Stanford



Benjamin Maki

Postdoctoral Scholar, Earth System Science

Bio

BIO

Ben joined Stanford's Earth System Science department as a postdoctoral scholar in February 2026. He is currently working on a series of projects related to the sustainable management of groundwater resources in California's Central Valley, where his work is focused within the context of managed aquifer recharge (MAR). MAR is a suite of methods used to redirect excess surface water into groundwater systems and has emerged as a key strategy to bank freshwater and restore groundwater levels throughout California. More specifically, his work focuses on better understanding the potential risks to groundwater quality posed by naturally occurring geogenic contaminants during recharge efforts, where changes to native geochemical conditions during recharge can result in the inadvertent mobilization of toxic naturally occurring contaminants, such as arsenic, uranium, chromium, and manganese. Current work funded through the Stanford Sustainability Accelerator, and in partnership with the Madera Irrigation District among other community partners, aims to establish a simple, functional multi-user focused toolkit to aid in effectively and safely scaling groundwater recharge efforts throughout the state. Importantly, this work focuses on both understanding community level concerns during local groundwater recharge projects, while simultaneously establishing effective groundwater quality monitoring protocols and designing simple, scalable, and effective field-scale management solutions to protect long-term groundwater quality.

Prior to joining Stanford, Ben completed his Ph.D. in Environmental Toxicology, with a designated emphasis in Public Policy, at the University of California Riverside (UCR). His dissertation research focused on assessing the mechanistic controls driving inadvertent geogenic metals solubilization and transformation within MAR systems designed to infiltrate untreated stormwater runoff using recharge basins on agricultural lands in the Pajaro Valley, CA. These systems were uniquely designed to remediate nitrate contamination within infiltrating stormwater via the application of carbon based (e.g., woodchips, almond shells, etc.) horizontal permeable reactive barriers, installed within basin surface soils, where carbon solubilization effectively stimulated native microbial communities to reduce and remediate excess nitrate during infiltration. However, the conditions that promote denitrification (e.g., excess organic carbon and shifts to oxygen depleted conditions) can also result in the solubilization of geogenic metals from soils. Ben’s dissertation work employed novel methods to assess how these processes were influenced by excess organic carbon availability and redox cycling, representative of the cycling wet and dry condition in basin soils during recharge, to better understand the balance between water quality tradeoffs and consider system management strategies to maximize water quality benefits while reducing risks. Preceding his time at UCR, Ben received a BS in Environmental Science from Western Washington University, where he studied the influences of amorphous iron oxyhydroxides and biological amendments on arsenic and iron bioavailability, fate, and transport in soils.

When not thinking about groundwater replenishment, Ben enjoys time with friends, family, and his partner Al and dog Rupert. He spends the bulk of his free time surfing on the California coast, exploring the Bay Area by bicycle and campervan, traveling to as many new places as possible, and enjoying live music, and good food and company along the way!

PROFESSIONAL EDUCATION

- Ph.D., University of California Riverside , Environmental Toxicology, Designated Emphasis in Public Policy (2025)
- B.S., Western Washington University , Environmental Science, Emphasis in Environmental Toxicology (2015)

STANFORD ADVISORS

- Scott Fendorf, Postdoctoral Faculty Sponsor

Publications

PUBLICATIONS

- **Nitrate Removal and Geogenic Contaminant Mobilization during Oxic-Anoxic Cycling of Managed Aquifer Recharge Basin Soils** *ACS ES&T WATER*
  Maki, B. C., Aiken, M. L., Abernathy, M. J., Thorpe, L., Chung, T., Serrano, A., Fisher, A. T., Ying, S. C.
  2026
- **Manganese: The rise of an unnoticed environmental contaminant** *Inorganic Contaminants and Radionuclides*
  Queiroz, H. M., Maki, B. C., Ferreira, A. D., Friol Boim, A. G., Ying, S. C., Nobrega, G. N., Otero, X. L., Ferreira, T. O.
  Elsevier.2024: 151-188
- **Enhancing soil health and nutrient availability for Carrizo citrange (X Citroncirus sp.) through bokashi and biochar amendments: An exploration into indoor sustainable soil ecosystem management** *SCIENTIA HORTICULTURAE*
  Pagliaccia, D., Ortiz, M., Rodriguez, M., Abbott, S., De Francesco, A., Amador, M., Lavagi, V., Maki, B., Hopkins, F., Kaplan, J., Ying, S., Vidalakis, G.
  2024; 326
- **The influence of hydrous ferric oxide, earthworms, and a hypertolerant plant on arsenic and iron bioavailability, fate, and transport in soils.** *Environmental science and pollution research international*
  Maki, B. C., Hodges, K. R., Ford, S. C., Sofield, R. M.
  2017; 24 (36): 27710-27723