

RICH PAULOO, PHD

I'm a data scientist at LWA and spend most of my time in R automating ETL pipelines for sensor networks , building Shiny Apps and dashboards , designing approaches with spatial statistics and hydrologic models, and generally wrangling lots and lots of data.

I have a PhD in Hydrology and my dissertation is titled '*Emerging consequences of regional-scale aquifer depletion: data-driven and numerical models of well failure, basin salinization, and contaminant transport*' (my exit seminar can be viewed here)¹. Early in my PhD, I found that I really enjoyed data science and programming, and I used these years to sharpen those skills. My published research includes NLP and network analysis², spatial statistics³, and physical modeling of 3D, subsurface contaminant transport⁴.

I'm an #rstats nerd and automation/reproducibility fanatic. My favorite tools include tidyverse (`dplyr`, `ggplot2`, `purrr`), shiny, `flexdashboard`, `plotly`, DT, RMarkdown (for dashboards/reporting), `sf`, `sp`, `raster`, `leaflet` (for spatial data), and DBI for databases. A few projects I'm proud of include an R package to query water quality data ⁵, R data science curriculum ⁶, a dashboard that makes millions of water quality observations understandable ⁷, and a model that predicts the risk of wells going dry ⁸ funded by Microsoft's AI for Earth Grant.



View this CV online with links at richpauloo.com/cv

EDUCATION

2020
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2015

PhD, Hydrogeology

University of California Davis

 Davis, CA

- Published 5 scientific papers (3 first-author), see "Publications".
- Won ~\$153,000 in national, competitive grants and awards from NASA, Microsoft AI for Earth, AGU, and others (see "Grants and Awards").

2011
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2006

B.S., Integrative Biology (minor in Conflict Resolution)

University of California Berkeley

 Berkeley, CA

- Delivered departmental commencement speech⁹ to ~ 5,000 people.



PROFESSIONAL & RESEARCH EXPERIENCE

present
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2020

Data Scientist + Hydrologist

Larry Walker Associates

 Berkeley, CA

- Programmed automated ETL pipelines for ~180 real-time sensor networks and dashboards.
- Managed multiple six-figure contracts, scoped work, contributed to strategic marketing, and trained staff.
- Frequent client communication in diverse groups with competing aims.
- Ad hoc geostatistics, hydrologic modeling, remote sensing.

CONTACT

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-  (415) 275-4981

FOREIGN LANGUAGE SKILLS

Conversational Spanish

LANGUAGE SKILLS

- R
- SQL
- Python
- Bash

Made with [pagedown](#) in R.

The source code is available at github.com/richpauloo/cv.

Last updated on 2021-08-12.

present 2020	Data Scientist + Co-Founder Water Data Lab <ul style="list-style-type: none">• Currently manage \$105k in contracts.• Build ETL pipeline and design strategic approach.• Co-developed r4wrds.com	📍 Remote
2020 2018	Data Engineer UC Water <ul style="list-style-type: none">• Built a data processing pipeline and web dashboard¹⁰ for real-time groundwater data via a wireless sensor network. View paper¹¹.	📍 Davis, CA
2020 2015	Graduate Student Researcher Fogg Lab <ul style="list-style-type: none">• Process large hydrologic datasets, 3D numerical groundwater flow and contaminant transport models, & network optimization models.• Developed novel models of well failure, groundwater salinization, and contaminant transport in porous media.• Regularly use R, Python, Git, Bash, MODFLOW, RW3D, Paraview, Illustrator, AWS, Linux, ArcGIS, Envi, LaTeX.	📍 UC Davis
2019 2018	Data Lab Researcher Computational Institute for Geodynamics (CIG) <ul style="list-style-type: none">• NLP, text mining, and network analysis in R on a corpus of ~600 PDFs.• Developed an R Shiny dashboard¹² to understand the corpus.• Results published here¹³.	📍 UC Davis

🌲 TEACHING & LEADERSHIP EXPERIENCE

2016 2015	Expedition Leader National Geographic & Adventures Cross Country <ul style="list-style-type: none">• Coordinated all aspects of multi-week international travel.• Facilitated teambuilding, group dynamics, and cultural integration.	📍 Thailand
2015 2013	Site Manager & Educator/Guide NatureBridge <ul style="list-style-type: none">• Coordinated with Operations to run a 200-student, 60 employee campus, which involved frequent public speaking.• Lived and worked with a close team.• Trained in wilderness guiding and backcountry safety.• Served as primary liaison between the organization and clients.	📍 Yosemite & the Marin Headlands, CA

Before pursuing my PhD, I spent 3 years teaching diverse audiences in environmental education. I worked in Yosemite, Thailand and the Marin Headlands, and honed skills in public speaking, interpersonal team development, group facilitation, and critical listening. Living with my coworkers in tight teams taught me patience and cooperation. During summers I guided expeditions in the wilderness and abroad with National Geographic.

2013
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2012

Environmental Science Educator

San Mateo County Office of Education

📍 La Honda, CA

- Designed curriculum & taught science to diverse students.
- Worked and lived with a close team of educators.
- Frequent improvisational public speaking to large audiences.



GRANTS AND AWARDS

2020

Microsoft AI for Earth (national)

\$37,571

- gspdrywells.com¹⁴, AI-enabled forecasting of domestic well failure.

2019

AGU Outstanding Student Presentation (national)

\$200 and free 2020 registration

- Awarded to the top 3-5% of presenters. View presentation¹⁵.

2019

2019 California Water Data Challenge (statewide)

\$1,500

- Created calwaterquality.com¹⁶, a statewide data portal that integrates and visualizes massive water quality data sets, and auto-generates water quality reports for more than 2,000 California public water systems.
- Blog post¹⁷ about the project summarizing my motivation.

2018

NASA Data Visualization Competition (national)

\$1,400

- Machine learning for domestic well failure¹⁸.

2018

2018 California Water Data Challenge (statewide)

\$1,500

- Used large state databases to build and calibrate a predictive model¹⁹ of domestic well failure in California's Central Valley.

2016

NSF-GRFP Honorable Mention (national)

2015

NSF-IGERT in Climate Change, Water and Society (national)

\$111,000

SELECTED PUBLICATIONS, POSTERS, AND TALKS

2021	Mean flow direction modulates non-Fickian transport in a heterogeneous alluvial aquifer-aquitard system²⁰ Water Resources Research, 10.1029/2020WR028655 · Pauloo, R. & Fogg, G.E. & Guo, Z. & Harter, T.
2020	Development of a remote sensing based method to estimate changes in groundwater storage Water Resources Research (in review) · Ahmed, A. & Pauloo, R. & Knight, R. & Melton, F.
2020	A low cost, open source wireless sensor network for real-time groundwater monitoring²¹ Water, 10.3390/w12041066 · Calderwood, A. & Pauloo, R. & Yoder, A. & Fogg, G.E.
2020	Domestic Well Vulnerability to Drought Duration and Unsustainable Groundwater Management in California's Central Valley²² Environmental Research Letters, 10.1088/1748-9326/ab6f10 · Pauloo, R. & Dahlke, H. & Escriva-Bou, A. & Fencl, A. & Guillou, H. & Fogg, G.E.
2020	Anthropogenic Basin Closure and Groundwater SALinization (ABCSAL)²³ Journal of Hydrology, 10.1016/j.jhydrol.2020.125787 · Pauloo, R. & Fogg, G.E. & Guo, Z. & Harter, T.
2019	Assessing Impact of Outreach through Software Citation for Community Software in Geodynamics²⁴ Computing in Science & Engineering, 10.1109/MCSE.2019.2940221 · Hwang, L. & Pauloo, R. & Carlen, J.
2019	Show me the Data²⁵ California Water Data Summit 📍 Davis, CA · Pauloo, R.
2019	An Overview of Domestic Well Vulnerability in California's Central Valley: Opportunities for Informed Risk Assessment²⁶ California Environmental Protection Agency 📍 Sacramento, CA · Pauloo, R.
2019	Hydraulic gradients modulate non-Fickian transport in heterogeneous porous media²⁷ American Geophysical Union 📍 San Francisco, CA · Pauloo, R. & Fogg, G.E. & Guo, Z. & Henri, C.V.

2019	Anthropogenic Basin Closure and Groundwater Salinization²⁸ Chapman Conference on Aquifer Sustainability · Pauloo, R. & Fogg, G.E. & Guo, Z. & Harter, T.	📍 Valencia, Spain
2018	An Interactive Mapping Interface to the California Online State Well Completion Report Database²⁹ UC Water Annual Meeting · Pauloo, R.	📍 Sacramento, CA
2015	The Past Present and Future: Long-term climate trends and water management history in California³⁰ Water Scarcity in the West · Pauloo, R. & Pinheiro, M.	📍 Davis, CA

↗ SELECTED DATA SCIENCE WRITING

2020	Install RStudio Server on Microsoft Azure³¹	
2020	Automating R scripts on Linux with cron³²	
2019	Using Twilio to Text Myself After Long Running Jobs³³	
2019	Race to the Bottom³⁴ Exploratory data analysis and science journalism California well construction trends.	
2019	Text Analysis of the Mueller Report³⁵ Text mining and sentiment analysis.	
2018	Installing the R kernel in Jupyter Lab³⁶ How-to guide visited ~2,000 times per month.	
2018	Tidy Chi Squared stats in infer³⁷	View all of my blog posts here.

★ CERTIFICATIONS

Wilderness First Responder

📍 National Outdoor Leadership School

🔗 LINKS

- 1: my exit seminar can be viewed here]<https://www.richpauloo.com/talk/2020-exit-seminar/>
- 2: <https://www.richpauloo.com/publication/cig/>
- 3: <https://www.richpauloo.com/publication/well-failure/>
- 4: <https://www.richpauloo.com/publication/vhgr/>
- 5: <https://caopenwater.github.io/sdwisard/>
- 6: <https://r4wrds.com/>
- 7: <http://calwaterquality.com/>
- 8: <https://www.gspdrywells.com/>
- 9: <https://www.youtube.com/watch?v=vBnvVL6XQTw&t=2s>
- 10: <https://www.richpauloo.com/project/lcsn/>
- 11: <https://doi.org/10.3390/w12041066>
- 12: https://richpauloo.shinyapps.io/cig_nlp
- 13: <https://ieeexplore.ieee.org/document/8827910>
- 14: <https://www.gspdrywells.com>
- 15: <https://www.richpauloo.com/talk/2019-agu/>
- 16: <http://calwaterquality.com>
- 17: <https://www.richpauloo.com/post/cawdc-2019/>
- 18: <https://www.richpauloo.com/talk/2018-nasa/>
- 19: <https://www.richpauloo.com/publication/well-failure/>
- 20: <https://www.richpauloo.com/publication/vhgr/>
- 21: <https://www.richpauloo.com/publication/lcsn/>
- 22: <https://www.richpauloo.com/publication/well-failure/>
- 23: ABCSAL]<https://www.richpauloo.com/publication/abcsal/>
- 24: <https://www.richpauloo.com/publication/cig/>
- 25: <https://www.richpauloo.com/talk/2019-water-data-summit/>
- 26: <https://www.richpauloo.com/talk/2019-cal-epa/>
- 27: <https://www.richpauloo.com/talk/2019-agu/>
- 28: <https://www.richpauloo.com/publication/abcsal/>
- 29: <https://shiny.lawr.ucdavis.edu/shiny/oswcrd/>
- 30: <https://speakerdeck.com/richpauloo/weathering-change>
- 31: <https://www.richpauloo.com/post/azure/>
- 32: <https://www.richpauloo.com/post/crontabs/>
- 33: <https://www.richpauloo.com/post/textme/>
- 34: <https://www.richpauloo.com/post/race-to-the-bottom/>
- 35: <https://www.richpauloo.com/post/mueller/>
- 36: <https://www.richpauloo.com/post/jupyter/>
- 37: <https://www.richpauloo.com/post/infer/>