

## EEE Research Seminar

Date: December 6, 2022 at 10:30 AM

Location via Zoom: <https://purdue-edu.zoom.us/j/96791547896?pwd=eUpoYkFPeDZZQXh2aDM1RlRMeV05Zz09>

### Dave Zelinka, PhD

Climate Data Specialist and ESG  
Consultant

Optera



## A decade of transdisciplinary work: addressing complex problems by merging engineering, the social sciences, and systems thinking

### Abstract

I discuss my path from environmental and ecological engineering to where I am today, focusing on major interdisciplinary & transdisciplinary projects and career developments with an emphasis on complex systems thinking. The presentation opens with my EEE senior capstone in eWaste recycling and moves into my master's thesis on the comparative environmental impact life-cycle analysis of hydraulic fracturing. Starting my PhD, I am fully down the rabbit hole of applied complex systems and transdisciplinary research with a smorgasbord of topics, disciplines, and issues that must somehow be crammed into a single nontraditional dissertation. My postdoctoral work sees me back into climate and environmental areas by focusing on power plant-level emissions of the global electricity sector, during which COVID happened. I then moved away from a solely research-based career, having formed a very small consulting company to continue my work in political corruption and peacebuilding – started during my PhD – with the United States Institute of Peace and the Santa Fe Institute. As a consultant and climate data specialist with Optera, I continue my path back to environmental and climate issues and leverage a decade in research & academia for a professional career. Interspersed throughout my journey, the presentation occasionally sidesteps into the major forthcoming concepts, ideas, and fields on which the projects are based, like defining transdisciplinary research, systems thinking, & others.

### Bio

Dave attained a Ph.D. in civil systems engineering and a second M.S. in global engineering from the Mortenson Center for Global Engineering in the Department of Civil, Environmental, and Architectural Engineering at the University of Colorado, Boulder (2019). He holds his first M.S. in environmental & sustainability engineering from the University of Colorado, Denver (2016) and a B.S. in environmental & ecological engineering at Purdue University, from which he was part of the first graduating class of 2013. Dave is currently a climate data specialist & ESG consultant at Optera, a Boulder-based software & consulting firm that works with corporations to calculate & analyze their scope 1, 2, & 3 greenhouse gas emissions and advises them in emissions reductions pathways per the Science-Based Target's Initiative (SBTi). As a climate data specialist, he maintains the emission factors database, GHG calculation methodologies, & models used across Optera. He creates various processes and systems to streamline company operations & workflows to improve cohesion among the engineering, product, & services teams. He is the founder of Civitas Systems, a research consulting company merging systems thinking, peacebuilding, and data science to solve problems in complex human systems — turning his passion into a life-long career. He has worked with the United States Institute of Peace (USIP), the Santa Fe Institute (SFI), and on research collaborations with international colleagues on various projects in Israel-Palestine, Burkina Faso, Niger, Bosnia-Herzegovina, & Central Asia.