

Data-Enabled Agricultural Resilience Panel, April 21



University of Arizona Panelists:

George Frisvold

Bartley P. Cardon Chair of Agribusiness Economics and Policy
Extension Specialist
<https://economics.arizona.edu/person/george-frisvold>

George Frisvold joined the faculty at the University of Arizona in 1997. He has been a visiting scholar at the National Institute of Rural Development in Hyderabad, India, a lecturer at The Johns Hopkins University, and Chief of the Resource and Environmental Policy Branch of USDA's Economic Research Service.

His research interests include domestic and international environmental policy, as well as the causes and consequences of technological change in agriculture. In 1995 and 1996, Dr. Frisvold served as a senior economist for the President's Council of Economic Advisers with responsibility for agricultural, natural resource, and international trade issues. He is currently an associate editor for two journals: Pest Management Science and Water Economics and Policy. In 2020, Dr. Frisvold co-authored the National Academies of Science, Engineering, & Medicine report, Safeguarding the Bioeconomy: Finding Strategies for Understanding, Evaluating, and Protecting the Bioeconomy while Sustaining Innovation and Growth.

Duke Pauli

Assistant Professor, School of Plant Sciences

<https://cals.arizona.edu/spls/content/duke>

The long-term goals of Duke Pauli's research program are to understand and utilize the genetic and functional phenotypic variation present in plant populations to responsibly address the challenges facing a growing global population including food and fiber security. The research program is composed of three separate but synergistic areas that combine to elucidate the genetic mechanisms responsible for key agronomic, quality, and stress-adaptive traits that are critical to crop production in areas prone to intense abiotic stress pressures. The first area is centered on identifying and characterizing existing genomic variation in plant populations to better understand the dynamics of phenotypic diversity. The second area concentrates on using emerging high-throughput phenotyping (HTP) technologies to quantify and record complex phenotypes that are responsive to environmental fluctuations throughout the plant's life cycle in order to understand temporal trait expression patterns. The final area is focused on discovering allelic variants and causative genes responsible for observed phenotypic variation through the use of genetic mapping populations and statistical methods. Together, his research program's findings are used to more efficiently develop improved crop cultivars that are capable of meeting the socioeconomic demands and environmental constraints of the future.

Eric H Lyons

Associate Professor - School of Plant Sciences, BIO5 Institute, Agricultural and Biosystems Engineering, CyVerse, College of Agriculture and Life Sciences, School of Information
<https://cals.arizona.edu/spls/content/eric>

Dr. Lyons is an associate professor in the school of Plant Sciences at the University of Arizona. His research focuses on scalable computational systems and infrastructure to support and accelerate life science research. To support this, Dr. Lyons is lead PI on CyVerse, a \$115M project funded by the National Science Foundation to provide cyberinfrastructure for life science research. He also developed and maintained the comparative genomics platform, CoGe, which currently manages 52,000 genomes from 21,000 organisms. He has authored over 100 peer reviewed articles and book chapters and teaches students how to use large-scale computing to solve problems and answer questions in biology. These publications encompass topics across genomics, bioinformatics, computer science, plant biology, microbial biology, malaria research, mammalian and avian research, and astronomy. Dr. Lyons serves on several boards of non-profit companies and research institutions, has worked in biotech, pharma, and software companies around the SF Bay Area, and has served as a Program Director at the National Science Foundation in the Plant Genome Research Program. He earned his bachelor's, master's, and PhD from UC Berkeley in Immunology, Microbial Biology, and Plant Biology, respectively. He also founded two companies: one non-profit and one for-profit.

Stephanie Russo Carroll

Assistant Professor, Mel and Enid Zuckerman College of Public Health and American Indian Studies Graduate Program
Affiliate Faculty, College of Law

Acting Director and Assistant Research Professor, Udall Center for Studies in Public Policy
Associate Director, Native Nations Institute, Udall Center
Director, Collaboratory for Indigenous Data Governance
<https://publichealth.arizona.edu/directory/stephanie-russo-carroll>

Dr. Stephanie Russo Carroll is Dene/Ahtna, a citizen of the Native Village of Kluti-Kaah in Alaska, and of Sicilian-descent. Her research explores the links between Indigenous governance, data, the environment, and community wellness. Her interdisciplinary lab group, the Collaboratory for Indigenous Data Governance, develops research, policy, and practice innovations for Indigenous data sovereignty. Indigenous data sovereignty draws on the UN Declaration on the Rights of Indigenous Peoples that reaffirms the rights of Indigenous nations to control data about their peoples, lands, and resources.

The lab's research, teaching, and engagement seek to transform institutional governance and ethics for Indigenous control of Indigenous data, particularly within open science, open data, and big data contexts. The lab primarily collaborates with Indigenous Peoples and nations in the US Southwest and the Arctic, as well as an international network of Indigenous data sovereignty and governance experts. Lab members also often partner with communities to which they belong, including Indigenous communities. Dr. Carroll offers Indigenous women-led mentoring of undergraduate through postdoctoral scholars and research staff with the goal of producing policy-relevant research through skill and knowledge acquisition. The lab's disciplinary breadth includes public health, law, business, geography, sociology, social work, public policy, and environmental and climate sciences.

Dr. Carroll co-edited the book *Indigenous Data Sovereignty and Policy* and led the publication of the CARE Principles for Indigenous Data Governance. She co-founded the US Indigenous Data Sovereignty Network and co-founded and chairs the Global Indigenous Data Alliance (GIDA) and the International Indigenous Data Sovereignty Interest Group at the Research Data Alliance. She chairs the Indigenous Data Working Group for the IEEE P2890 Recommended Practice for Provenance of Indigenous Peoples' Data. Dr. Carroll is an ENRICH: Equity for Indigenous Research and Innovation Coordinating Hub Global Chair. She was also a founding member of the UA's American Indian and Indigenous Health Alliance Club at the College of Public Health and the UA Native Faculty, working to support the recruitment and retention of Indigenous students and faculty at the university. She is a founding board member for the Copper River Tribal College in Chitina, Alaska. She received her AB from Cornell University and MPH and DrPH from the UA's College of Public Health.

Nirav Merchant

Director, Data Science Institute
Co-PI, CyVerse

<https://datascience.arizona.edu/person/nirav-merchant>

Nirav Merchant is the Co-PI for NSF [CyVerse](#), a national-scale cyberinfrastructure for life sciences, and NSF [Jetstream](#), the first user-friendly, scalable cloud environment for NSF XSEDE. He leads the cyberinfrastructure team for the NSF & USDA-funded National Artificial Intelligence Institute for Resilient Agriculture ([AIIRA](#)).

He received his undergraduate degree in industrial engineering from the University of Pune, India, and graduate degree in systems and industrial engineering from the University of Arizona (1994).

Over the last two decades his research has been directed towards developing scalable computational platforms for supporting open science and open innovation, with an emphasis on improving research productivity for geographically distributed interdisciplinary teams.

His interests include data science literacy, large-scale data management platforms, data delivery technologies, managed sensor and mobile platforms for health interventions, workforce development, and project-based learning.

Tyson Swetnam

Assistant Research Professor, Geoinformatics, BIO5 Institute

<https://nature.arizona.edu/tyson-swetnam>

Dr. Swetnam's research involves the applied use of cyberinfrastructure for spatial analysis in the earth and life sciences. His collaborative research portfolio spans dendrochronology, dendroecology, disturbance and landscape ecology, ecohydrology, geographic information systems, geoinformatics, geomorphology, natural resource management, plant sciences, and remote sensing. He is currently co-principal investigator (CoPI) and lead data scientist for geoinformatics with CyVerse. He is currently PI and CoPI on seven NSF and USDA awards which leverage CyVerse. Dr. Swetnam holds a joint appointment in the School of Natural Resources and the Environment, where he originally received a M.S. and Ph.D. in Watershed Management.

Channah Rock

Professor and Water Quality Specialist, Cooperative Extension, Department of Environmental Science

<https://environmentalscience.cals.arizona.edu/person/channah-rock>

Dr. Channah Rock's research-driven Extension program focuses on the intersection of water conservation and sustainability, food safety and public health protection. She was recently named Endowed Chair in Extension, Fresh Produce Safety by the College of Agriculture and Life Sciences.

Dr. Rock is PI on several projects relating to microbiological evaluation of water quality for the protection of public health. She leads a multi-year longitudinal study in collaboration with the Food and Drug Administration's Center for Food Safety and Applied Nutrition evaluating

growing practices and environmental impacts across the Southwest growing region on food safety, sustainability, and human health. Dr. Rock supports the California and Arizona Leafy Greens Marketing Agreements' by providing science-based recommendations for agricultural water treatment and promotes the use of "Direct Potable Reuse" as a safe and sustainable supply for water stressed regions. She holds a BS in microbiology from New Mexico State University and an MS and PhD in environmental engineering from Arizona State University.