

Zach Perzan

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EDUCATION

- Ph.D.** **Stanford University**, Stanford, CA
2017 – Earth System Science, Anticipated August 2022
 Dissertation title: Understanding transient solute and gas fluxes in floodplains
 Advisor: Kate Maher
 Dissertation committee: Steve Gorelick, Jef Caers, John Bargar, Ram Rajagopal
- B.A.** **Middlebury College**, Middlebury, VT
2011 – 2015 Geology, Summa Cum Laude
 Honors thesis: A pre-Wisconsinan sedimentary record from Weybridge Cave, VT
 Advisors: Jeff Munroe and Will Amidon

RESEARCH EXPERIENCE

- 2017 – **National Science Foundation Graduate Research Fellow**
 Stanford University, Stanford, CA
 -Diverse array of research, including field work throughout the western U.S.,
 lab-based geochemical analyses, and hydrologic modeling
- 2017 – **Research Assistant**
 SLAC National Accelerator Lab, Menlo Park, CA
 -Designed and built water quality sensor monitoring network, including sensor
 deployment at remote field sites and integrated data processing workflow
- 2015 **Cave Scientist**
 U.S. Bureau of Land Management
 -Drafted land management policies regarding local lava tube caves
 -Mapped several miles of lava tube caves using ground-based LiDAR
- 2014 – 2015 **Oceanography Technician**
 R/V David Folger
 -Operated the research lab on a state-of-the-art, \$1.7M research vessel
 -Assimilated over 9 million observations of lake hydrodynamics into an
 integrated circulation model for a shallow bay on Lake Champlain (VT/NY)
- 2013 – 2015 **Geochronology Lab Manager**
 Middlebury College, Middlebury, VT
 -Developed protocols and standards – including writing software for new
 instrumentation – for a luminescence geochronology lab built in August 2013

2013

Oceanography Research Assistant

Vermont EPSCoR, Burlington, VT

-Analyzed raw sonar data collected on Lake Champlain and developed a website for disseminating curated data to the public

PUBLICATIONS

Peer-Reviewed Journals

Perzan, Z., Babey, T., Caers, J., Bargar, J.R., and Maher, K., Local and global sensitivity analysis of a reactive transport model simulating floodplain redox cycling. (submitted to [Water Resources Research](#))

Li, Q., Wang, L., **Perzan, Z.**, Caers, J., Brown, G.E., Bargar, J.R., and Maher, K., 2021, Global Sensitivity Analysis of a Reactive Transport Model for Mineral Scale Formation During Hydraulic Fracturing. [Environmental Engineering Science](#), 38 (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](#), 20 (11), pp. 1-19.

Manley, T., **Perzan, Z.**, Manley, P., and Wei, E., 2020. Unexpected vertical shear in a shallow, eutrophic bay, Lake Champlain, Vermont. (submitted to [Limnology and Oceanography](#))

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](#), 31 (8), pp. 893-904.

Schroth, A., Giles, C., Isles, P., Xu, Y., **Perzan, Z.**, and Druschel, G., 2015. Dynamic coupling of iron, manganese, and phosphorous behavior in water and sediment of shallow ice-covered eutrophic lakes. [Environmental Science and Technology](#), 49 (16), pp. 9758-9767.

TEACHING EXPERIENCE

2019 – 2021

Teaching Assistant

Contaminant Hydrogeology, Stanford University, Stanford, CA

- Graduate-level course predominantly for MS and PhD students
- Designed new course material, including both problem sets and lectures
- Planned and led twice weekly discussion and review sessions
- Delivered guest lectures each quarter

2015

Co-instructor

Intro. to Cave Science, Craters of the Moon National Monument, ID

- Co-designed lecture- and field-based short course on lava tube caves
- Led field excursions to local caves to explore their geologic significance

2013 – 2014 **Teaching Assistant**
 Physical Oceanography, Middlebury College, Middlebury, VT
 - Graded presentations and problem sets, held office hours, mentored students
 and led weekly labs aboard the R/V David Folger

MENTORSHIP

Community College (), Undergraduate (†) and Graduate (‡) Student Mentees*

2019 – **Ziyan Wu**[‡]. Preparing manuscript as part of ongoing research project. Recently graduated from MS program and applying to Ph.D. programs.
 2018 – **Marc Berghouse**[†]. Now pursuing MS and Ph.D. at the University of Nevada, Reno. Co-author on multiple conference presentations.
 2019 – 2020 **Bailey Lewis**^{*}. Presented research results at the Wyoming Undergraduate Research Day 2019. Now pursuing BS in Earth Science at UC Berkeley.
 2019 – 2020 **Cassie Weed**^{*}. Field intern in Wyoming over multiple field seasons. Now working for the U.S. Bureau of Land Management.
 2019 **Diana Velazquez**[†]. Summer Undergraduate Research in Geoscience and Engineering (SURGE; now an REU). Currently applying to Earth Science Ph.D. programs.
 2018 – 2019 **George Sims**^{*}. Presented work at the Wyoming Undergraduate Research Day 2019. Co-advised with Callum Bobb.
 2018 **Dustin Proctor**^{*}. Summer field intern in Wyoming, co-advised with Callum Bobb.

SERVICE AND OUTREACH

2021 **Faculty Search Committee Student Representative**
 Search focused on advancing JEDI (Justice, Equity, Diversity and Inclusion)
 School of Earth, Stanford University

2018 – **Northern Arapaho Environmental Meeting**
 Northern Arapaho Tribe, Wind River Reservation, WY
 -Outreach event on the Wind River Indian Reservation designed to introduce Middle and High School students to research in Environmental Science.

2019 – **Small Business Innovation and Research Advisor**
 Quantitative BioSciences Inc, San Diego, CA
 -Helped biotech startup secure three DOE small business research grants
 -Provided expertise and assistance in making new sensor tech field-deployable

2019 – **Data Manager and Archivist**
 SLAC-SFA, SLAC National Accelerator Lab, Menlo Park, CA
 -Developed GitHub data management and archiving platform for large research program across multiple institutions

2019 – **Lab Safety Coordinator**
 Environmental Geochemistry Group, Stanford University, Stanford, CA

-Manage lab safety assessments, training and supplies on behalf of other students

- 2018 – 2020 **Graduate Student Mentor**
Earth System Science, Stanford University, Stanford, CA
-Mentor incoming Earth Science graduate students over their first year
- 2018 – 2019 **Data Archiving Standard Development**
ESS-DIVE, Lawrence Berkeley National Lab, Berkeley, CA
-Helped test and create data archiving and sample naming standards used by all DOE Biological and Environmental Research (BER) research programs
- 2019 **Invited Speaker**
Stanford Earth Young Investigators, Stanford University, Stanford, CA
-Discuss graduate school and career path with high school summer interns interested in Earth Science research

Reviewer for: Journal of Hydrology (5), Water Resources Research, Environmental Science & Technology, Hydrological Processes, American Geophysical Union Books, Petroleum Research

GRANTS AND AWARDS

- 2020 – Outstanding Poster Award, Computational Methods in Water Resources XXIII
2019 – Outstanding Poster Award, Stanford Deep Learning Symposium
2017 – NSF Graduate Research Fellowship (GRFP) (\$138,000)
2015 – National GeoCUR Award for Excellence in Student Research
2015 – John M. White Award, for Excellence in Research in Geology (\$800)
2014 – Outstanding Student Research Paper, Vermont Geological Society
2013 – Vermont Geological Society Research Grant (\$400)
2013 – Middlebury Undergraduate Research Grant (\$1,000)

CONFERENCE PRESENTATIONS

- 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.
- Bargar, J.R., Noel, V., **Perzan, Z.**, Boye, K., Janot, N., Williams, K.H., 2019, Hydrological-Biogeochemical controls over uranium redox rates. [SSSA International Soils Meeting](#), San Diego, CA.
- Manley, T.O., **Perzan, Z.**, Herdman, L., and Chen, T., 2018, Circulation dynamics of Missisquoi Bay: A new look at the question of water quality and causeways. [Geological Society of America – Northeastern Section Meeting](#), Burlington, VT
- 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
- Manley, T., **Perzan, Z.**, Manley, P., and Wei, E., 2016, Unexpected vertical shear in a very shallow bay of Lake Champlain, Vermont: implications for management and modeling. [International Society of Limnology \(SIL\) Meeting](#), Torino, Italy
- Perzan, Z.**, Munroe, J., and Amidon, W., 2015, A potential long-term climate record from Weybridge Cave, Vermont, USA. [U.S. Congress: “Posters on the Hill”](#), Washington, D.C.
- *One of 60 students invited to showcase research before members of congress
- Perzan, Z.** and Amidon, W., 2015, A pre-Wisconsinan sedimentary record from a cave in central Vermont. [New World Luminescence Dating Workshop](#), Manhattan, KS
- Perzan, Z.**, Manley, T., and Manley, P., 2015, Hydrodynamics and sediment dynamics of Missisquoi Bay, Lake Champlain. [Vermont EPSCoR Research Symposium](#), Burlington, VT
- 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
- Perzan, Z.**, Amidon, W., and Munroe, J., 2014, A potential pre-Wisconsinan paleoenvironmental record from Weybridge Cave, VT. [Vermont Geological Society Meeting](#), Middlebury, VT
- Perzan, Z.**, Munroe, J., and Amidon, W., 2014, Origin and significance of clastic sediments within Weybridge Cave, VT. [Geological Society of America – Southeastern Section Meeting](#), Blacksburg, VA