

Beadling helps launch framework to evaluate climate models

by Greg Fornia

Assistant Professor Rebecca Beadling is a member of the Climate Model Benchmarking Task Team that designed and delivered the Rapid Evaluation Framework (REF), an open-access tool that dramatically speeds up the evaluation of climate models. Launched by an international team of scientists in 2026, the tool allows researchers to compare model results with real-world observations, providing immediate insight into model performance.

REF was developed by scientists working on the Coupled Model Intercomparison Project (CMIP), a global collaboration that provides the framework for large-scale climate model comparison by coordinating a common set of experiments for modeling centers to run, defining standards for data requirements, and providing the technical infrastructure for the public release of model results. CMIP results provide the backbone for the assessment of future climate change in the Intergovernmental Panel on Climate Change Assessment Reports (IPCC).

"Over the past two years, I've contributed to the design of the dashboard and the ocean metrics," explained Beadling. "There is still much further to go, but the community release of the first version of the REF, designed to aid model assessment for the upcoming IPCC-AR7, represents a significant advancement toward the ability to rapidly assess how well the new generation of climate models perform relative to the observed world. The tool is open and freely available, broadening access to evaluation tools and model results."

The REF makes it much faster and easier to assess how well these climate models perform by automatically comparing their outputs against real-world observations. Until now, evaluating climate models could take months and require downloading terabytes of data. For specific climate variables relevant for policy makers, the REF automates much of the process, running checks across a wide range of measurements and producing results that are available online for anyone to access.

"The faster we can assess the strengths and weaknesses of climate simulations," said Beadling, "the faster we can improve models and provide reliable projections of future climate change for the public and decision makers."

EES WELCOMES DAVID LITWIN

With expertise in hydrology and landscape dynamics, David Litwin has joined the EES Department as assistant professor.

Prior to Temple, Litwin served as a postdoctoral researcher at the GFZ Helmholtz Centre for Geosciences in Germany, where he investigated Earth surface processes and landscape evolution. His research focuses on landscape hydrology, examining how topography and water flow interact to shape landscapes over time. He earned his PhD in Geography and Environmental Engineering from Johns Hopkins University, concentrating on landscape hydrology.

Litwin studies how water moves through and affects Earth's critical zone (CZ), which extends from the bottom of the circulating groundwater to the top of the vegetation canopy. His work combines theory, numerical simulations, and field measurements to improve our understanding of fundamental processes and management of the CZ, considering both modern environmental change and long-term evolution.

BUYNEVICH NAMED GSA FELLOW

by Greg Fornia

Associate Professor Ilya Buynevich has been elected a Fellow of the Geological Society of America (GSA), a distinction that recognizes scientists who have demonstrated a sustained record of distinguished contributions to the geosciences through research, teaching, leadership, public engagement and professional service.

Buynevich's research spans coastal and marine geology, including barrier systems, aeolian environments, trace fossils and estuarine processes. He has authored more than 100 peer-reviewed journal articles and book chapters and recently served as a Fulbright Scholar. His work has taken him across four continents, where he has collaborated with colleagues on research cruises, field investigations and interdisciplinary studies that have expanded understanding of coastal evolution and environmental change.



"It is an honor to join prominent geoscientists from around the world as a Geological Society of America Fellow. This accomplishment is shared with many colleagues and students who divided long hours in the field, from the deserts of New Mexico to recently glaciated islands of the Baltic States, and the deep-sea shipwrecks offshore Ukraine."

– ILYA BUYNEVICH



GRADUATION SPEAKER CONTINUES AGRIVOLTAICS RESEARCH IN CANADA

by Greg Fornia

Graduating with a doctoral degree in geoscience, Caroline Merheb, CST '27, was a featured speaker at CST's 2026 graduation ceremony for master's and doctoral students.

"If there's one thing graduate school teaches you, it's how to survive on little sleep and a lot of uncertainty," said Merheb. "And if you're lucky, like I was, you might even get to do your research outside under solar panels, enjoying shade and growing your own food."

Merheb's research focus is agrivoltaics, and she is lead author of "Synergies and trade-offs of multi-use solar landscapes," published in the influential journal *Nature Sustainability*. Combing through years of data from previous agrivoltaics/solar photovoltaics research, Merheb searched for trends, such as increases in energy/food productivity; highlighted the benefits agrivoltaics have over separate systems for solar and food production, particularly in urban and small-scale farming contexts; and identified challenges to collocation scenarios and what could be done to improve the integration of these systems.

Supported by a Canada Impact+Reseach Award that recognizes outstanding international researchers, Merheb continues her work at the University of Calgary as a postdoctoral fellow. She will expand her work in agrivoltaics by developing a decision-support tool for farmers, solar developers and policymakers to improve system design and siting.



PHOTO: RYAN S. BRANDENBERG

LAURA TORAN LEAVES LASTING LEGACY

by Greg Fornia

Laura Toran, Weeks Chair in Environmental Geology and EES professor, retired in early 2026 following a career marked by excellence in research, teaching and service.

Toran joined Temple in 1997 after research appointments at Oak Ridge National Laboratory and the U.S. Geological Survey. She became a leading scholar in hydrology, groundwater and watershed science, while mentoring generations of students and helping shape the department's growth.

Her contributions were recognized with numerous honors, including the Dean's Distinguished Teaching Award, Dean's Distinguished Research Award and University Service Award. She was also named a Fellow of the Geological Society of America and served as executive editor of the journal *Groundwater* from 2021 to 2023.

Toran led and collaborated on major research initiatives focused on urban watersheds, stormwater management, critical zone science and environmental sustainability. Her work attracted significant support from organizations including NSF, William Penn Foundation, EPA and Pennsylvania Department of Transportation.

Toran remains with EES part time, wrapping up funded projects and continuing with research on urban hydrology, evaluating stormwater control measures and groundwater contamination.