

It is my distinct honor to introduce Dr. Sam Zipper, who is receiving the 2022 Kohout Early Career Award given by the Hydrogeology Division of GSA. He is being recognized for his *scientific advances in understanding the hydroecology of anthropogenic landscapes* to enable more sustainable management of land and water resources. I can think of no other scientist with a loftier research mission who has made more progress during the early stages of their career than Sam. Dr. Zipper's research transcends disciplinary boundaries, using a range of field methods, numerical modeling, analytical and statistical techniques and social science to address societally relevant grand challenges. Specifically, his research focuses on investigating how feedbacks between groundwater and land use, cover, and management decisions impact water, ecosystems, and society.

Dr Zipper's research has revealed underappreciated controls on hydrologic fluxes and ecosystem productivity across a range of ecosystems within our human-dominated landscape. His research has taken him to corn fields to quantify the role of shallow groundwater in creating resilience to drought at the subfield scale. Sam's characterization of the two-way relationship between water table depth and crop yield has important implications for precision agriculture using irrigation and/or managed tile drainage, and will be useful in helping to close the yield gap to feed a growing global population. Sam has worked in cities, in the growing field of urban ecohydrology, using a dense network of temperature/relative humidity sensors in conjunction with satellite imagery to quantify the impacts of the urban heat island on growing season length and evapotranspirative demand. He has documented a substantial increase in evapotranspirative demand caused by warmer temperatures in the urban core, which has significant implications for predicting increased rates of water use and water stress in urban forests created by this excess water demand. Sam has found himself in streams of the western US, developing tools for quantifying streamflow depletion, improving continental-scale estimates of streamflow depletion, and communicating these findings through novel visualization tools and open-source software.

Sam's hydrogeological advances related to groundwater and land use, cover, and management, have led to interdisciplinary, collaborative efforts linking groundwater hydrology to other aspects of the earth system and society. These efforts have been broad, including linking well installation data to policy document analysis and crop productivity to evaluate societal learning in response to drought; quantifying the economic impact of shifts from irrigated to dryland agriculture due to groundwater depletion; and proposing a framework to link local water management practices with Earth System stability. Developing these quantitative and methodological ties between hydrogeology and other disciplines has allowed Sam's work to have a substantial impact outside the groundwater and geological communities, bringing rigorous groundwater science into conversations where it likely would have otherwise been absent.

Predicting the future is always fraught with uncertainty, and we can't know the path a scientist will forge over the coming decades. However, in the case of Dr. Zipper, I don't see how you could expect anything but great results when you combine his capability to seamlessly integrate diverse field, analytic, remote sensing and numerical modeling techniques; his ability to collaborate meaningfully across physical, biological and social sciences; and his unwavering commitment to tackling societally relevant issues that truly matter. For these reasons, I can think of no one more deserving of the Kohout Early Career Award, and I look forward to the future becoming the past so that I can marvel at Sam Zipper's contributions to our discipline and to society.