Zach Perzan

PhD Candidate, Earth System Science, Stanford University

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EDUCATION

Ph.D.   **Earth System Science, Stanford University**   Expected May 2023
Gerald J. Lieberman Fellow
NSF Graduate Research Fellow
Advisor: Kate Maher

B.A.   **Geology (Honors), Middlebury College**   2015
Summa Cum Laude

PUBLICATIONS

9. **Perzan, Z.**, Bobb., C., Bargar, J., and Maher, K., *In prep,* Preferential floodplain solute transport under distinct drivers of inundation.

8. **Perzan, Z.**, Osterman, G. and Maher, K., 2023, Controls on flood managed aquifer recharge through a heterogeneous vadose zone: hydrologic modeling at a site characterized with hydrogeophysics. *Hydrology and Earth System Sciences*. doi: 10.5194/hess-2022-369 [link]

7. **Perzan, Z.**, and Chapin, T., 2023, WellSTIC: A cost-effective sensor for performing point dilution tests to measure groundwater velocity in shallow aquifers. *Water Resources Research*. doi: 10.1029/2022WR033223 [link]

6. Babey, T., Boye, K., Tolar, B., Engel, M., Noel, V., **Perzan, Z.**, et al., 2022, Simulation of anoxic lenses as exporters of reactivity in alluvial aquifer sediments. *Geochimica et Cosmochimica Acta.* doi: 10.1016/j.gca.2022.07.018 [link]

5. **Perzan, Z.**, Babey, T., Caers, J., Bargar, J.R. and Maher, K, 2021, Local and Global Sensitivity Analysis of a Reactive Transport Model Simulating Floodplain Redox Cycling. *Water Resources Research.* doi: 10.1029/2021WR029723 [link]

4. Li, Q., Wang, L., **Perzan, Z.**, Caers, J., et al., 2021, Global Sensitivity Analysis of a Reactive Transport Model for Mineral Scale Formation During Hydraulic Fracturing. *Environmental Engineering Science*. doi: 10.1089/ees.2020.0365 [link]

3. Damerow, J., Varadharajan, C., Boye, K., et al., 2021, Sample Identifiers and Metadata to Support Data Management and Reuse in Multidisciplinary Ecosystem Sciences. *Data Science Journal*. doi: 10.5334/dsj-2021-011 [link]

2. Munroe, J., **Perzan, Z.**, and Amidon, W., 2016. Cave sediments constrain the latest Pleistocene advance of the Laurentide ice sheet in the Champlain Valley, Vermont, USA. *Journal of Quaternary Science*. doi: 10.1002/jqs.2913 [link]

1. Schroth, A., Giles, C., Isles, P., Xu, Y., **Perzan, Z.**, and Druschel, G., 2015. Dynamic coupling of iron, manganese and phosphorus behavior in water and sediment of shallow ice-covered eutrophic lakes. *Environmental Science & Technology*. doi: 10.1021/acs.est.5b02057 [link]

HONORS & AWARDS

Preparing Future Professors Fellowship, Stanford University	2022
Gerald J. Lieberman Fellowship, Stanford University	2021

- Awarded to a student who shows "broad potential for leadership in academia"

Outstanding Poster, Computational Methods in Water Resources XXIII	2020
Outstanding Poster, Stanford Deep Learning Symposium	2019
NSF Graduate Research Fellowship (NSF-GRFP)	2017
U.S. Congress "Posters on the Hill"	2015

- One of 60 students invited to showcase research before Congress

National GeoCUR Award for Excellence in Student Research	2015
John M. White Award for Outstanding Work in Geology	2015
Outstanding Student Research Paper, Vermont Geological Society	2014

GRANTS & FELLOWSHIPS

Dept. of Energy Student Travel Grant ($1,500)	2023
Groundwater Resources Association of California Student Grant ($500)	2022
Stanford SPICE Grant ($1,075)	2021

- Funding to develop a new Indigenous Environmental Justice course

McGee-Levorsen Research Grant ($3,705)	2021
Shell Foundation Student Grant ($1,500)	2018
Vermont Geological Society Research Grant ($400)	2013
Middlebury Undergraduate Research Grant ($1,000)	2013

TEACHING EXPERIENCE

Instructor of Record

Indigenous Environmental Justice   2022
Stanford University

- Designed and taught a new course on Indigenous Environmental Justice
- Broad swath of students, including undergraduates, law students, medical students, earth scientists, and environmental engineering MS students

Teaching Assistant

Contaminant Hydrogeology   2019 – 2023
Stanford University

- Graduate-level course for 10-15 environmental engineers and earth scientists
- Designed new course material and delivered 1-2 lectures per quarter
- Quality of instruction rated 4.55/5 over four years

Intro. to Environmental Science   2022
University of San Francisco

- Core course of the curriculum designed for first-year undergraduates

Physical Oceanography   2013 – 2014
Middlebury College

- Introductory earth sciences course with 35-40 undergraduates
- Led weekly lab sections aboard a research vessel, the *R/V David Folger*

MENTORSHIP

Master's degree students:
- Ziyan Wu: Preparing manuscript as part of ongoing research project. Currently PhD student at University of Wisconsin-Madison (2019-2021)

Bachelor's degree students:
- Timothy Dai: Computer science student working on ML emulators (since 2022)
- Marc Berghouse: Now pursuing MS and PhD at the University of Nevada, Reno. Co-author on multiple conference presentations (2018-2021)
- Diana Velazquez: Summer Undergraduate Research in Geoscience and Engineering (SURGE; now an REU). Currently PhD student at U. Michigan (2019)

Associate degree students:
- Bailey Lewis: Now pursuing BS in Earth Science at UC Berkeley (2019-2020)
- Cassie Weed: Field intern in Wyoming. Now at Bureau of Land Management (2019)
- George Sims: Presented work at the Wyoming Undergraduate Research Day (2018)
- Dustin Proctor: Field intern in Wyoming, co-advised with Callum Bobb. (2018)

PEDAGOGICAL TRAINING

Preparing Future Professors Program	2022
- Shadowed a faculty member for 3 months at the University of San Francisco	
- Included guest lectures, faculty meetings, field trips, curriculum planning	
Designing a Learning-centered Syllabus	2022
Accessibility in Action: Designing for Universal Learning	2022
National Environmental Justice Education and Teaching Workshop	2021
Setting the Foundation: Starting with Learning and Working Backwards	2021

SERVICE AND OUTREACH

AGU Session Chair   2022
American Geophysical Union Fall Meeting
- Chair for long-running "Groundwater-Surface Water Interactions" session

Mail-in Proposal Reviewer   2022
Biological and Environmental Research, Dept. of Energy
- Reviewer for Environmental System Science SBIR and STTR proposals

Graduate Teaching Mentor   2021 – 2022
School of Earth, Stanford University
- Facilitated pedagogy workshops for Stanford faculty, instructors and teaching assistants

Faculty Search Committee Student Representative   2021
School of Earth, Stanford University
- Faculty search focused on candidates with strong DEI proposals

Small Business Innovation and Research Advisor   2019 –
Quantitative BioSciences, Inc
- Helped biotech startup secure three DOE small business research grants

Lab Safety Coordinator   2019 –
School of Earth, Stanford University
   - Manage lab safety training and assessments on behalf of other students

Northern Arapaho Environmental Meeting   2019
Northern Arapaho Tribe, Wind River Reservation
   - Outreach event on the Wind River Indian Reservation designed to introduce Middle and High School students to research in Environmental Science

Invited Speaker   2019
Stanford Earth Young Investigators, Stanford University
   - Discuss graduate school and career path with high school summer interns interested in Earth Science research

Reviewer for: Journal of Hydrology (11), Water Resources Research (2), Environmental Science & Technology, Hydrological Processes, AGU Books, Petroleum Research

SELECTED CONFERENCE PRESENTATIONS

Perzan, Z. and Maher, K., 2022, Contaminant flushing and groundwater mixing during managed aquifer recharge: a particle tracking approach. American Geophysical Union Annual Meeting, Chicago, IL.

Fang, K., **Perzan, Z.,** and Maher, K., 2022, WaterNet: A process-based and explainable deep learning framework modeling stream discharge. American Geophysical Union Annual Meeting, Chicago, IL.

Perzan, Z., Osterman, G., Knight, R., and Maher, K., 2022, A geostatistical workflow for evaluating flood-MAR sites using geophysical data. The 11th International Symposium on Managed Aquifer Recharge, Long Beach, CA.

Perzan, Z., 2022, Groundwater modeling in the face of uncertainty. ISMARx, Long Beach, CA.

Wang, L., **Perzan, Z.,** Babey, T., et al., 2021, Uncertainty quantification of water exchanges due to beaver-induced inundation. American Geophysical Union Annual Meeting.

Babey, T., **Perzan, Z.,** Rogers, D.B., Wang., L., Pierce, S., Bargar, J. and Maher, K., 2021, Hydro-biogeochemical response of oxic-anoxic interfaces to beaver dam construction in a simulated floodplain aquifer. American Geophysical Union Annual Meeting.

Perzan, Z., Babey, T., and Maher, K., 2020, Interpreting Parameter Interactions using Global Sensitivity Analysis on a Hillslope-scale Reactive Transport Model. American Geophysical Union Annual Meeting.

Perzan, Z., Babey, T., and Maher, K., 2020, Short-term water quality forecasting with continuous-time recurrent neural networks. Computational Methods in Water Resources XXIII.

Babey, T., Boye, K., **Perzan, Z.**, Bargar, J.R., and Maher, K., 2020, Simulation of biogeochemical cycling in a synthetic alluvial aquifer. Computational Methods in Water Resources XXIII.

Perzan, Z., Boye, K., Berghouse, M., Fendorf, S., Bargar, J.R., and Maher, K., 2019, Seasonal nutrient cycling between the saturated and unsaturated zones in a contaminated floodplain. American Geophysical Union Annual Meeting, San Francisco, CA.

Perzan, Z., 2019, Forecasting groundwater quality using continuous-time recurrent neural networks. Stanford Deep Learning Symposium, Stanford, CA.

Babey, T., **Perzan, Z.**, Boye, K., Bobb., C., Bargar, J.R., and Maher, K, 2019, Modeling of biogeochemical responses to hydrologic transitions in floodplain aquifers. American Geophysical Union Annual Meeting, San Francisco, CA.

Roycroft, S., Boye, K., **Perzan, Z.**, Johnson, R., Dam, W., Noel, V., Fendorf., S., Bargar, J.R., 2019, Uranium mobilization across saturated-unsaturated interfaces. Goldschmidt2019, Barscelona, Spain.

Perzan, Z., Manley, P.L., Manley, T.O., Manary, T., Kraft, M., Juteau, J-P., and Singer, J.,2016, Sediment transport dynamics of a shallow bay: Missisquoi Bay, Lake Champlain, VT. Association for the Sciences of Limnology and Oceanography (ASLO) Meeting, Santa Fe, NM

Perzan, Z., Amidon, W., and Munroe, J., 2014, Investigation of last interglacial sediment in Weybridge Cave, Vermont. Geological Society of America (GSA) Annual Meeting, Vancouver, Canada