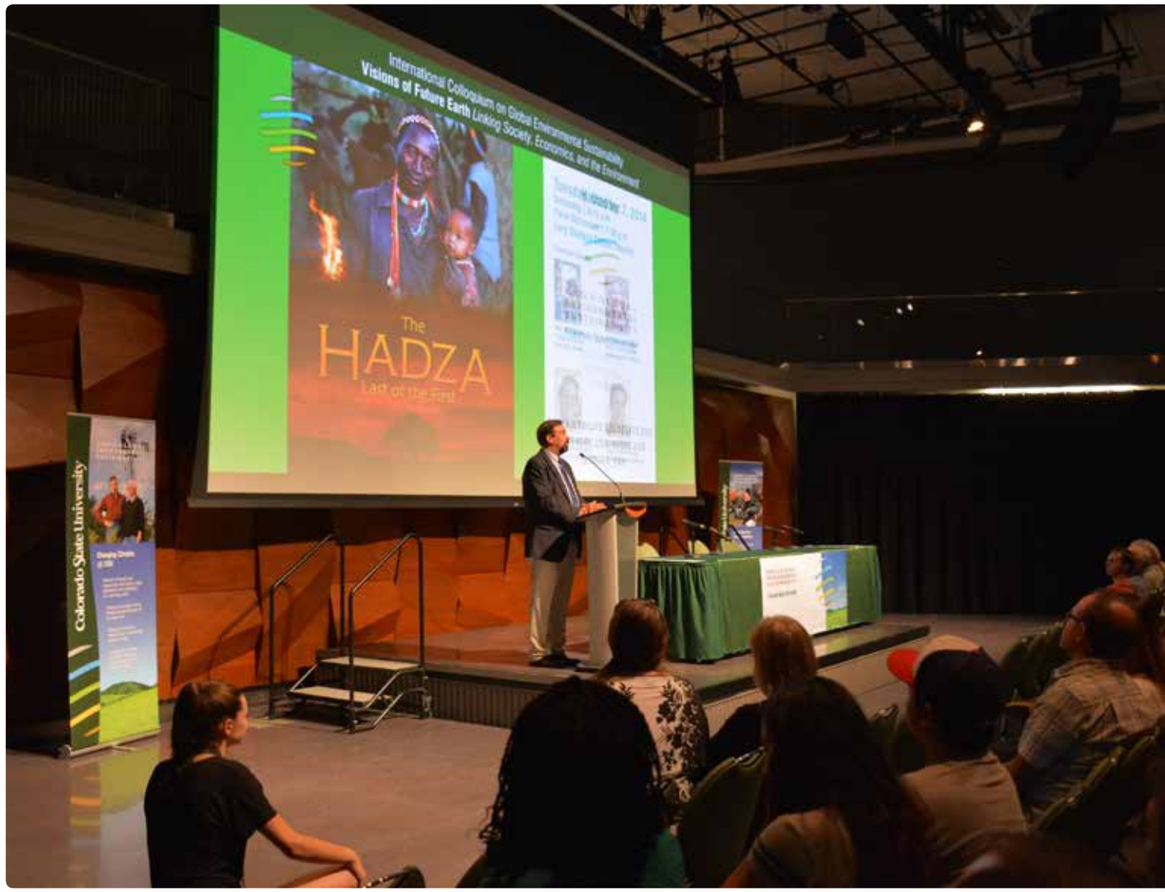
"This was my favorite activity I have ever done during any summer. Thank you."

Session I students exploring invasives at Pineridge Reservoir

Session II group photo in the Rocky Mountain National Park

ENGAGEMENT

The School promotes dialogue about Sustainability with the local and global communities through an extensive number and diversity of events, ongoing discussion with a wide variety of stakeholders, and an active and dynamic online presence.



Dining with Sustainability

A monthly dinner series convening researchers and managers across Northern Colorado working in areas of environmental sustainability

Made possible by the generosity of the Bohemian Foundation

Dining with Sustainability dinner

Dining with Sustainability dinners provide sustainability experts from the University, federal and local agencies, and the non-profit and private sectors an opportunity to:

1. Establish and strengthen networks
2. Identify opportunities for collaboration and information-sharing
3. Promote creative and innovate approaches to one's work
4. Inspire research, enterprise, and collegiality

Each dinner is loosely structured to promote exchange of ideas and generate conversation through both small and large group formats over the course of the evening. The School circulates participant lists and food for thought in advance of each dinner and houses a full list of active participants on its website. The program covers dinner and refreshments, the event is casual and fun, and participants regularly stay well beyond the 2.5 hour timeframe to continue discussions.

Four dinners were hosted in Spring 2015. The School accepts approximately 20 participants for each event, selected to assure disciplinary and organizational diversity and encourage active interaction. Spring 2015 participants came from:

- Colorado State University (21 departments across 7 colleges)
- federal agencies (U.S. Forest Service, U.S. Geological Survey, U.S. Fish and Wildlife Service, National Parks Service)
- state agencies (Colorado State Forest Service, Colorado Parks and Wildlife)
- local agencies (City of Fort Collins, Larimer County)
- non-profit, non-governmental, and private organizations (Trees Water and People, Brendle Group, Rocky Mountain Innosphere, CARE International, and several small businesses)

Participant surveys consistently reported new connections established, stimulating conversations, and overall enthusiastic reviews of the program and opportunity to engage with a community of experts working in sustainability science.

"Literally met an entirely new group of people passionate about their work and extremely willing to both share their perspectives and freely offer their expertise."

"I hope that there is a long future ahead for the Dining with Sustainability dinner series, I think that it is a very important forum where the exchange of ideas is facilitated in a way that the obligations of the normal workday does not allow."

Student Sustainability Center

A University-wide, student run organization dedicated to empowering students to engage in sustainability activities and innovation. It involves students in volunteer projects, hosts events to raise awareness about sustainability, consolidates and distributes sustainability-related information and news, and builds relationships across campus to promote environmental initiatives. The Student Sustainability Center is housed at SoGES.

6 officers | **907** email subscribers | **10** events | **~740** attendees

The Student Sustainability Center is larger and more impactful than ever, with increased connectivity on campus and expanded projects and goals. In FY 2014-15 the Center continued development of a Student Sustainability Database that houses sustainability projects, leaders, and student organizations, and created a Sustainability Events Calendar for events from across campus to help students get involved. They developed and distributed signage with recommendations to reduce water and electricity use and placed them in campus buildings that experience high levels of student traffic. Additionally, the Center initiated the CSU Nitrogen Footprint Project to develop a comprehensive nitrogen footprint for the University as well as goals to reduce CSU's footprint under the advisement of Jill Baron, Natural Resource Ecology Laboratory. This project is part of a broader effort by the U.S. Environmental Protection Agency to reduce nitrogen output at institutions across the country.

Key Accomplishments:

- "Leave the Plastic – Plant a Tree" campaign to reduce the use of single-use plastic bags in CSU's Lory Student Center bookstore. Successfully ceased distribution of ~32,000 plastic bags and raised ~$1,600 to purchase trees for CSU's annual Arbor Day tree planting
- 35% increase in Green Bulletin newsletter subscribers
- expanded its leadership team: a director, 2 associate directors, a student organization liaison, an event coordinator, and a secretary
- social media presence grew to 609 Facebook Likes, a 17% increase
- increased club attendance, averaging 18-20 people per meeting

SUSTAINABILITY CENTER

Student Sustainability Center officers educating students on environmental effects of the use of plastic bags

Website

sustainability.colostate.edu

In FY 2014-15 the School website experienced:

- 52,068 visits, a 12% increase
- visits from 194 countries, a 9% increase
- international traffic constituted 21% of total visits

The website houses 159 archived event and educational videos, which received 1,742 views during the year.

Blog

blog.sustainability.colostate.edu

In FY 2014-15 the HumanNature blog had:

- 25 sustainability science-related posts from CSU faculty and students
- 4,371 visits, a 42% increase
- international traffic constituted 41% of total visits

Social Media and Correspondence

In FY 2014-15 the School's social media had:

- 2,753 subscribers to the School email list and newsletter, a 46% increase
- 1,177 Facebook Likes, a 17% increase
- 1,467 Twitter followers, a 27% increase

Media Mentions

In FY 2014-15 the School had:

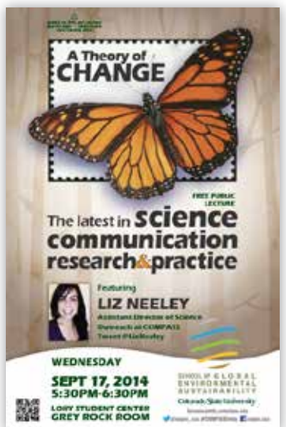
- 175 mentions in the media, a 60% increase
- 36 SOURCE/Today@Colorado State mentions
- 10 *Coloradoan* mentions
- featured stories in: *NPR, Washington Post, Scientific American, The Scientist, Wall Street Journal, International Business Times, Boston Business Journal* and *Bloomberg News*

Events

In FY 2014-15, School conference rooms were used 165 times for sustainability-related meetings and events, totaling 317 usage hours, for groups from across campus and the community. The School provided audio-visual support for 98 of these meetings. Additionally, School conference rooms were used 125 times for School-initiated meetings and events, totaling an additional 171 usage hours.

Public events held nearly doubled from the previous year. These included 16 panels, 13 receptions, 15 guest lectures, 4 workshops, and 8 symposia, film screenings, ceremonies, and showcases.

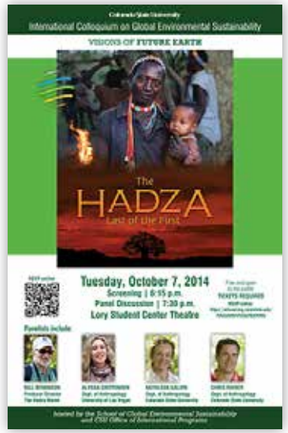
56 public events | **24** SoGES events | **32** co-hosted events | **4,387** total attendees



attendees **90**

attendees **90** planery session
9 coffee social

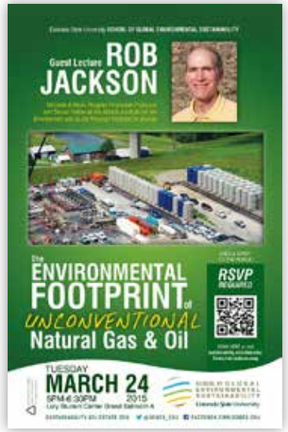
attendees **65** panel
44 workshop



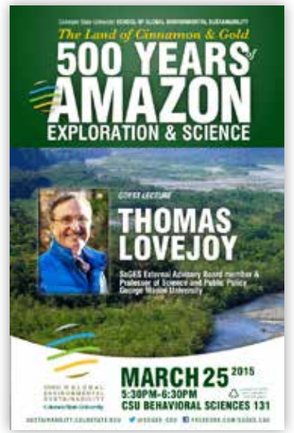
attendees **325**

attendees **75**

attendees **23**

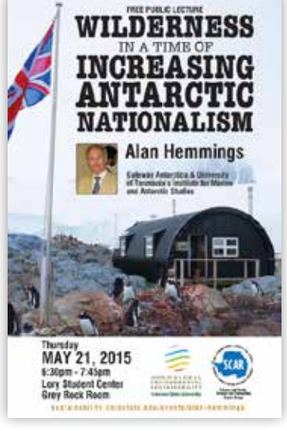


attendees **150**

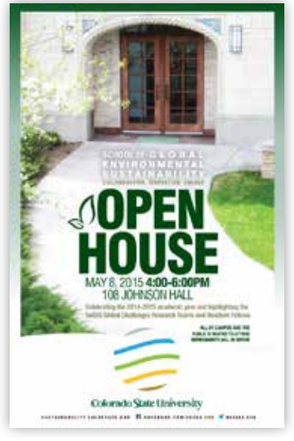


attendees **165**

attendees **150**



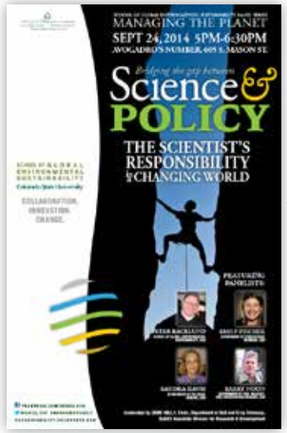
attendees **50**



attendees **90**

attendees **50**

Managing the Planet Panel Series *Addressing the most current sustainability issues with diverse panels of CSU experts and designed for engagement with the local community.*

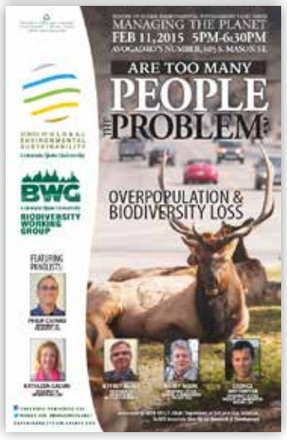


attendees **100**

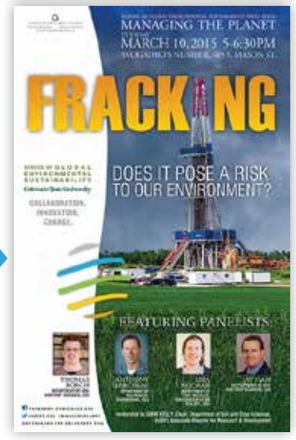
attendees **95**

attendees **130**

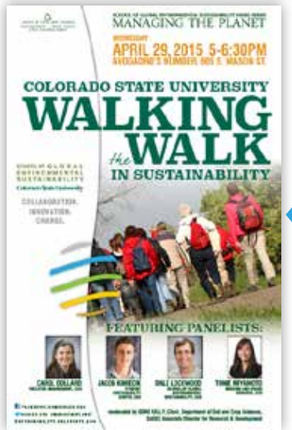
attendees **105**



attendees **175**



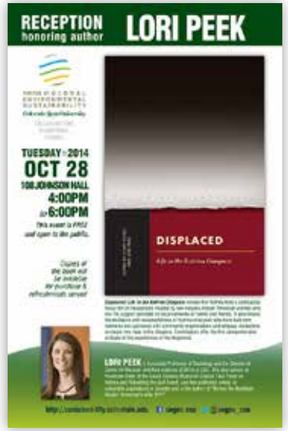
attendees **240**



attendees **105**

November 12, 2014 Managing the Planet panel

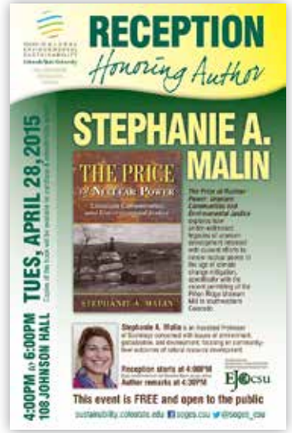
Distinguished Author Series *Celebrating CSU's authors and their recently published works.*



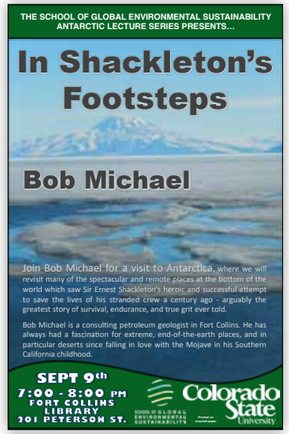
attendees **45**

attendees **35**

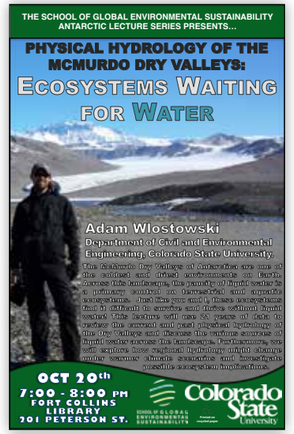
attendees **50**



Antarctic Lecture Series *Discussing life and work 'on the ice' with invited Antarctic researchers.*

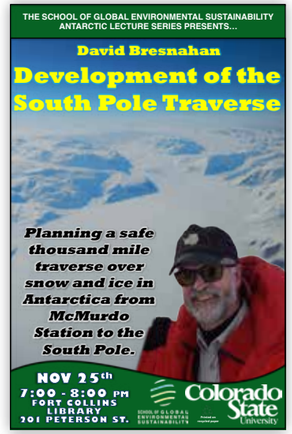


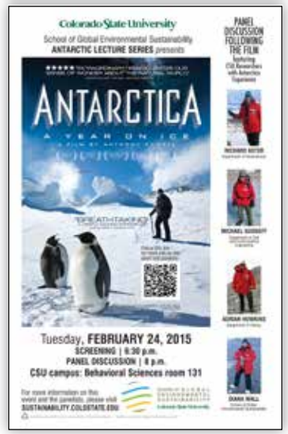
attendees **55**



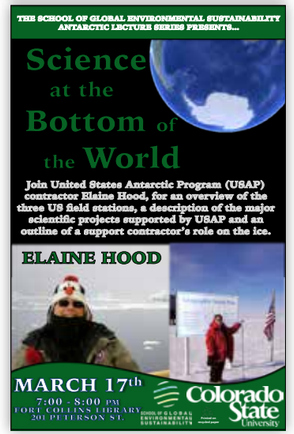
attendees **50**

attendees **75**



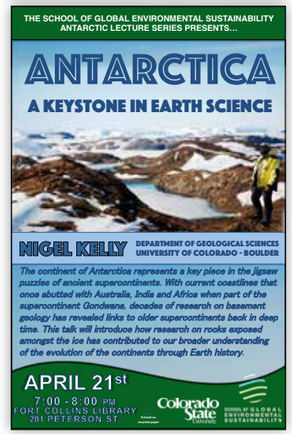


attendees **317**



attendees **20**

attendees **65**



Research Team, Fellow, and Working Group Events

The School offers a significant level of event planning, design, and marketing support for faculty and student held sustainability events.

GCRT: Environmental Justice CSU

A political ecology of conservation in Northern Argentina | Nov. 11, 2014
Guest lecturer: Marc Hufty, Graduate Institute for International and Development Studies, Geneva. Co-sponsored with the Environmental Governance Working Group, the Biodiversity Working Group, and the Public Lands History Center.

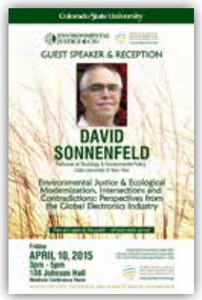
The status of environmental justice | Dec. 3, 2014
Brown bag discussion with Andrew Szasz, University of California, Santa Cruz.

Water as a human right | Dec. 7, 2014
Lecture in celebration of International Human Rights Day, Neil Grigg, Department of Civil and Environmental Engineering. Co-hosted with the United Nations Association of the United States, Northern Colorado Chapter and the ACLU of Northern Colorado.

Environmental justice and ecological modernization, intersections and contradictions: Perspectives from the global electronics industry | 45 attendees | Apr. 10, 2015
Guest lecture: David Sonnenfeld, State University of New York.

Environmental justice where we live, work, and play | Apr. 23, 2015
Panel discussion with George Middendorf, Howard University, and Charlie Nilon, University of Missouri. Co-hosted with Women, Population, and the Environment.

Environmental justice and governance amid shifting political economies | May 1, 2015
Roundtable discussion as part of the Front Range Conference on Environmental Governance Research held by the Environmental Governance Working Group. Panelists: Andreas Rechkemmer, University of Denver, Corina McKendry, Colorado College, Dimitris Stevis, Department of Political Science, Stephanie Malin, Department of Sociology, Tara Shelley, Department of Sociology.



GCRT: Environmental History, Ecology, and Sustainability in Public Lands

Environmental history, ecology, and sustainability in public lands | 165 attendees | Apr. 22-23, 2015
Symposium featuring keynote speaker Ben Minteer, Arizona State University.

GCRT: Air Quality, Climate, and Health

FIREX wildfire smoke field experiment planning workshop | Feb 3, 2015
One-day meeting to facilitate communication between CSU and National Oceanic and Atmospheric Administration researchers on the upcoming NOAA FIREX campaign. Research priorities and funding strategies were discussed in advance of the proposal call.

Air pollution health effects and health effects of wildfire smoke | 90 attendees | Feb. 26-27, 2015
Guest lecturer: Michael Brauer, University of British Columbia gave two invited lectures: "The Global Burden of Disease from Air Pollution", and "The Health Effects of Air Pollution from Wildfire Smoke".

Wildfires, air quality, climate, and health stakeholder workshop at CSU | Planned for Aug. 2015

Resident Fellow: Michael Gavin

Local and traditional knowledge: Bridging with Science | 75 attendees | March 26, 2015
Department of Human Dimensions of Natural Resources Spring 2015 Seminar Series. Guest lecturer Fikret Berkes, Distinguished Professor and Canada research Chair, University of Manitoba.

Why does culture matter for environmental conservation?
85 attendees | Apr. 14, 2015
Panelists: Sebastian Africano, International Director, Trees, Water, and People; Jamie Folsom, National Director, Trees, Water, and People; Michael Gavin, Associate Professor, Human Dimensions of Natural Resources, CSU; Michael Manfredo, Professor and Department Head, Human Dimensions of Natural Resources, CSU; Jeff Snodgrass, Professor, Department of Anthropology, CSU; Rosa Maria Vidal, Executive Director, Governor's Climate and Forest Fund and founder of Pronatura Sur.

Biodiversity Working Group

Biodiversity Without Borders: A Global Problem Demanding Global Solutions | 75 attendees | Oct. 6, 2014
Session in the International Colloquium on Global Environmental Sustainability, Visions of Future Earth.

Coffee Social with Terry Chapin | 27 attendees
Nov. 19, 2014
Terry Chapin was the keynote speaker for the Natural Resource Ecology Laboratory Award of Excellence in Ecosystem Science Nov. 20, 2014.

The Human Wedge: How Human Population Growth is fueling Mass Extinction | 65 attendees | Feb. 11, 2015
A lecture by Jeffrey McKee, Department of Anthropology, Ohio State University.

Policy workshop | 20 attendees | Apr. 18, 2015
A workshop for faculty, Postdoctoral Fellows, graduate students, and agency biologists on communicating science to policy makers, the media, and the public; how to navigate the often tricky policy realm; and how to engage in science that will make a difference.

BeePLUS workshop: Bee pollinator landscaping for urban sustainability | 75 attendees | Apr. 24, 2015
Discussion of recent bee declines, the biology of pollinators, and how to design your garden to make it attractive to pollinators.

How Many is too Many? Environmentalism and Domestic Population Policy in the United States
80 attendees | April 30, 2015
A panel discussion based on the book by Philip Cafaro, *How Many is Too Many? The Progress Argument for Reducing Immigration into the United States*.

Biodiversity IGNITE | 130 attendees | May 6, 2015
A spectacularly popular event featuring 10 short and dynamic biodiversity talks by CSU faculty and researchers.

The Africa Center

People matter: Transformations to social-ecological sustainability | 75 attendees | Oct. 7, 2014
Session in the International Colloquium on Global Environmental Sustainability, Visions of Future Earth.

Ebola in context | 120 attendees | Nov. 13, 2014
Panel discussion

Dryland collaborative institutions and innovative transformation to sustainability | 32 attendees
Jan. 28-31, 2015
International workshop of academics, scholars, managers, and practitioners of dryland collaboratives from Mongolia, Kenya, and the United States to discover, dream, design, and deliver research for a Knowledge Network for addressing natural resource problems in global drylands.

Earth matters: Land as material and metaphor in the arts of Africa | 60 attendees | Mar. 4, 2015
Lecture and reception with visiting scholar Karen Milbourne, curator at the National Museum of African Art, Smithsonian Institution and co-sponsored by the University Center for the Arts.

Community engagement and extension workshop at the University of Nairobi | Mar. 23-26, 2015
Co-sponsors of a workshop at the University of Nairobi with Hawassa University and CSU to develop new strategies for engagement.

What is new at Laetoli World Heritage Site: Do we really need research and new conservation strategy for the Laetoli hominid footprints? | 70 attendees | Apr. 24, 2015
Guest lecturer Charles Musiba, Department of Anthropology, University of Colorado Denver.

Collaborating with traditional healers to enhance surveillance for plague in NW Uganda
60 attendees | Apr. 29, 2015
Guest lecturer Mary Hayden, National Center for Atmospheric Research, Boulder, CO.

Student Sustainability Center booth at a local event

Student Sustainability Center members

Student Sustainability Center Events

Film: "GrowthBusters" | 76 Attendees | Oct. 2, 2014
Film screening followed by discussion with the producer, Dave Gardner.

Christman Field solar array tour | 22 Attendees
Oct. 22, 2014
Tour of CSU's 5.3-megawatt solar array

Mindful movie: "Waste Land" | ~30 Attendees
Nov. 12, 2014
Film screening in partnership with the City of Fort Collins

Film: "Disruption" | ~35 Attendees | Dec. 2, 2014
Film screening in partnership with Fort Collins Organizing for Action followed by a panel discussion on policy changes necessary to combat climate change.

Fort Collins: On the front lines of climate change
101 Attendees | Feb. 26, 2015
In partnership with Environment Colorado, hosted a panel of local citizens who have been affected by climate change followed by a workshop to develop ideas to combat sustainability issues in the Fort Collins community.

Chico Mendes reforestation project | ~30 Attendees
Mar. 2, 2015
Talk by members of the Chico Mendes Project in Guatemala discussing connections between reforestation, climate change, and indigenous rights. Hosted in partnership with the City of Fort Collins and local sustainability groups.

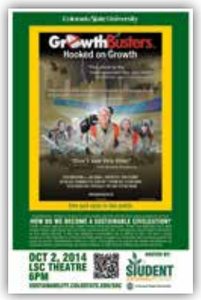
Mindful movie: "Colorado River" | ~25 Attendees
Mar. 24, 2015
Movie screening in partnership with the City of Fort Collins.

Sustainable Futures Fair | 200+ Attendees | Apr. 20, 2015
Career fair organized by student David Nocella with support of the Center, with representation from 27 companies, followed by a panel discussion with industry leaders.

Booth at CSU Earth Day festival | 200+ Attendees
Apr. 22, 2015
Interactive display booth at the CSU Earth Day festival.

Mindful movie: "Symphony of the Soil" | 20 Attendees
Jun. 9, 2015
Movie screening in partnership with the City of Fort Collins.

Student Sustainability Center member planting a tree that was earned by "Leave the Plastic Plant a Tree" campaign



OPERATIONS

Staff

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Fiscal and Operations Manager

Aleta Weller
Research and Outreach Coordinator

Dale Lockwood
Academic Coordinator; Instructor, Department of Biology

Kristin Pintauro
Communications Coordinator

Allison Burford
Administrative and Event Coordinator

Ryan Deming
Web and Video Coordinator

Michael Streight
Sustainability Outreach Coordinator

Tandra Fraser
Global Soil Biodiversity Initiative Executive Director

Carla Gamboa
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Student Sustainability Center Director

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Morgan Library

OPERATIONS

Finance Report

Description	Budget	Actual Expenses	Credits
FY15 BASE BUDGET	**$872,242.00**		
Salaries			
Employees - Director, Assoc. Directors		$400,875.37	
Employees - Staff		$269,089.13	
Postdoctoral Fellow		$24,375.00	
TOTAL		**$694,339.50**	
Research			
Global Challenges Research Teams		$64,000.00	
Resident Fellows		$22,000.00	
Sustainability Leadership Fellows		$26,684.57	
TOTAL		**$112,684.57**	
Education			
GES101, 470, 520 and GES101 Online (Professors and TAs)		$86,799.46	
TOTAL		**$86,799.46**	
Student Sustainability Center			
Salaries		$4,203.55	
Operations and Events		$5,255.17	
TOTAL		**$9,458.72**	
Pre-College Summer Sustainability Program			
Salaries		$19,643.24	
Operations and Supplies		$32,434.31	
TOTAL		**$52,077.55**	
PROGRAM ACTIVITES TOTAL		**$261,020.30**	
General Administration			
Supplies		$51,270.01	
Operating Charges (events, phone, data, etc.)		$64,509.01	
Travel		$39,583.67	
TOTAL		**$155,362.69**	
EXPENSE TOTAL		**$1,110,722.49**	
1X Monies			$73,959.00
Differential Tuition			$18,108.00
Pre-College Summer Sustainability Program Registration			$60,474.49
FY14 Carryforward			$130,925.00
Balance			**$44,986.00**
Balance for future commitments in FY16 $44,986			
Dinning with Sustainability Series			
(made possible with gift from Bohemian Foundation)	$15,712.21		
Spring 2015 Expenses		$6,117.43	
Balance			$9,594.78

GRANTS

GCRT: Air Quality, Climate, and Health

Ravishankara, Kreidenweis, Peel, Volckens, & Long: "Partnership for Air Quality, Climate and Health", CSU Office of the Vice President of Research Catalyst for Innovative Partnerships ($200,000).

Pierce, Fischer, Magzamen, & Volckens: "Downwind of the Flames: Assessing Wildfire Smoke Related Morbidity Using Satellites, In-Situ Measurements and Models", National Aeronautics and Space Administration ($1,200,000).

Rocca: Spatial Dynamics of Burn Severity and Post-fire Recovery in the High Park Fire Burn Area, National Science Foundation ($922,276).

Pierce: "Estimating the Effects of Changing Climate on Fires and Consequences for U.S. Air Quality, Using a Set of Global and Regional Climate Models", Joint Fire Science Program ($350,000).

Kreidenweis, Pierce: "Phase Dynamics of Wildland Fire Smoke Emissions and Their Secondary Organic Aerosols", Joint Fire Science Program ($220,000).

Fischer, Barnes, Pierce: "Planning for an Unknown Future: Incorporating Meteorological Uncertainty into Predictions of the Impact of Fires and Dust on U.S. Particulate Matter", Environmental Protection Agency ($349,221).

GCRT: Conservation Development

Nature in the City, City of Fort Collins ($32,061).

Human, wildlife, and land health in residential ecosystems. Colorado State University One Health Initiative. Idea flow proposal ($14,966).

Preserving nature in the city: A citizen science monitoring program to assess birds and butterflies in urban natural areas. Colorado State University Center for Collaborative Conservation ($5,900).

Facilitating adoption of land-use planning tools for conserving biodiversity and sustaining human livelihoods. Colorado State University Center for Collaborative Conservation ($8,000).

Resident Fellow: Michael Gavin

Max Planck Institute for the Science of Human History to study cultural transmission mechanisms ($203,631).

Towards an Integrated Understanding of Natural Resource Use and Management, National Science Foundation, 2015-2017 ($999,142).

PUBLICATIONS

GCRT: Air Quality, Climate, and Health

Franklin, J.E., Drummond, J.R., Griffin, D., Pierce, J.R., Waugh, D.L., Palmer, P.I., Parrington, M., Lee, J.D., Lewis, A.C., Rickard, A.R., Taylor, J.W., Allan, J.D., Coe, H., Walker, K.A., Chisholm, L., Duck, T.J., Hopper, J.T., Blanchard, Y., Gibson, M.D., Curry, K.R., Sakamoto, K.M., Lesins, G., Dan, L., Kliever, J., & Saha, A. (2014). A case study of aerosol scavenging in a biomass burning plume over eastern Canada during the 2011 BORTAS field experiment. *Atmospheric Chemistry and Physics*, 14(16), 8449-8460.

Gibson, M.D., Haelssig, J., Pierce, J.R., Parrington, M., Franklin, J.E., Hopper, J.T., Li, Z., & Ward, T.J. (2014). A comparison of four receptor models used to quantify the boreal wildfire smoke contribution to surface PM2.5 in Halifax, Nova Scotia during the BORTAS-B experiment. *Atmospheric Chemistry and Physics*, 15, 24043-24086, doi:10.5194/acpd-14-24043-2014.

Kodros, J.K., Scott, C.E., Farina, S.C., Lee, Y.H., L'Orange, C., Volckens, J., & Pierce, J.R. (2015). Uncertainties in global aerosols and climate effects due to biofuel emissions. *Atmospheric Chemistry and Physics Discussions*, 15(7),10199-10256.

Rocca, M.E., Brown, P.M., MacDonald, L.H., & Carrico, C.M. (2014). Climate change impacts on fire regimes and key ecosystem services in Rocky Mountain forests. *Forest Ecology and Management*, 327, 290-305.

Rocca, M.E., Miniat, C.F., & Mitchell, R.J. (2014). Introduction to the regional assessments: Climate change, wildfire, and forest ecosystem services in the USA. *Forest Ecology and Management*, 327, 265-268.

Sakamoto, K.M., Allan, J.D., Coe, H., Taylor, J.W., Duck, T.J., & Pierce, J.R. (2015). Aged boreal biomass burning aerosol size distributions from BORTAS 2011. *Atmospheric Chemistry and Physics*, 15, 1633-1646.

GCRT: Environmental History, Ecology, and Sustainability in Public Lands

Baron, J.S., T. Blett, W.C. Malm, R. Alexander, and H. Doremus (in press). Protecting national parks from air pollution effects: Making sausage from science and policy. In S. Beissinger (ed.) *Science for Parks, Parks for Science*. University of Chicago Press.

GCRT: Conservation Development

Feinberg, D.S., Hostetler, M.E., Reed, S.E., Pienaar, E.F., & Pejchar, L. (2015). Evaluating management strategies to enhance biodiversity in conservation developments: Perspectives from developers in Colorado, USA. *Landscape and Urban Planning* 136, 87-96.

Hostetler, M.E. & Reed, S.E. (2014). Conservation development: Designing and managing residential landscapes for wildlife. In R. McCleery, C. Moorman and N. Peterson (eds.) *Urban Wildlife Science: Theory and Practice* (pp 279-302). New York, NY: Springer

Pejchar, L., Reed, S.E., Bixler, R.P., Ex, L., & Mockrin, M.H. (2015). Consequences of residential development for biodiversity and human well-being. *Frontiers in Ecology and the Environment* 13(3), 146-153.

Resident Fellow: Philip Cafaro

Cafaro, P. (in press). Wild Nature. In A. Thompson & S. Gardiner (eds.), *Oxford Handbook to Environmental Ethics*. Oxford University Press.

Cafaro, P. (in press). Three ways to think about the sixth mass extinction. *Biological Conservation*.

Cafaro, P. (2015). How Many Is Too Many? *The Progressive Argument for Reducing Immigration into the United States*. University of Chicago Press.

Cafaro, P. (2015). Recent books on species extinction. *Biological Conservation*, 181, 245-257.

Cafaro, P. (2015). Environmental virtue ethics. In L. Besser-Jones & M. Slote (eds.), *The Routledge Companion to Virtue Ethics*. Routledge Press, 427-444.

Resident Fellow: Michael Gavin

Botero, C.A., Gardner, B., Kirby, K., Bulbulia, J., Gavin, M.C., & Gray, R.D. (2014). The ecology of religious beliefs. *Proceedings of the National Academy of Sciences, USA 111*(47), 16784-16789.

Gavin, M.C. (2015, April 13). *Defining biocultural approaches to conservation*. IUCN Newsletter.

Gavin M.C., McCarter J., Berkes F., Mead A., Stepp, J.R., Peterson, D., & Tang, R.. (2015). Defining biocultural approaches to conservation. *Trends in Ecology and Evolution 30*(3), 140-145.

McCarter J., & Gavin, M.C. (2014). In situ maintenance of traditional ecological knowledge on Malekula Island, Vanuatu. *Society and Natural Resources*, 27(11), 1115-1129.

McCarter J., & Gavin, M.C. (2014). Local perceptions of change in traditional ecological knowledge on Malekula Island, Vanuatu. *Ambio* 43(3), 288-296.

McCarter J., Gavin, M.C., Baereleo, S. & Love, M. (2014). The challenges of maintaining indigenous ecological knowledge. *Ecology & Society, 19*(3), 39.

Tang, R., & Gavin, M.C. (2015). Degradation and re-emergence of the commons: The impacts of government policies on traditional resource management institutions in China. *Environmental Science and Policy*, 52, 89-98.

Visiting Fellow: Kevin Henry

Lipper, L., Thornton, P., Campbell, B.M., Baedeker, T., Braimoh, A., Bwalya, M., Caron, P., Cattaneo, A., Garrity, D., Henry, K., Hottle, R., Jackson, L., Jarvis, A., Kossam, F., Mann, W., McCarthy, N., Meybeck, A., Neufeldt, H., Remington, T., Thi Sen, P., Sessa, R., Shula, R., Tibu, A., & Torquebiau, E.F. (2014). Climate-smart agriculture for food security. *Nature Climate Change 4*, 1068-1072.

Kerri L.S., Hodson, A.K., Bloom, A.J., Carter, M.R., Cattaneo, A., Chartres, C.J., Hatfield, J.L., Henry, K., Hopmans, J.W., Horwath, W.R., Jenkins, B.M., Kebreab, E., Leemans, R., Lipper, L., Lubell, M.N., Msangi, S., Prabhu, R., Reynolds, M.P., Solis, S.S., Sischo, W.M., Springborn, M., Tittonell, P., Wheeler, S.M., Vermeulen, S.J., Wollenberg, E.K., Jarvis, L.S., & Jackson, L.E. (2014). Climate-smart agriculture global research agenda: Scientific basis for action. *Agriculture and Food Security 3*(11).

Fund the Future

SUPPORT OUR PROGRAMS

Your gift will increase the School's capacity to advance sustainability science research, education, and engagement. Gifts can be general in nature or go directly to any program or initiative listed in this report. Thank you for considering a donation!

Gifts for research:

- Help faculty develop innovative solutions to sustainability grand challenges
- Prepare the next generation of scholars to translate science into action
- Building links across disciplines to strategically address sustainability issues

Gifts for education:

- Equip CSU graduates with a solid foundation in sustainability concepts
- Support state-of-the-art sustainability curriculum development
- Provide scholarships to pre-college leaders interested in learning about sustainability science

Gifts for engagement:

- Promote connections and collaboration between researchers and the public
- Foster a global community of forward-thinking citizens, ready to tackle the world's greatest challenges
- Deliver cutting-edge sustainability content to campus and the community

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