

**School of Global Environmental Sustainability
Colorado State University
Strategic Plan, 2015-2020**

Introduction

Achieving global environmental sustainability – maintaining the Earth’s environmental quality, functionality, and services over the long-term while meeting the human needs of today and tomorrow – is one of the greatest global challenges of the coming century. The School of Global Environmental Sustainability (SoGES) at Colorado State University, founded in 2008, is dedicated to addressing this challenge through scientific research, education, communication, and engagement. The school builds on the university’s long history of leadership in environmental science and education to promote and support sustainability studies that integrate the natural and social sciences, humanities, arts, and business.

A vast body of scientific evidence clearly shows that human society and the global Earth system are interdependent. Human activities are affecting the Earth’s environment and environmental conditions are important influences on human health and quality of life. The ongoing development of modern civilization has extended average life expectancy, created widespread prosperity, and reduced the percentage of global population who are poor and hungry, but has also resulted in extensive environmental damage. Humans have changed – and continue to change – the chemical composition of the atmosphere and oceans and altered more than half of the Earth’s land surface, leading to ongoing changes in global climate, fragmentation of habitat, and high rates of species extinction. The magnitude and rate of human-induced change poses clear threats to the viability of many of our planet’s ecosystems, even as science has provided compelling documentation of the valuable services and products they provide, including clean air, nutritious food, and fresh water.

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.**

How do we simultaneously enhance environmental quality, maintain economic growth, and improve the human condition? How do we preserve biodiversity in the world’s oceans and soils and safeguard the terrestrial and marine ecosystems that provide humankind with clean air, clean water, and other environmental services essential for survival? How do we provide the world’s poor with the energy they need to improve their lives without increasing emissions of carbon dioxide and exacerbating global climate change? How do we eliminate hunger and malnutrition in the face of growing populations while reducing the negative environmental impacts of agriculture?

The challenge of achieving sustainability is replete with these kinds of questions and trade-offs. Developing effective solutions requires improved understanding of the interplay of economic,

societal and environmental elements of sustainability and careful analysis of trade-offs among them. SoGES is addressing these needs by mentoring early career scientists, supporting development of new research, enabling deeper connections across disciplinary and institutional boundaries, fostering dialogue about sustainability issues with interested audiences, and employing advanced instructional methods to teach students about global environmental sustainability. We are a collaborative organization that works closely with and relies on partners and contributors from across CSU and beyond.

SoGES and CSU: Our school is a centerpiece of CSU's strong and growing commitment to sustainability science and education, and an important contributor to the university's strategic goals of natural resources stewardship and environmental and sustainability engagement. SoGES is a Special Academic Unit attached to and supported by the CSU President's Office. It consists of a small central staff, a larger group of faculty and scholars from all eight CSU colleges, and a group of students who are combining our Global Environmental Sustainability (GES) minor with 45 different majors. Our Director reports to the University Provost and we work closely with the Vice President for Research and other senior university leaders. Our staff members are active participants in the CSU President's Sustainability Committee and other campus-wide efforts to increase the university's sustainability.

Looking Ahead – SoGES 2020

Societal, faculty, and student interest in environmental sustainability is strong and increasing. Total attendance at SoGES events increased steadily over the last several years, totaling about 5,215 during 2015-2016. More than 100 CSU faculty members from all eight CSU colleges have chosen to become SoGES affiliate faculty. Requests for interdisciplinary seed funding and resident fellowships far exceed our current ability to provide such support. Enrollment in our GES minor is about 260, and we consistently have wait lists for our introductory survey course. We expect that the demand and need for sustainability information will continue to grow. Over the next 5 years, we aim to:

- **Increase our overall enrollment to about 1000 students, continue to develop and offer new courses, undergraduate minors, and graduate certificates, and investigate the creation of new graduate and undergraduate degree programs**
- **Increase the number of our affiliated faculty from about 100 to 200, increase our support for resident fellowship appointments, begin formal joint faculty appointments with CSU colleges, and create an endowed chair for the SoGES Director**
- **Increase our research budget from about \$450,000 to \$2 million per year to enable expanded support for seed grants, working groups, and centers, and initiation of larger research projects and post-doctoral appointments**
- **Add to our current mix of panel discussions, workshops, and lectures by organizing periodic large scale events that gather researchers, practitioners, sponsors, students, and other stakeholders and help bridge the gap between sustainability science and practice**
- **Enhance the depth and breadth of our communication activities through creation of new information products, such as review articles, assessments, and summaries of key issues, and continued experimentation with non-traditional dissemination, including video, radio, and social media interaction.**

Teaching and Learning

Current Efforts: We offer an interdisciplinary Global Environmental Sustainability (GES) minor that combines SoGES courses with relevant offerings from CSU colleges. Our GES courses draw on insights from multiple disciplines and include detailed consideration of the environmental, social, and economic elements of sustainability and the linkages among them. In addition to the six GES courses developed so far by the school, we have evaluated and endorsed a larger set of 57 courses, developed and taught by professors in seven of the eight CSU colleges, which provide similarly in-depth treatment of sustainability issues. SoGES also hosts a Sustainable Water Interdisciplinary Minor (SWIM), developed by the CSU Water Center. The GES and SWIM minors, GES courses, and larger set of endorsed courses provide students with many options to tailor sustainability studies to fit their interests.

Looking Ahead: Student interest in sustainability continues to grow and we are encouraging this growth because of the importance of sustainability education for the future of our community, state, nation, and planet. Our goal is to increase our total enrollment to over 1000 students (~3% of overall CSU student population) through improved marketing and expansion of our courses, degrees and certificate programs. Priorities for the next 5 years are to:

1. *Develop and begin offering new courses and undergraduate minor programs while continuing to offer the GES and SWIM minors.* We will begin offering a *Sustainable Energy Minor* in Fall 2016 (developed with the CSU Energy Institute). We are working with the Colorado School of Public Health to develop a *Minor in Sustainability, Environment and Public Health*, and we will continue to work with interested faculty to develop new GES courses at the undergraduate and graduate levels.
2. *Begin offering graduate-level certificates* in fall 2016. The first three certificates, each of which is a 9-15 credit sequence, are *Agriculture in a Global Stability Context*, *Natural Resources in a Global Stability Context*, and *Water Resources in a Global Stability Context*.
3. *Investigate the creation of new graduate and undergraduate degree programs.* Options under consideration include a non-thesis Masters degree in Global Environmental Sustainability and collaborative undergraduate majors combine GES courses with relevant courses from CSU colleges.
4. *Begin offering scholarships, fellowships, and research assistantships to students.* We see this as a very important for removing financial barriers and increasing the reach of our education efforts. We also believe that integration of education and research through undergraduate research opportunities and graduate fellowships is an effective means of supporting interdisciplinary education and enhancing integrated understanding of sustainability issues. Obtaining the necessary resources will be an important focus of our development efforts over the next several years.

Key Needs: As our student population continues to grow we will need additional funding to (a) support a larger pool of instructors, (b) increase the number of advisors and administrative staff, and (c) support additional class development and teaching by SoGES affiliate faculty based in CSU colleges. Funding for undergraduate and graduate scholarships, fellowships, and research assistantships is also critical. SoGES teaching and learning activities are already operating at near capacity. We consider it imperative to maintain a high quality educational environment that provides students with stimulating classroom experiences and easily accessible advice and mentoring.

Research and Discovery

Current Activities: Our main research objectives are to establish new connections and collaborations among scientists within CSU and with other institutions, develop new methods and approaches for research, assessment, and synthesis, and, ultimately, to create and provide useful information to address sustainability challenges. We have six broad areas of interest:

- Climate Change, Energy, and Society
- Food Systems, Land, and Water
- Environmental Governance and Justice
- Sustainable Communities, Landscapes, and the Built Environment
- Global Change, Environmental Quality, and Human Health
- Biodiversity and Ecosystem Services.

Each year we mentor about 20 early career scientists through our *Sustainability Leadership Fellows* program, support a small number of interdisciplinary projects through our *Global Challenge Research Team* program, provide financial support, office space and administrative services to *Resident Fellows* from within CSU, and host 2-4 *Visiting Fellows* from other institutions. We are also working with the University of Colorado (CU) to manage the *US Hub for Future Earth*, a large new international science program supported by National Science Foundation and other sponsors.

Looking Ahead: We aim to grow our research budget to about \$2 million per year by 2020, mainly by increasing support from external sponsors and donors, to enable expansion of seed funding and longer-term support for larger projects, working groups, and centers. Our top priorities are to:

1. *Grow our support for interdisciplinary Global Challenge Research Teams, working groups, and centers to about \$500,000 per year.* This will enable us to provide longer-term support of ongoing projects and working groups, including initiation of postdoctoral research appointments, and expand seed funding of new projects. Small projects that bridge disciplinary and organizational boundaries and define new approaches to difficult sustainability issues help build new intellectual communities within CSU and enhance the university's competitiveness in pursuing external funding for large-scale interdisciplinary research projects.

2. *Obtain additional external funding for the Future Earth Hub and for initiation of new, large-scale research efforts.* CSU has very strong research capacity that can be applied to sustainability challenges. Our collaborative cross-organizational structure provides a strong foundation for support and implementation of complex interdisciplinary projects.

3. *Work with current faculty and CSU colleges, schools, departments and centers to identify opportunities to strengthen sustainability research through recruitment of new faculty members and instructors.* CSU has a strong base of relevant scientific expertise; key hires should fill gaps or create new capabilities that complement existing strengths.

Key Needs: The most important need in this area is increased funding for seed grants, longer-term support for interdisciplinary working groups and centers, and initiation of interdisciplinary postdoctoral appointments. Recruitment of leading sustainability-oriented researchers to CSU is also important. Creation of endowed chairs in sustainability science and the ability to offer joint appointments to SoGES and CSU colleges would be a major step forward. Obtaining additional funding for research will be a major focus of our development activity over the next several years.

Outreach, Engagement, and Communication

Current Activities: SoGES has built a strong portfolio of engagement and communication activities. Our communication work highlights sustainability-relevant accomplishments and activities of researchers and faculty from across CSU and our engagement activities focus on connecting interested and potentially interested stakeholders with the CSU researchers and projects most relevant to their concerns. We are active across digital, print, and social media. Our website, <http://sustainability.colostate.edu>, includes our *HumanNature blog* with content supplied by researchers and leadership fellows. Our *digital newsletter* has 1750 subscribers and our *Facebook page* and *Twitter* have roughly 1400 followers. We sponsor, organize, and host *Public Events* (58 during 2014-2015, with about 4400 total participants), including panel discussions, lectures, film screenings, coffee socials, and author receptions, and *Invitation-Only Events*, including meetings, workshops, and dinner discussions. We also support the *CSU Student Sustainability Center (SSC)*, which works with students, student organizations, and campus staff to advance sustainability-related discussion, projects and initiatives, including the CSU Nitrogen Footprint Project and the Sustainable Futures Fair designed to help students find careers in sustainability.

Looking Ahead: We plan to maintain and refine our existing communications and engagement efforts and also add a number of new activities in the years ahead. Our top priorities are to:

1. *Enhance our provision of useful information to audiences outside of CSU.* This will include creation of “issue briefs” that highlight CSU research results and review articles and scientific assessments that address issues of importance to local, regional, and national stakeholders. We will also work to expand coverage of sustainability issues through proactive engagement with journalists and continued experimentation with video, radio and social media interaction.
2. *Refine our mix of engagement activities in order to engage a broader and more extensive set of stakeholders.* We intend to develop a periodic larger-scale symposium that will provide new opportunities for stakeholders to describe their perspectives, priorities and information needs to the CSU community, and to support development of collaborative networks that promote and enable the connection of sustainability science to public and private sector decision-makers.
3. *Research, catalogue, and maintain a database of regional private sector and non-governmental sustainability entities and activities.* We will use this information to assess needs for sustainability research and information, initiate discussions, and identify possible collaborative opportunities. We also see this information as a valuable resource in providing job placement advice to students.

Key Needs: We frequently self-evaluate the reach and effectiveness of our engagement activities and can pursue some new activities through reallocation of funding and staff time, and we have invested one-time funds in beginning to build new capabilities in this area. But fully pursuing our engagement priorities requires new resources to enable long-term support of communication, marketing, and event experts, and participation of CSU experts in assessments and reports.

SoGES Centers

SoGES hosts two interdisciplinary centers. Both grew out of smaller-scale projects supported by SoGES micro-grants, and have evolved into larger scale ongoing activities with strong interest and participation from faculty and students. Enhancing support for these centers is an important priority for SoGES and a focus of our fundraising efforts.

The Africa Center: Africa is a region of great environmental richness, rapid growth, and increasing human needs. About a quarter of the world's mammal species and a fifth of its bird species are found in Africa, and about a sixth of the world's plant species are native to the continent. Some areas appear to have increasing biodiversity, while others are experiencing rapid biodiversity loss as a consequence of agricultural cultivation, land degradation, and urbanization. The human population is increasing rapidly, with population growing by about 74% from 1990-2012. The continent has 7 of the world's 10 fastest growing national economies, but poverty and hunger are still major challenges in many regions. The Africa Center was established in 2014 to focus CSU work in these important areas. Its mission is to enhance biodiversity, advance human and animal health, empower communities, and promote environmental, economic, and social sustainability. The center provides a platform for CSU faculty and students, Fort Collins community members, and African partners to work together on research, education and engagement in Africa and links diverse types of knowledge (e.g., local, science) to identify and solve social and environmental problems. Current and future priorities include:

- Collaborative research
- Public involvement and engagement through seminars, panels, lectures, and symposia on African research community coffees, and Ale and Africa events
- Visiting Faculty
- Development of graduate certificates
- Student and postdoctoral scholarships, internships and fellowships.

The CSU Global Biodiversity Center: A large body of scientific studies show that biodiversity – the variation of all life on earth – is diminishing rapidly. The current rate of species extinction is estimated to be 1000-10,000 times higher than the average rate of extinction during the last 65 million years. Science also provides us with compelling evidence that biodiversity is a critical component of environmental sustainability. Healthy ecosystems and many of the natural resources, services, and products that are vital for human survival, such as nutritious food, clean air and water, and carbon removal and storage, depend on biodiversity. Our new biodiversity center, founded in 2015, is bringing CSU researchers together in an effort to increase appreciation of life's variation and strengthen human links to wild nature. The center aims to maintain and enhance biodiversity through research, policy advancement, education, and outreach. Its goals include:

- Acting as a forum for biodiversity issues, from the local to national to international
- Building and supporting a community of researchers and students, community members, and national/international experts in biodiversity research, conservation, and policy
- Developing new research approaches
- Providing a central node for networking and information exchange among biodiversity researchers, policy makers, managers, and the general public.