ES SEMINAR SERIES
12:30-1:30 pm
03/30/2022
Zoom

Laurel Larsen

Comparative and placed-based hydrology in the digital age: Building understanding, promoting inclusivity, and forecasting the future

Abstract: Hydrologic studies and forecasts have traditionally been place-based, focused on a single watershed or hydrologic region. For this reason, it has often been pointed out that the discipline of hydrology lacks a general theory or set of organizational principles, with a primary disadvantage being difficulty in making predictions for regions without a long-term data record (also known as the PUB, or Prediction in Ungauged Basins, challenge). With the recent proliferation of environmental "big data," coupled with the rapidly advancing field of data science, opportunities abound to advance the subdiscipline of comparative hydrology—investigations that span many watersheds—and make progress on the challenge of PUB. In this talk I will discuss how the Environmental Systems Dynamics Laboratory is addressing challenges of data curation, using tools from information theory to understand functional classes of behavior that watersheds exhibit, and advancing the integration of physically based and data-driven models to forecast streamflow across the scale of the coterminous United States. Much of the success of this work depends on the Open Science movement and the hydrologic science community's adoption of principles of transparency, reproducibility, and accessibility. In the second part of the talk, I will explore how these principles are also transforming place-based hydrology, with a case-study focus on the Sacramento—San Joaquin Delta. I will argue that an inclusive shared visioning approach, enabled by technological advances and the Open Science movement, can help transition the science and governance community to one that is well equipped to manage the Delta in the face of rapid climate change.

Bio: Dr. Laurel Larsen is an Associate Professor at UC Berkeley with appointments in the Departments of Geography and Civil and Environmental Engineering. For 2020-2023, she is on leave to serve as the Delta Lead Scientist, a USGS position housed within the Delta Stewardship Council in Sacramento. Dr. Larsen runs the Environmental Systems Dynamics Laboratory at Berkeley, which has a focus on understanding the interactions and feedbacks among the physical, biological, and social variables constituting ecosystems, and to apply that understanding to restoration and management challenges. Dr. Larsen has a bachelor's degree from Washington University in St. Louis, with dual majors in Systems Science and Mathematics and Environmental Studies, a master's degree from Washington University in Earth and Planetary Sciences, and a PhD from the University of Colorado Boulder in Civil and Environmental Engineering. She has worked in the Everglades, Chesapeake Bay, coastal Louisiana, and most recently, the Sacramento--San Joaquin Delta.