# Exploring a Dynamic Soil Information System: A Workshop

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Board on Agriculture and Natural Resources
Board on International Scientific Organizations
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**VIRTUAL WORKSHOP**

# Committee Biographies

## Bruno Basso (Chair)

Dr. Bruno Basso is a University Foundation Professor in the Department of Earth and Environmental Sciences, and W.K. Kellogg Biological Station at Michigan State University. He is an internationally recognized agroecosystem scientist and leader in developing geospatial soil-plant-landscape modeling systems with primary research focused on the impact of the interactions between soil, plants, climate and management on water and nutrient fluxes and crop yields at different spatial and temporal scales. His recent research integrates AI and big-data analytics from different sensors with crop models to understand dynamic changes in soil properties, nutrient losses, and long-term sustainability of agricultural systems. He is a Fellow of the American Society of Agronomy, Soil Science Society of America and the recipient of several awards given by scientific societies and the recipient of the 2019 Outstanding Faculty Award at Michigan State University and 2016 MSU Innovation of the Year Award for Precision Agricultural Systems Analysis Software. He obtained his Ph.D. from Michigan State University.

## Ranveer Chandra

Ranveer Chandra is the Chief Scientist at Microsoft Azure Global and Partner Researcher at Microsoft Research. Dr. Chandra started the FarmBeats project at Microsoft in 2015, which aims to enable data-driven farming by getting data from the farm to the cloud in conditions with no power or Internet connectivity by using low-cost sensors, drones, and vision and machine learning algorithms. He also leads the battery research project and the white space networking project at Microsoft Research. He has been invited to present his research on FarmBeats to the Secretary of Agriculture, and TV White Spaces to the FCC Chairman. Dr. Chandra has published over 90 research papers and has over 100 patents that have been granted by the U.S. Patent and Trademark Office. He has won several awards, including the MIT Technology Review's Top Innovators Under 35. Dr. Chandra has a Ph.D. in computer science from Cornell University.

## Alison Marklein

Alison Marklein is a quantitative biogeochemist who focuses on the effects of soil chemistry, climate change, and agricultural management on soil carbon storage and plant growth. Her past research has focused on how interactions between nitrogen and phosphorus affect terrestrial carbon sequestration and the dynamics of plants and microbes. She is currently a project scientist at the University of California, Riverside, and previously worked as a postdoc at Lawrence Berkeley National Laboratory, the University of California, Davis, and the University of Montana. She received her B.A. in computational biology from Cornell University in 2008 and her Ph.D. in ecology from the University of California, Davis, in 2014. In addition to her research, Dr. Marklein is a science advisor in The ClimateMusic Project, an organization

that translates climate data into music to inspire action and hope. Dr. Marklein also works on Diversity, Equity, Inclusion and Justice in science as a member of the leadership board of 500 Women Scientists.

### Charles W. Rice

Dr. Charles W. Rice is a University Distinguished Professor of soil microbiology in the Department of Agronomy at Kansas State University. He conducts long-term research on soil organic dynamics, nitrogen transformations and microbial ecology. Recently, his research has focused on soil and global climate change including carbon and nitrogen emissions in agricultural and grassland ecosystems and soil carbon sequestration and its potential benefits to the ecosystem. Dr. Rice has also served in numerous capacities with the Soil Science Society of America. He currently is chair of the National Academies' Board on Agriculture and Natural Resources and has previously served on the National Academies' U.S. National Soil Science Committee and the U.S. Department of Agriculture's Agricultural Air Quality Task Force. Internationally, he served on the UN Intergovernmental Panel on Climate Change to author the Fourth Assessment Report, Climate Change 2007, and was among the scientists recognized when that work won a Nobel Peace Prize in 2007. Dr. Rice holds a B.S. degree from Northern Illinois University and a Ph.D. from the University of Kentucky. He joined the Kansas State faculty in 1988, becoming associate professor in 1993 and professor in 1998.

### James M. Tiedje

Dr. James Tiedje is University Distinguished Professor of Microbiology and Molecular Genetics and of Plant, Soil and Microbial Sciences and is Director of the Center for Microbial Ecology at Michigan State University. His research focuses on microbial ecology, physiology and diversity, especially regarding the nitrogen cycle, biodegradation of environmental pollutants and use of molecular methods to understand microbial community structure and function. His group has discovered several microbes that biodegrade chlorinated pollutants and is using genomics to better understand microbial functions in their environment. He has served as Editor-in-Chief of Applied and Environmental Microbiology and Editor of Microbial and Molecular Biology Reviews. He has over 500 refereed publications, including seven in Science and Nature. He shared the 1992 Finley Prize from UNESCO for research contributions in microbiology of international significance, is Fellow of the American Association for the Advancement of Science, the American Academy of Microbiology, and the Soil Science Society of America, and is a member of the National Academy of Sciences. He served as president of the American Society for Microbiology and the International Society for Microbial Ecology. He received his B.S. degree from Iowa State University and his M.S. and Ph.D. degrees from Cornell University.

### Kathe Todd-Brown

Dr. Kathe Todd-Brown, an assistant professor at the University of Florida, is a computational biogeochemist who uses mathematics and computers to understand how soil breathes. By using data from multiple worldwide studies and simplifying or expanding the complexity of soil models to interoperate that data, she strives to give society a better understanding of this critical climate response. She is passionate about data and open reproducible science. Through her work with the International Soil

Carbon Network, she is working with collaborators across the globe to address harmonization issues in soils. She has been a postdoctoral fellow (2019) with Drs. Jennifer Baltzer (Wilfred Laurier University) and Merriett Turetsky (Guelph University), a Distinguished Linus Pauling Postdoctoral Fellow at the Pacific Northwest National Laboratory, a postdoctoral research fellow at the U.S. Department of Energy laboratory in Richland, Washington (2015-2018), and a postdoctoral researcher at the University of Oklahoma (2014). She received her Ph.D. (2013) from the University of California, Irvine, from the Earth System Science Department. She holds a Bachelor of Science (2004) from Harvey Mudd College in Claremont, California, in mathematics and has worked as a software developer for bioinformatics tools at Massachusetts General Hospital in Boston, Massachusetts.

### Rodrigo Vargas

Rodrigo Vargas is an Associate Professor at the Department of Plant and Soil Sciences at the University of Delaware. He spent over 2 years working as an Assistant Professor at CICESE, a top national research center in Ensenada, Mexico. He completed his Ph.D. at the University of California, Riverside, and a postdoc at the University of California, Berkeley. His research interests focus on how biophysical factors regulate carbon and water dynamics in terrestrial ecosystems. He studies soil–plant–atmosphere interactions to understand and quantify the response of terrestrial ecosystems to management, extreme weather events (e.g., hurricanes), and global change. His research spans from soil ecology to micrometeorological measurements of water and carbon fluxes at multiple spatio-temporal scales and vegetation types. He is a member of the U.S. national committee for soil sciences of the National Academies of Sciences, Engineering and Medicine.