Galen Gorski

U.S. Geological Survey
509.869.2314 galengorski@berkeley.edu
galengorski.github.io

RESEARCH INTERESTS

Macroscale hydrology; water resources/water quality management; aquatic biogeochemical cycling; groundwater-surface water interactions; watershed hydrology; machine learning; high-frequency water quality measurements; data science; science communication

POSITIONS HELD

Machine learning specialist *2021-*
United States Geological Survey *Reston, Virginia*
Analysis and Prediction Branch
Water Mission Area

Postdoctoral Scholar *Jan.-Jul. 2021*
Department of Geography, University of California, Berkeley
Advisor: Laurel Larsen

Postdoctoral Researcher *Oct.-Dec. 2020*
Department of Earth and Planetary Science, University of California, Santa Cruz
Advisors: Andrew Fisher and Margaret Zimmer

NSF Graduate Research Intern *2018 - 2020*
USGS New Jersey Water Science Center
Advisor: Dan Goode

NSF Graduate Fellow *2016 - 2020*
Department of Earth and Planetary Science, University of California, Santa Cruz
Advisors: Andrew Fisher (Primary Advisor), Adina Paytan (Co-Advisor)

Biological Science Technician *2014 - 2015*
Department of Soil, Water, and Climate, University of Minnesota/USDA
Advisors: John Baker and Tim Griffis

Laboratory Technician *2013 - 2014*
Department of Geology and Geophysics, University of Utah
Advisor: Gabe Bowen

EDUCATION

University of California, Santa Cruz, Santa Cruz, CA *2020*
Department of Earth and Planetary Science
PhD Hydrogeology
Advisors: Andrew Fisher (Primary Advisor), Adina Paytan (Co-Advisor)

Carleton College, Northfield, MN *2013*
Department of Chemistry
BA

PUBLICATIONS *In Prep:*

Gorski G., Cook S., Snyder A., Appling A., Thompson T., Smith J., and Warner J. C., Using deep learning and hydrodynamic modeling to understand and simulate salinity dynamics in the Delaware Bay. Target: *Frontiers in Marine Science*

Gorski G., Larsen L., Wingenroth J., Bellugi D., Zhang L. Developing generalizable water quality models in diverse watersheds using methods from deep learning. Target: *Hydrology and Earth System Sciences.*

In Review:

Gorski G., Fisher A.T., Beganskas S., Dailey H., Schmidt C. Mapping the potential for denitrification during infiltration with machine learning informed by field and laboratory experiments. *Hydrologic Processes.*

Schrad N., Pensky J., **Gorski G.,**, Beganskas S., Fisher A.T., Saltikov C., Soil characteristics and redox properties of infiltrating water are determinants of microbial communities at managed aquifer recharge sites. *FEMS Microbiology Ecology.*

Published:

Pensky J., Fisher A.T., **Gorski G.**, Schrad N., Dailey H., Beganskas S., Saltikov C., Enhanced cycling of nitrogen and metals during rapid infiltration: implications for managed recharge. (2022) *Science of the Total Environment.* 838, 156439.
doi.org/10.1016/j.scitotenv.2022.156439

Gorski G., Zimmer M.A. Hydrologic regimes drive nutrient export behavior in human impacted watersheds. (2021) *Hydrology and Earth System Science.* 25, 1333-1345
doi.org/10.5194/hess-25-1333-2021

Van der Valk M., ElHariry N.H., **Gorski G.,** Goode D.J. (2021) Suitability mapping for regional screening, section p. 4-27 of Goode D.J. ed., Managed aquifer recharge suitability–Regional screening and case studies in Jordan and Lebanon: U.S. Geological Survey Open-File Report 2021-1089
doi.org/10.3133/ofr20211089

Pensky J., Richardson C., Serrano A., **Gorski G.,** Price A.N., Zimmer M.A., (2021) Disrupt and demystify the unwritten rules of graduate school. *Nature Geosciences* 14, 538-539.
doi.org/10.1038/s41561-021-00799-w

Gorski G., Dailey H., Fisher A.T., Schrad N., Saltikov C. (2020) Denitrification during infiltration for managed aquifer recharge: Infiltration rate controls and microbial response. *Science of the Total Environment*, 727, 138642.
doi.org/10.1016/j.scitotenv.2020.138642

Balestra B., Orland I.J., Fessenden-Rahn J., **Gorski G.,** Franks R., Rahn T., Paytan A. (2020) Paired analyses of oxygen isotope and elemental ratios within individual shells of benthic foraminifera genus *Uvigerina*. *Chemical Geology*, 533, 119377.
doi.org/10.1016/j.chemgeo.2019.119377

Gorski G., Fisher A.T., Beganskas S., Weir W., Redford K., Schmidt C., Saltikov C. (2019) Field and laboratory studies linking hydrologic, geochemical, and microbiological processes and enhanced denitrification during infiltration for managed recharge. *Environmental Science and Technology*, 53, 9491-9501.
doi/10.1021/acs.est.9b01191

Beganskas S., **Gorski G.**,Weathers T., Fisher A.T., Schmidt C., Saltikov C.W., Redford K., Stoneburner B., Harmon R., Weir W. (2018) A horizontal permeable reactive barrier stimulates nitrate removal and shifts microbial ecology during rapid infiltration for managed recharge. *Water Research*, 144, 274-284.
doi.org/10.1016/j.watres.2018.07.039

Griffis T.J., Wood J.D., Baker J.M., Lee X., Xiao K., Chen Z., Welp L.R., Schultz N.M., **Gorski G.**, Chen M., Nieber J. (2016) Investigating the source, transport, and isotope composition of water vapor in the planetary boundary layer. *Atmospheric Chemistry and Physics Discussion*, 16, 5139-5157.
doi.org/10.5194/acp-16-5139-2016

Gorski G., Strong C., Good S.P., Bares R., Ehleringer J.R., Bowen G.J. (2015) Vapor hydrogen and oxygen isotopes reflect water of combustion in the urban atmosphere. *Proceedings of the National Academy of Sciences*, 112, 3247-3252.
dx.doi.org/10.1073/pnas.1424728112

AWARDS AND FELLOWSHIPS

UCSC Aaron and Elizabeth Waters Award for best qualifying exam	*June 2018*
NSF Graduate Research Fellowship –3 years full funding	*March 2016*
UCSC Environmental Studies Hammett Graduate Fellowship	*March 2016*

MENTORING AND OUTREACH

Hidden Curriculum Graduate Level Course —Co-Organizer
In collaboration with a group of graduate students and a faculty mentor from the EPS department at UC Santa Cruz, I helped develop a graduate level course centered around the "Hidden Curriculum" in geoscience graduate education. Through short readings, activities, and group discussions the course focused on aspects of graduate school that are often not addressed in a formal setting, but are still essential for successful development as a scientist, such as time management, research brand development, and mentoring.

Cultivamos Excelencia —Graduate Student Mentor
I served as a mentor for two community college students from San Jose City College interested in transferring to a four-year university. The program consisted of weekly meetings with the mentees, a year-long research project designed and conducted by the mentees, and an end-of-year research symposium.

Expand Your Horizons —Facilitator
An event for girls from Santa Cruz and Monterey County public schools, grades 5-10, to learn about earth science topics. I have helped facilitate activities on plate tectonics and ocean acidification.

Institute for Scientists and Engineer Educators Professional Development Program —Graduate Student Participant
A two-part workshop for early career scientists interested in education and teaching. The workshops focused on experiential learning and creating classroom environments inclusive to a diversity of identities and learning styles. I planned and executed a lesson plan for an Introductory Chemistry course on campus using techniques I had learned in the

workshops.

GIS Workshop as part of NSF-GRIP internship
As part of the NSF Graduate Research Internship Program (GRIP) that I took part in, I led a GIS workshop with participants and stakeholders from Lebanon, Palestine, Jordan, Egypt, Cyprus, and the United States. The workshop was part of a larger collaborative meeting, and its goals were to help transfer skills and build capacity in our partnering countries as part of wider project goals centered on regional groundwater security and sustainability.

Community College Rise —Graduate Student Mentor
A program designed to give community college students research experience during the summer. I served as a mentor for Molly Cribari, a community college student, who performed lab work, analyzed water samples in our laboratory facilities, and delivered an oral presentation on her research topic at the end of the 10-week session.

SELECTED PRESENTATIONS

Gorski G., Larsen L., Wingenroth J., Zhang L., Bellugi D., Using deep learning and site clustering to develop predictions of in-stream nitrate in intensively managed watersheds *Invited oral presentation at national meeting of the American Geophysical Union* (Chicago, IL December 2022)

Gorski G., Thompson T., Snyder A., Cook S., Warner J.C., Smith J., Appling A.P., Using information theory to compare deep learning and hydrodynamic model prediction of salinity intrusion dynamics in the Delaware Bay *Poster presentation at Frontiers in Hydrology* (San Juan, Puerto Rico June 2022)

Gorski G., Wingenroth J., Larsen L, Developing generalizable water quality models in agricultural watersheds using Long Short-Term Memory networks (LSTMs). *Oral presentation at the national meeting of the American Geophysical Union* (Virtual December 2021)

Gorski G., Zimmer M.A., Hydrologic regimes drive nitrate export in human impacted watersheds. *Oral presentation at the Society for Freshwater Science meeting* (Virtual May 2021)

Gorski G., Fisher A.T., Beganskas S., Schmidt C., Dailey H. Mapping denitrification during infiltration with machine learning informed by field and laboratory information. *Oral presentation at the national meeting of the American Geophysical Union* (Virtual December 2020)

Gorski G., Fisher A.T., Beganskas S., Schmidt C., Dailey H. Using machine learning to incorporate potential water quality improvements for mapping MAR suitability. *Oral presentation at the International Symposium for Managed Aquifer Recharge* (Madrid, Spain May 2019)

Gorski G., Dailey H., Fisher A.T. Coupling benefits to water quantity and quality through stormwater collection linked to managed recharge. *Oral presentation at the Biennial Symposium on Managed Aquifer Recharge* (San Diego, CA March 2018)

Gorski G., Beganskas S., Weir W., Redford K., Saltikov C., Fisher A.T. Linking field and laboratory studies to investigate enhanced nitrate removal using permeable reactive barrier technology during managed recharge. *Oral presentation at the national meeting of the American Geophysical Union* (New Orleans, LA December 2017)

COMPUTER SKILLS Adobe Illustrator, ArcGIS, EddyPro, github, HYDRUS (Variably saturated hydrologic modeling), R, Rshiny, LaTeX, MatLab, MySQL, Python, Pytorch, Surfer, SWAT, UNIX shell scripting