

Sustainability Research Recommendations for CSU

President's Sustainability Commission: Research Subcommittee

In order to address the challenges of sustainability meaningfully, the scientific community has called for universities and research institutions to make greater strides toward changing the research culture, particularly supporting more interdisciplinary teams, engagement, and communication with stakeholders to drive research and disseminate findings. Universities recognize that to be on the cutting edge of science they must support a wide range of research activities and promote interdisciplinary research that connects different disciplines to address complex problems, yet there are many well-documented barriers to conducting interdisciplinary research in the university setting. Below we outline these barriers and provide recommendations to address them.

Recommendation: Improving incentives, access, and programs at Colorado State University for interdisciplinary sustainability research across the entire University will significantly increase our scientific relevance and competitiveness. The Research Subcommittee of CSU's President's Sustainability Commission has compiled the following list of ideas and incentives that we feel would facilitate better and more interdisciplinary sustainability research at the University. Our goal is to recommend to the President's Office, the Provost, and the Vice President for Research a menu of ideas that we feel would be most effective at achieving these goals and accelerating CSU's progress toward addressing some of the most pressing and relevant scientific questions of our time.

SUMMARY OF RECOMMENDATIONS

Expand & Improve	Incentivize New	Excellence
<ul style="list-style-type: none">• Build on value of existing programs and internal support• Improve networking of faculty on sustainability topics; identify strengths and gaps	<ul style="list-style-type: none">• Joint postdoctoral positions• Support for proposal prep and administration• Teaming beyond CSU	<ul style="list-style-type: none">• Recognition• Encouragement for interdisciplinary work• Translation and dissemination

Barriers to interdisciplinary sustainability research are not unique to CSU, but the University is also not exempt from these. Our committee has identified significant barriers in the following areas:

Collaboration

- Networks across disciplines are lacking
- Disincentives from departments when funds for work will be shared across the University
- Intellectual barriers, including differences in methodology, language, and metrics of success. Also, the additional time it takes to overcome these differences when working together
- 'Proposal ready' period is lengthened for interdisciplinary groups that must first develop common language and ideas (*note: existing programs at CSU such as SoGES GCRTs and PRECIP awards begin to address this*)

Proposal preparation

- Distribution of proposal opportunities – some departments have dedicated staff, others do not; likewise, communication about funding opportunities for research vary greatly across departments and colleges
- The assistance available to help with preparation of proposals varies widely across departments and colleges

Early career faculty and researchers

- Real and perceived risks to undertaking interdisciplinary research (both real and perceived have the same outcome)
- Interdisciplinary research is not adequately recognized in the tenure and promotion process: departmental and college tenure and promotion codes often do not include criteria or metrics for recognizing interdisciplinary research; departmental and disciplinary cultures also tend to actively discourage interdisciplinary work
- Early career and non-tenured faculty have insufficient autonomy to pursue research agendas of interest to them
- Inter-departmental research can pull faculty time away from their departments

Departmental/fields of study/organizations

- Faculty from the social sciences and humanities are often are not included until later stages of proposals and projects – they can make greater contributions if involved in early stages, such as defining the problem (happens due to undervaluing the potential contribution of social sciences and the humanities, lack of existing networks, misunderstanding of social sciences and the humanities, etc.). Success in confronting global sustainability grand challenges will require deep understanding of human cultures and their capacity for adapting to stressors and change; social scientists and humanists will be key players in providing evidence and insight on these matters
- Existing organizations on campus can be fragmented and lack communication, which can lead to overlap and/or gaps

Applicability of research and communicating science

- Research questions are not necessarily geared toward answering the most pressing real-world sustainability problems that typically demand interdisciplinary approaches (research priorities and stakeholder needs are not always well matched, lack of channels for stakeholders to communicate questions to researchers, general disconnect)
- Scholars confront disciplinary and organizational disincentives to engage in research and outreach that is geared toward direct application to real-world problems
- Scientists often do not communicate findings to stakeholder populations (lack of incentives, lack of training or interest, scholarly publications advance science but are not geared toward or accessible for stakeholders and policy makers, etc.)
- Extension has experienced significant budget cuts and staff available do not match the public need, which is inconsistent with the land grant mission of the University

Sustainability Research Recommendations for CSU

We recognize there are many modes by which these barriers might be addressed and solutions implemented. We further recognize the extraordinary ability of CSU's leadership and staff to generate and actualize mutually constructive and strategic approaches to the University's mission, including its sustainability focus. There are a number of potential parties that could implement the below recommendations, including the Office of the President, Office of the Vice President for Research, Office of the Provost and Executive Vice President, University Advancement, various communications teams, and deans. The purpose of this document is to encourage the consideration of these recommendations, which were developed by a team of diverse faculty engaged in sustainability research across all eight colleges, when making decisions about strategy and budget. This is intended to be a "menu of ideas" that can be used as a resource.

Recommendation #1: EXPAND & IMPROVE EXISTING SUSTAINABILITY-RELATED RESEARCH

1.1 Sustain and grow the existing programs that are highly effective at encouraging interdisciplinary sustainability research at CSU.

The existing organizations including the School of Global Environmental Sustainability, the Water Center, the Energy Institute, and the Center for Collaborative Conservation allow for more flexibility in organizing interdisciplinary sustainability research and have been very effective at facilitating this work at the University. We recommend continuing, and where possible providing additional resources and support to these organizations. In an effort to reduce redundancy, we recommend increased communication between these organizations when selecting research awardees. We also recommend that where appropriate and beneficial, new and emerging initiatives and centers consider inclusion in the existing framework of these organizations rather than creating new centers on campus, as proliferation of new centers can lead to further fragmentation of interdisciplinary research.

These efforts should help provide a more cohesive and mutually supportive research environment. Tied to the University's sustainability mission, they could further motivate philanthropic matching to support the public presentation of one of the world's most prominent "green" or "sustainability" focused research universities.

1.1a Increase research funding for these programs.

1.1b Increase communication and coordination among groups to identify collaborative opportunities and minimize overlap. This goal can be implemented by these organizations themselves, and a suggested first step is a meeting of their directors hosted by SoGES and/or the PSC.

1.1c Expand seed grant opportunities that potentially feed into larger grant opportunities, i.e. CIP and PRECIP, SoGES GCRT, Water Center, CCC, etc.

1.1d Provide targeted funding to highlight collaborations between sustainability programs, promoting a recurring large-scale university level talk or symposium. CLA's Great Conversations or the 21st Century Energy Transitions Symposium theme could provide a model for the event, supplemented with a symposium of current sustainability research.

1.2 Increase efforts at the University to identify strengths, opportunities for collaboration, and create an environment for researchers and faculty to create opportunities for interdisciplinary sustainability work.

We recommend two types of programming for existing faculty. First, facilitate topical meetings for faculty from across the University that would help identify areas of common interest and collaboration, University strengths in research areas, and also help establish interdisciplinary linkages so they are already networked and poised when calls for proposals are announced. Second, develop

and support panels or symposia to exchange ideas and lessons learned from not only successful, but also unsuccessful interdisciplinary faculty groups on campus who can share challenges and keys to success when embarking on these projects. Before either of these take place, we first recommend polling faculty to better identify the research topics with greatest potential impact and to help guide and structure events.

- 1.2a* Polling or queries to faculty on what are the most pressing research topics. SoGES, OVPR, colleges, other centers could all take lead.
- 1.2b* Socials/mixers/meetings to connect faculty interested in specific topics with one another and discuss ideas. SoGES, OVPR, colleges, or other centers could take lead.
- 1.2c* Panels and symposia to discuss successful examples as well as unsuccessful attempts on campus and challenges to interdisciplinary work.
- 1.2d* Create a comprehensive campus directory of interdisciplinary sustainability programs, hosted on the CSU homepage rather than scattered in sub-pages and on green.colostate.edu. PSC could compile list to provide to CSU web team.

Recommendation #2: INCENTIVIZE & INCUBATE NEW INTERDISCIPLINARY SUSTAINABILITY-RELATED RESEARCH

2.1 Create joint postdoctoral positions.

Create a program that would encourage interdisciplinary and collegial relationships for faculty members and have an ongoing impact on their ability and enthusiasm to work together long term. The postdoc position would be shared between those faculty members/departments. Ideally this program would accept between three and five new postdocs each year for between six and ten postdocs annually. Each position would be fully funded for two years. Postdocs would form a cohort that also receives semi-regular training, meetings, networking opportunities, mentorship, and other support provided by the hosting organization. SoGES would be an obvious fit to host this program. Furthermore, this program would position postdocs to be more competitive and relevant in their fields, ready to make an impact on sustainability science and also better equipped to work on interdisciplinary projects. The program would encourage interdisciplinary and collegial relationships for faculty members and have an ongoing impact on their ability and enthusiasm to work together long after the position has ended

- 2.1a* Funding support for this program.
- 2.1b* Put out an annual competitive call for proposals where two or more faculty members from different departments and a postdoc candidate together would jointly apply for the position. We recommend funding support if available, as we feel this would be the most effective effort from this list to get faculty working together across disciplines.

2.2 Increase support for proposal preparation and administration.

Broad support mechanisms are required to overcome the structural burdens that impede interdisciplinary sustainability research proposal preparation and administration. By providing modest release, support, and messaging, new research efforts can be identified and developed. Additionally, expanding central support staff to assist with proposal dissemination and preparation, would alleviate some of the variation across departments.

- 2.2a* Teaching release for proposal preparation and for serving as PI for large/complex grants with an explicit sustainability focus.
- 2.2b* Increased messaging about opportunities from central university, someone to aggregate sustainability-related grant opportunities and send to all departments on campus.
- 2.2c* Expand support staff available to help coordinate large proposals

2.3 Encourage teaming that goes beyond individual universities and traditional partnerships.

Opportunities exist for faculty to collaborate on research with researchers from other universities, government, and non-governmental institutions, but it can be difficult to find time and resources to work on these projects. In some cases, funding exists, but would require use of sabbatical leave in order for faculty to engage with such projects meaningfully. If there were more streamlined mechanisms for faculty to collaborate across institutions and organizations, CSU would likely see an increase in meaningful, high-impact research by its faculty.

- 2.3a* Create course buyouts, internships, or other departmental arrangements for faculty to work on inter-organizational teams that do not require use of personal time.
- 2.3b* Identify internal and external modes of funding support for departments to offer these alternative arrangements so the financial burden is not at the departmental level.

Recommendation #3: RECOGNITION AND DISSEMINATION OF SUSTAINABILITY-RELATED RESEARCH

3.1 Increase departmental and college-level incentives and support for interdisciplinary work.

While all of the goals in this document seek to address academic culture change around interdisciplinary sustainability research, we wanted to be sure it is called out as a goal for CSU in and of itself as well. Sustainability research awards would acknowledge interdisciplinary sustainability work, while also helping to elevate that work and mitigate some of the disincentives that exist. These awards would be peer-reviewed, and ideally made very high profile at the University to help give merit and acknowledgement for this type of research. The award should come from the President's Office.

- 3.1a* Create a large scale, University-level award for interdisciplinary sustainability research in two categories: one for all research, and one for early career to help incentivize and provide recognition for interdisciplinary work to young faculty. This would require a jury of faculty to peer review and President's office to give award.
- 3.1b* Generate and implement guidelines for including interdisciplinary sustainability research as a notable achievement in the tenure and promotion process.

3.2 Increase resources and staff available to help translate and disseminate science; and available to gather feedback and stimulate future research questions.

To truly have an impact on global grand challenges, researchers need to ask research questions that are applicable and relevant to real-world issues and also disseminate findings to stakeholders and decision-makers. There are few incentives for researchers to do either, likewise researchers often lack the tools and skills to communicate their findings to external audiences. Our committee recommends an increase in science communication staff at CSU who are available to translate findings for non-academic audiences, help communicate results, and also gather stakeholder feedback to stimulate future research objectives. Our recommendation is to invest more University resources into science promotion teams, which would consist of science communication experts and social scientists working in community-based or participatory methods, able to work closely with faculty to understand their science and possess the technological knowledge to help disseminate information. This goal aligns with CSU's land grant mission, and calls for a re-envisioning of how the University approaches extension and media communication to address dissemination of science. While current efforts are to be lauded, further efforts are warranted.

- 3.2a* Direct resources to hiring more communications staff that work *across* colleges.
- 3.2b* Re-envision the role of college-level communicators and provide training for existing communications teams to expand their role and engagement with sustainability research, so as to provide substantive feedback to the research community regarding the questions such research inspires in the public realm.

- 3.2c Training in science communication for CSU faculty that have the desire and interest to increase their own skillset. This could be built from the SoGES Sustainability Leadership Fellow program if resources were available.
- 3.2d Generate a more unified and coordinated communication strategy for the University to highlight sustainability research. A “sustainability research today” release as a standard part of the weekly SOURCE release would be a good starting point.

Research Subcommittee Members

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Aleta Weller (chair)	School of Global Environmental Sustainability	
Ruth Alexander	History	Liberal Arts
Ann Bohm-Small	Office of the Vice President for Research	
Thomas Borch	Soil and Crop Sciences	Agricultural Sciences
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