

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](#). *In press*.

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

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, 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](#), Barcelona, 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