RICHARD (RICH) PAULOO
CURRICULUM VITAE

he/him/his
richpauloo@gmail.com
Website: https://richpauloo.com
Github: https://github.com/richpauloo

EDUCATION

2020 **Ph.D. Hydrology.** Designated Emphasis in Climate Change, Water, and Society.
University of California, Davis
2011 **B.A. Integrative Biology.** Minor in Conflict Resolution.
University of California, Berkeley

EMPLOYMENT HISTORY

2022 – present Data Science Manager, Accenture: *manage $6MM/yr in Innovation Funds for delivery in climate impact, electrification, remote sensing, and AI*
2019 – 2022 Co-Founder, Water Data Lab: *science & engineering worker-owned cooperative*
2019 – 2022 Hydrogeologist & Senior Data Scientist, Larry Walker Associates: *co-managed $2MM/yr for sustainable groundwater management implementation*
2015 – 2020 Graduate Researcher, NSF-IGERT and US-China Clean Energy Research Center
2015 – 2015 Expedition Lead, National Geographic Student Expeditions (Thailand)
2012 – 2015 Environmental Science Teacher, NatureBridge 501(c)3 (Yosemite, Marin)
2011 – 2012 Undergraduate Research Assistant, UC Berkeley Fine Lab

GRANTS AND FUNDING

Total funding awarded: **$264,700**

3. Environmental Policy Innovation Center. “Creation of a Nationwide Water Service Boundary Layer.” 2022. **$60,000**. Role: PI.
2. Microsoft Artificial Intelligence for Earth. “Forecasting Regional-Scale Water Shortages Caused by Drought.” 2020-2021. **$100,000**. Role: PI.
1. National Science Foundation Integrative Graduate Education & Research Traineeship. 2015-2018. **$104,700**. Role: NSF Trainee.

REFERRED JOURNAL PUBLICATIONS

11. Kourakos, G., **Pauloo, R.A.**, and Harter, T. (2024). “An Imputation Method for Simulating 3D Well Screen Locations from Limited Regional Well Log Data.” *Groundwater*. 10.1111/gwat.13424
10. Wang, C., **Pauloo, R.A.**, and Fogg, G. E. (2024). “Groundwater basin openness and sustainability.” *Water Resources Research*. 10.1029/2023WR035446
9. Bostic, D., Mendez-Barrientos, L., **Pauloo, R.A.**, Dobbin, K., and MacClements, V. (2023). “Thousands of domestic and public supply wells face failure despite groundwater sustainability reform in California’s Central Valley.” *Nature Scientific Reports*, *13*(1), 14797. 10.1038/s41598-023-41379-9.

8. Castrellón, M. G., **Pauloo, R. A.**, Popescu, I., and Fábrega, J. (2023). "ONASP: A web application for groundwater data visualization in Panama." *IOP Conference Series: Earth and Environmental Science* (Vol. 1136, No. 1, p. 012028). 10.1088/1755-1315/1136/1/012028.
7. Guo, Z., Fogg, G. E., Chen, K., **Pauloo, R.A.**, and Zheng, C. (2023). "Sustainability of regional groundwater quality in response to managed aquifer recharge." *Water Resources Research*, *59*(1), e2021WR031459. 10.1029/2021WR031459.
6. Ahamed, A., Knight, R., Alam, S., **Pauloo, R.A.**, and Melton, F. (2022). "Assessing the utility of remote sensing data to accurately estimate changes in groundwater storage." *Science of The Total Environment*, *807*, 150635. 10.1016/j.scitotenv.2021.150635.
5. **Pauloo, R. A.**, Fogg, G. E., Guo, Z., and Henri, C. V. (2021). "Mean flow direction modulates non-fickian transport in a heterogeneous alluvial aquifer-aquitard system." *Water Resources Research*, *57*(3), e2020WR028655. 10.1029/2020WR028655.
4. **Pauloo, R. A.**, Fogg, G. E., Guo, Z., and Harter, T. (2021). "Anthropogenic basin closure and groundwater salinization (ABCSAL)." *Journal of Hydrology*, *593*, 125787. 10.1016/j.jhydrol.2020.125787.
3. Calderwood, A.J., **Pauloo, R.A.**, Yoder, A.M., and Fogg, G.E. "Low-Cost, Open Source Wireless Sensor Network for Real-Time, Scalable Groundwater Monitoring." *Water*. 2020; 12(4):1066. 10.3390/w12041066.
2. **Pauloo, R. A.**, Escriva-Bou, A., Dahlke, H., Fencl, A., Guillon, H., and Fogg, G. E. "Domestic well vulnerability to drought duration and unsustainable groundwater management in California's Central Valley." *Environmental Research Letters* 15.4 (2020): 044010. 10.1088/1748-9326/ab6f10.
1. Hwang, L. J., **Pauloo, R. A.**, and Carlen J. (2020) "Assessing the Impact of Outreach Through Software Citation for Community Software in Geodynamics." *Computing in Science & Engineering*, vol. 22, no. 1, pp. 16-25. 10.1109/MCSE.2019.2940221.

INVITED TALKS AND LECTURES

5. **Pauloo, R.A.**, Guo, Z., Henri, C.V., and Fogg G.E. (2020). "Mean flow direction modulates non-Fickian transport in a heterogeneous alluvial aquifer-aquitard system." AGU Fall Meeting, 2020.
4. **Pauloo, R.A.** (2020) "Peril and Promise: Groundwater Overdraft & Next Generation Monitoring." We Manage What We Measure: A Napa Water Forum.
3. **Pauloo, R.A.** (2020) "Understanding the Impacts of Regional-Scale Aquifer Depletion: Numerical and Data-Driven Models of Basin Salinization, Contaminant Transport, and Well Failure." Lawrence Berkeley Lab.
2. **Pauloo, R.A.** (2019). "Reproducible, Open-Source, Transparent Data Analysis (and more) in Python and R." California State Water Resources Control Board.
1. **Pauloo, R.A.**, Fogg, G.E., Escriva-Bou, A., Fencl, A., Guillon H. (2019). "An Overview of Domestic Well Data in California's Central Valley: Opportunities for Informed Risk Assessment." California State Water Resources Control Board Drinking Water Needs Assessment Workshop.

DECISION SUPPORT TOOLS

- **gspdrywells.com**: forecasted dry wells due to aquifer depletion in California's Central Valley, funded by Microsoft AI for Earth; reported in *Nature Scientific Reports* and *Environmental Research Letters*.
- **calwaterquality.com**: automated consumer confidence reports for 2,067 California public water systems.

- **National Groundwater Observatory of Panama**: reported in *IOP Conference Series*.
- **California Groundwater Observatory**: reported in *Water*.
- **Computational Infrastructure for Geodynamics**: contextualizing geodynamic software citations; reported in *Computing in Science & Engineering*.

OPEN-SOURCE SOFTWARE, DATA, AND CURRICULUM

- **R for Water Resources Data Science**: courses in introductory and intermediate data science for environmental scientists, geologists, and water resources engineers.
- **U.S.A. water service boundaries**: spatial boundary data for 44,919 community water systems that deliver tap water to 307 million people in the US (97.22% of the population served by active community water systems and 90.85% of active community water systems).
- **textme**: an R package for text message notifications after long-running computer simulations complete.
- **sdwisard**: an R package to query the California Drinking Water Information System (SDWIS) database.

SELECTED NON-REFERRED PUBLICATIONS

7. **Pauloo, R.A.,** Escriva-Bou, A. (2021). "Opinion: How better data can help California avoid a drinking water crisis." *Cal Matters*. Originally published by the *Public Policy Institute of California*.
6. **Pauloo, R.A.,** Fogg, G.E. (2021). "Groundwater Salinization in California's Tulare Lake Basin, the ABCSAL model." *California Water Blog*.
5. **Pauloo, R.A.,** Foglia, L., Applegate O., Grovhoug, T. (2021). "South American Subbasin Groundwater Sustainability Plan, Section 3 – Sustainable Management Criteria." [PDF]
4. **Pauloo, R.A.**, Weiner, J. (2021). "South American Subbasin Groundwater Sustainability Plan, Appendix 3A – Interconnected Surface Water." [PDF]
3. **Pauloo, R.A.** (2021). "South American Subbasin Groundwater Sustainability Plan, Section 3C – Vulnerable Well Impact Analysis." [PDF]
2. **Pauloo, R.A.,** Foglia, L., Applegate O., Tolley, D. (2021). "Sierra Valley Groundwater Sustainability Plan, Section 3 – Sustainable Management Criteria." [PDF]
1. Bostic, D., Dobbin, K., **Pauloo, R.A**., Mendoza, J., Kuo, M., and London, J. (2020). "Sustainable for Whom? The Impact of Groundwater Sustainability Plans on Domestic Wells." *Pacific Institute*. [PDF]

CONFERENCES, WORKSHOPS, AND CONFERNCE SESSIONS CONVENED AND CHAIRED

- "U42A: Integration of Climate, Hydrology, Social Science, and Water Management: Connecting Hydroclimate Models with Stakeholder Need." AGU Fall Meeting, 2016. Role: Chair.
- "Weathering Change: The Impact of Climate and the Sustainable Groundwater Management Act on California's Water." Climate Change, Water, and Society IGERT at UC Davis, 2016. Role: Co-Convener.

SELECTED CONFERENCE ABSTRACTS

- Wang, C., **Pauloo, R.A.**, and Fogg, G.E. (2021) "Groundwater Salinization Under Irrigated Farmlands: Impact of Groundwater Development Strength and Basin Closure Status." AGU Fall Meeting, 2021.
- Escriva-Bou, A., **Pauloo, R.A.**, and Lewis, S. (2021) "Assessing risks of water shortages for small communities in California's Central Valley by forecasting groundwater elevation and predicting well failure." AGU Fall Meeting, 2021.
- **Pauloo, R.A.**, Bostic, D., Monaco, A., and Hammond, K. (2021). gspdrywells.com: An Open-Source Tool to Estimate Impacts to Vulnerable Wells and Support GSP Development. California Water Quality Health Indicators and Data Science Symposium.
- Ahamed, A., Knight, R.J., **Pauloo, R.A.**, Melton, F.S., Wei, Z. (2020). "Development of a Remote-Sensing-Based Method to Monitor Changes in Groundwater Storage." AGU Fall meeting, 2020.
- **Pauloo, R.A.** (2020). calwaterquality.com: Automated Consumer Confidence Reports for streamlined water quality data." California Water Quality Health Indicators and Data Science Symposium.
- Fogg G.E., **Pauloo, R.A.**, and Guo, Z. (2019). "The Existential, Unanticipated Threat of Groundwater Basin Closure." AGU Fall Meeting, 2019.
- **Pauloo, R.A.**, Guo, Z., Henri, C.V., and Fogg G.E. (2019). "Gradient-based Travel Path Dependency of Non-Point Source Contaminant Transport." AGU Fall Meeting, 2019.
- Fogg G.E., **Pauloo, R.A.**, and Guo, Z. (2019). "The Unanticipated Threat of Groundwater Basin Closure on Sustainability." AGU Chapman Conference on the Quest for Sustainability of Heavily Stressed Aquifers at Regional to Global Scales. Valencia, Spain.
- **Pauloo, R.A.**, Guo, Z., Harter, T., and Fogg G.E. (2019). "Groundwater Development Induced Basin Closure: An Unrecognized Threat to Water Quality Sustainability." AGU Chapman Conference on the Quest for Sustainability of Heavily Stressed Aquifers at Regional to Global Scales. Valencia, Spain.
- Ahamed, A., Knight, R., Melton, F.S., **Pauloo, R.A.**, and Wei, Z., (2019). "Remote Sensing-Based Estimation of Groundwater Storage Changes in California's Central Valley." AGU Chapman Conference on the Quest for Sustainability of Heavily Stressed Aquifers at Regional to Global Scales. Valencia, Spain.
- Van Schmidt, N., Wilson, T.S., Flint, L.E., **Pauloo, R.A.**, and Langridge, R. (2019). "Modeling the vulnerability of socio-ecological communities to groundwater shortages during drought at a regional scale." AGU Fall Meeting, 2019.
- **Pauloo, R.A.**, Yoder, A., Calderwood, A., and Fogg G.E. (2018). "Development of a California Groundwater Observatory." Reimagining California Water: UC Water and UCANR Annual Meeting.
- **Pauloo, R.A.**, Guo, Z., Henri, C.V., and Fogg G.E. (2018). "Upscaling Regional, 3D, Non-Fickian Solute Transport with 2D Equivalent Models." AGU Fall Meeting, 2018.
- He, X., Zhan Y., **Pauloo, R.A.**, Zheng, C., Guo, Z., Fogg, G.E. (2018) "Model Comparison and Sensitivity Analysis of Groundwater Salt Balance Calculations in the North China Plain and Tulare Basin, California." AGU Fall Meeting, 2018.
- **Pauloo, R.**, Guo, Z., and Fogg G.E. (2016). "Modeling Effects of Groundwater Basin Closure, and Reversal of Closure, on Groundwater Quality." AGU Fall Meeting, 2017.
- Guo, Z., **Pauloo, R.A.**, Henri, C.V., and Fogg G.E. (2017). "Assessment of applications of transport models on regional scale solute transport." AGU Fall Meeting, 2017.
- Guo, Z., **Pauloo, R.A.**, and Fogg G.E. (2016). "Assessing the groundwater salinization in closed hydrologic basins due to overdraft." AGU Fall Meeting, 2016.
- **Pauloo, R.A.**, Guo, Z., and Fogg G.E. (2016). "The Slow Moving Threat of Groundwater Salinization: Mechanisms, Costs, and Adaptation Strategies." AGU Fall Meeting, 2016.

- **Pauloo, R.A.**, Guo, Z., and Fogg G.E. (2016). "Investigating groundwater sustainability water quality degradation California's Tulare Basin using a Simple Mixing Model." Groundwater Resources Association Annual Meeting.

AWARDS

- Winner, California Water Data Challenge. "gspdrywells.com: forecasted dry wells due to aquifer depletion." 2021. $1,500. (statewide)
- Winner, California Water Data Challenge. "sdwisard: an R package to query the California Drinking Water Information System (SDWIS)." 2021. $1,500. (statewide)
- American Geophysical Union Outstanding Student Presentation Award (AGU OPSA), awarded to the top 2-5% of presenters. 2019. $200. (international)
- Winner, California Water Data Challenge. "calwaterquality.com: automated consumer confidence reports for 2,067 California public water systems." 2019. $1,500. (statewide)
- Winner, California Water Data Challenge. "Central Valley well vulnerability." 2018. $1,500. (statewide)
- NASA Hyperwall Data Visualization and Storytelling Competition at AGU. "Predicting domestic well failure in California with Open Data and Machine Learning." 2018. $1,000. (international)
- NSF-GRFP Honorable Mention. 2016. (national)
- Guardian Professions Program for Former Foster Youth Research Award. $5,000. (university-level)

MEDIA COVERAGE

- PBS (2024). "Weathered: Earth's Extremes – Water Whiplash."
- The Los Angeles Times (2023). "Thousands of California wells are at risk of drying up despite landmark water law."
- Newsweek (2023). "What Will It Take To Get California Completely Out of Drought?"
- The Los Angeles Times (2021). "Despite California groundwater law, aquifers keep dropping in a 'race to the bottom'."
- New Scientist (2021). "Groundwater that supports world food chain may become too salty to use."

OUTREACH, COMMITTEES, AND SERVICE

2020 – 2021	Working Group Chair, California Water Data Consortium (4 hrs/month)
2020 – 2021	Mentored high school students in hydrology data science research (1-2 hrs/week)
2019 – 2020	Co-created the Global Groundwater Statement (https://groundwaterstatement.org), a call to action that gathered more than 1,000 signatories of leading groundwater scientists from ~100 countries (5 hrs/month)
2019 – present	Journal Referee: Water Resources Research, Irrigation Science (adhoc)
2018 – 2020	Affiliate, UC Davis Data Lab (2 hrs/month)
2018 – 2020	Student Mentor, Hydrologic Sciences Graduate Group (1 hr/month)
2016 – 2018	Representative, Hydrologic Sciences Executive Council (1 hr/week)
2016 – 2018	Representative, UC Davis Graduate Council Graduate (1 hr/week)
2015 – 2020	Member, Guardian Professions Program for Former Foster Youth (1 hr/month)

TECHNICAL SKILLS

R, Python, SQL, git, Linux, AWS, MODFLOW, RW3D, ArcGIS, QGIS, Envi, Paraview, Illustrator, LaTeX, AWS, Azure, Google Earth Engine

TEACHING

2020 – 2025	"R for water resources data science" introductory and intermediate courses taught to 300+ water resources engineers, geologists, and environmental scientists since 2020 (128 hrs)
2015 – 2015	Expedition Lead, National Geographic Student Expeditions (Thailand)
2012 – 2015	Environmental Science Educator at NatureBridge, a 501(c)3 (full time job)
2008 – 2008	Teaching Assistant, UC Berkeley Engineering Summer School (summer job)
2008 – 2009	Co-Instructor, After School Engineering Club, West Oakland Middle School (4 hrs/week)
2006 – 2008	Literacy Tutor and Site Director, UC Berkeley Public Service Center, Sylvia Mendez Elementary School (4 hrs/week)