The Center for Science, Technology, and Environmental Policy Studies (CSTEPS) serves as an international interdisciplinary focal point for policy and management research. Team-based projects join faculty, postdoctoral researchers, students and stakeholders and use multiple methods to generate solutions to some of the world’s most pressing challenges at the nexus of scientific, societal, technological and environmental change.

Much of our work is global, with several projects either located in other countries or focused on global trends and issues. CSTEPS is a member of a growing global network of science and environment policy organizations that collaborate on research in core project areas including global regulation and governance, adaptation to climate change, international development and science policy.

Located in the School of Public Affairs in downtown Phoenix at Arizona State University, CSTEPS is dedicated to training a new generation of interdisciplinary social scientists committed to producing policy-relevant empirical research.

CSTEPS team members (from left to right: Leonor Camarena, PhD student; Eric Welch, Center Director; Heyjie Jung, PhD student; and Suyang Yu, PhD student, show school spirit and share research at an ASU Watts College of Public Service and Community Solutions event.)
In academic year (AY) 2018-2019,

CSTEPS continued work on a diverse portfolio of policy-relevant empirical research initiatives at the nexus of global scientific, technological and environmental change.

Over the past year, CSTEPS produced:

+16 Peer-reviewed publications
+18 Working and under-review papers
+15 Proposals submitted
+20 Conference papers and invited talks
A primary goal of CSTEPS is to use applied research to train, mentor, support and guide graduate students toward independent research careers.

In AY 2018-2019, CSTEPS students continued to excel in research and scholarship, with highlights including:

- 2 Completed dissertations
- 2 Hired for tenure-track Assistant Professor positions
- 3 Courses taught
- 6 Data collection projects
- 10 Awards and merit scholarships
- 15 Presentations at national and international events

PhD student Fengxiu Zhang presents her research on public transit agencies and extreme weather events.
CSTEPS faculty and students received numerous recognition and awards in AY 2018-2019:

Dr. Mary Feeney (CSTEPS Associate Director) and Fengxiu Zhang (PhD Student): Honorable Mention, William E. Mosher and Frederick C. Mosher Public Administration Review Best Paper Award

Dr. Federica Fusi (CSTEPS PhD Graduate, Dec. 2018): ASU School of Public Affairs Teaching Award; Assistant Professor at University of Illinois-Chicago

Dr. Eric van Holm (CSTEPS Postdoctoral Scholar 2017-2019): Assistant Professor, University of New Orleans

Heyjie Jung (CSTEPS PhD Student 2017-present): Best Poster Award – 2nd place (2018), Conference on Governance of Emerging Technologies & Science

Fengxiu Zhang (CSTEPS PhD student 2015-present):
- Digital Governance Junior Scholar 2019, Section on Science & Technology in Government (SSTIG), American Society of Public Administration (ASPA)
- Best Student Paper 2019, Section on Transportation Policy and Transportation (STPA), American Society of Public Administration (ASPA)
- Outstanding Doctoral Student 2018-2019, School of Public Affairs, ASU
- Dissertation Completion Fellowship 2019 Spring, Graduate College, ASU

PhD student, Leonor Camarena presents research on gender and leadership in the non-profit sector.
Transportation Projects

CSTEPS was involved in two transportation related projects in AY 2018-2019. The Transit and Extreme Weather project examines how transit agencies experience, perceive, prepare for and respond to risks associated with extreme weather events. CSTEPS is now conducting the 2nd wave of a national survey on transit agencies, following the first wave in 2016. This project collects data from approximately 1,000 top managers from the 312 largest fixed-route public transit agencies in U.S. metropolitan areas. This project was initially funded by the Federal Transit Administration, DOT. CSTEPS received a Watts College Center Alignment Grant for a collaborative pilot project with the Center for Spatial Reasoning and Policy Analytics to investigate the vulnerability of transportation systems to extreme weather. With a special focus on the interstate highway systems in the Southwest region, the pilot project combines data on the transportation system, daily average traffic, extreme weather events and community facilities to identify and visualize weather-induced vulnerability hotspots on a geodesign platform.

In April 2019, the team conducted an interactive workshop with a group of emergency managers and transportation managers at the Arizona Department of Emergency Management and Military Affairs, and gathered feedback about the usefulness and possible improvement to the platform. The next steps are to identify and apply for future funding sources to modify and expand the platform into real-world applications to facilitate multi-stakeholder decision-making and governance.

Dissertation:
Zhang, Fengxiu, Public Organization Adaptation to Extreme Events: Evidence from the Public Transit Sector, Defending Fall 2019.

Peer-reviewed publications:


Under review and conference papers:


Longitudinal Study on Technology Use in Government

In AY 2018-2019, CSTEPS conducted the 5th round of our biennial survey of Technology Use in Local Governments. This research collects data on technology use from a sampling frame of 2,500 managers in 500 city governments across the US. The project includes more than 20 collaborators and has produced more than 30 peer-reviewed publications as well as multiple dissertations and policy reports for medium and small cities across the US.

Dissertation

Peer-reviewed publications


Under review
1. Zhang, F., Stritch, J. and Welch, Eric W., Does Organizational Response Capacity Reduce Political Oversight and Participative Governance?


Conference papers

Connecting Nuances of Foreign Status, Professional Networks and Higher Education, National Science Foundation, DGE #1661206, PI 2017-2020.

In collaboration with Georgia Institute of Technology and the University of Arkansas, this project studies the global scientific workforce's changing experiences and characteristics, as well as promotes a more comprehensive theoretical and empirical approach to characterizing international background and experience moves beyond a dichotomous understanding of foreign and native born. In two years, the project has produced 4 published manuscripts and 13 papers under review or in preparation. In addition, the team was interviewed by international media about the project, and we have organized panels at national and international conferences related to the research.

Peer-reviewed publications

Under review
2. van Holm, E, Jung, H, Welch, E. The Impacts of Foreignness and Cultural Distance on Commercialization of Patents, R&R Journal of Technology Transfer.
3. van Holm, Eric, Urban Predictors of Foreign-Born PhD Clusters.

Conferences and working papers
Contested Resource Inputs to Science: How Institutional Provisions on the Access and Use of Materials and Data Affect Research Collaboration Structures and Outcomes. NSF #1360166

This study collected new data from scientists in the United States to understand how international, national and university rules and regulations on biological material inputs to science affect scientific collaboration behavior, collaboration networks and science production. The study is timely because the number of national and international regulations on biological materials is increasing, reducing scientists’ direct control over biological material inputs to research and creating a more complex regulatory environment for scientists to navigate. These regulations have been established for justifiable reasons. For example, the Nagoya and Cartagena Protocols of the Convention on Biological Diversity regulate the global exchange and use of biological materials in research for equity and safety reasons.

This research has provided new data and analysis that provides empirical evidence that inform policy design and implementation and helps the science community manage biological inputs to research to maintain high quality science and effectively respond to policy demands. Results from this project have informed numerous policy makers in the United States and in other countries about the effects of regulation on science. For example, this research has been disseminated across policy-making bodies such as the US Agency for International Development, US National Institutes of Health, the US State Department and the United Nations Food and Agriculture Organization and new research has been commissioned to further investigate the effects of regulation on science. Policy processes, policy negotiation positions and research programs have been revised to reduce constraints placed on science collaboration. This project supported two PhD students, one woman and one man, who received extensive research training, produced several manuscripts and participated in translating research findings to policy makers.

Peer-reviewed publications

Under review and working papers
1. Welch, EW, Taggert, G, Feeney, MK, Siciliano, M, Navigating the labyrinth: Academic scientists' responses to new regulatory controls on biological material inputs to research.
2. Fusi, F., Welch EW and Louafi, S. A Theoretical Perspective on Social Capital to Sustain Open Communities.
4. Feeney, M, Welch EW, Siciliano M. Contested resource inputs to science: How institutional provisions on the access and use of materials and data affect research collaboration structures.

New funding awarded based in part on the research and findings from this NSF funded project:
1. Implications of Advanced Sequencing and Synthetic Biology for the International Treaty on Plant Genetic Resources (ITPGRFA). Funded by the United Nations Food and Agriculture Organization, 2017, EW Welch (Primary Investigator).
2. Potential and emerging impacts of the changing institutional landscape on the global exchange of genetic resources for food and agriculture (GRFA), Bureau for Food Security (BFS), United States Agency for International Development (USAID), 2015-2017, EW Welch (Primary Investigator).
4. Institutional and Organizational Factors for Enabling Data Access, Exchange and Use Aims for DivSeek, United Nations Food and Agriculture Organizations (UNFAO), 2015-2016, EW Welch, PI

The purpose of this study is to identify and examine factors relevant to national research competitiveness within the U.S. context. CSTEPS, in collaboration with Georgia Institute of Technology, has developed a literature based theoretical framework for academic research excellence and competitiveness that includes four levels or units of analysis: ecosystem, institutional, project, and individual; and five elements: resource acquisition, knowledge production, attractiveness, visibility/reputation, and economic development. We have also converted this framework to a full set of logic models for evaluation purposes. AREC is a nested framework such that elements at one level of AREC can be influenced by elements at other levels. CSTEPS, in collaboration with 2M, Abt Associate and Georgia Tech, is also beginning to test the framework with available extant data. Over the next year, CSTEPS will work with other partners to use National Science Foundation internal data to test dimensions of the framework.

Science and Engineering Workforce Panel Opinion Survey (SciOPS), Establish a panel study of scientists, engineers and technology innovators that can rapidly provide high-quality survey data on important science policy and society topics, ASU sponsored, PI, 2016-2019.

SciOPS is an interactive web-based platform designed to address the current lack of sustained, timely, policy relevant, unbiased and empirical information from science, technology and innovation (STI) professionals. The driving goal of this project is to connect the STI community with a variety of stakeholders in a way that is accessible and keeps up with the increasingly rapid pace of information dissemination, while still maintaining accuracy, transparency and integrity of the content. SciOPS is designed to provide unbiased information for real-world solutions including: informed policy decisions, accurate science and technology reporting, expert insights for industry innovators and their investors, and improved knowledge about STI community perspectives for the general public.

CSTEPS, in collaboration with expert partners in journalism, survey design and web user experience, is building a platform where a world-class panel of scientists, engineers and technology innovators, would rapidly provide high-quality expertise on important science policy and society topics. Through regular surveys of subsets of the panel, we will investigate what the STI community thinks about relevant topics, either in response to policy crises, events or consumer needs. The results of these surveys would then be displayed via online interface in an accessible, relevant manner, so that users could interact with the information in a variety of ways --- from developing news stories, and new product design or as a starting point for more in-depth research.

CSTEPS has filed an invention disclosure and is applying for a patent for this project and will soon complete panel design. Panel recruitment will be initiated and web development will be completed in summer 2019. A pilot version of the SciOPS platform is set to launch in spring 2020 and CSTEPS anticipates to secure long-term funding to scale impact.

CSTEPS focuses on empirical research for real-world solutions.
Much of the Center's work is collaborative and many of our projects are made possible through support from our global network of partners and sponsors.