

RICH PAULOO, PHD

I'm a data scientist with a background in physical science (hydrology, fluid mechanics, geology, statistical methods, optimization, geospatial science), computing (sensor networks, cloud computing, open source software development), and physics (mathematical and numerical modeling, contaminant transport).

I have coded workflows to automate ETL jobs from hundreds of remote sensor networks¹; built dashboards and interactive data visualizations to bring clarity to datasets with millions of observations²; created 3D numerical physical simulation models of groundwater flow and contaminant transport³; explored ways to improve machine learning interpretability⁴; built R packages⁵; won an AI for Earth Grant to model the risk of domestic wells going dry in California's Central Valley⁶; and developed R data science curriculum⁷.



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 speech⁸ to ~5,000 people.

PROFESSIONAL & RESEARCH EXPERIENCE

present
|
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.

present
|
2020

Data Scientist + Co-Founder

Water Data Lab

📍 Remote

- Currently manage \$105k in contracts.
- Build ETL pipeline and design strategic approach.
- Co-developed r4wrds.com

FOREIGN LANGUAGE SKILLS

Conversational Spanish

LANGUAGE SKILLS

R

SQL

Python

Bash

JS/HTML/CSS

Made with [pagedown](#) in R.

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

Last updated on 2021-08-05.

2020
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2018

Data Engineer

UC Water

📍 Davis, CA

- Built a data processing pipeline and web dashboard⁹ for real-time groundwater data via a wireless sensor network. View paper¹⁰.

2020
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2015

Graduate Student Researcher

Fogg Lab

📍 UC Davis

- 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.

2019
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2018

Data Lab Researcher

Computational Institute for Geodynamics (CIG)

📍 UC Davis

- NLP, text mining, and network analysis in R on a corpus of ~600 PDFs.
- Developed an R Shiny dashboard¹¹ to understand the corpus.
- Results published here¹².



TEACHING & LEADERSHIP EXPERIENCE

2016
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2015

Expedition Leader

National Geographic & Adventures Cross Country

📍 Thailand

- Coordinated all aspects of multi-week international travel.
- Facilitated teambuilding, group dynamics, and cultural integration.

2015
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2013

Site Manager & Educator/Guide

NatureBridge

📍 Yosemite & the Marin Headlands, CA

2013
|
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.

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.

GRANTS AND AWARDS

2020	Microsoft AI for Earth (national) \$37,571 · gspdrywells.com ¹³ , 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 presentation ¹⁴ .
2019	2019 California Water Data Challenge (statewide) \$1,500 · Created calwaterquality.com ¹⁵ , 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 post ¹⁶ about the project summarizing my motivation.
2018	NASA Data Visualization Competition (national) \$1,400 · Machine learning for domestic well failure ¹⁷ .
2018	2018 California Water Data Challenge (statewide) \$1,500 · Used large state databases to build and calibrate a predictive model ¹⁸ 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 system¹⁹ 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 monitoring²⁰ 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 Valley²¹ Environmental Research Letters, 10.1088/1748-9326/ab6f10 · Pauloo, R. & Dahlke, H. & Escriva-Bou, A. & Fencl, A. & Guillon, H. & Fogg, G.E.
2020	Anthropogenic Basin Closure and Groundwater SALinization (ABCSAL)²² 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 Geodynamics²³ Computing in Science & Engineering, 10.1109/MCSE.2019.2940221 · Hwang, L. & Pauloo, R. & Carlen, J.
2019	Show me the Data²⁴ California Water Data Summit 📍 Davis, CA · Pauloo, R.
2019	An Overview of Domestic Well Vulnerability in California's Central Valley: Opportunities for Informed Risk Assessment²⁵ California Environmental Protection Agency 📍 Sacramento, CA · Pauloo, R.
2019	Hydraulic gradients modulate non-Fickian transport in heterogeneous porous media²⁶ American Geophysical Union 📍 San Francisco, CA · Pauloo, R. & Fogg, G.E. & Guo, Z. & Henri, C.V.
2019	Anthropogenic Basin Closure and Groundwater Salinization²⁷ Chapman Conference on Aquifer Sustainability 📍 Valencia, Spain · Pauloo, R. & Fogg, G.E. & Guo, Z. & Harter, T.
2018	An Interactive Mapping Interface to the California Online State Well Completion Report Database²⁸ UC Water Annual Meeting 📍 Sacramento, CA · Pauloo, R.

2015

The Past Present and Future: Long-term climate trends and water management history in California²⁹

Water Scarcity in the West

 Davis, CA

• Pauloo, R. & Pinheiro, M.

SELECTED DATA SCIENCE WRITING

2020

Install RStudio Server on Microsoft Azure³⁰

2020

Automating R scripts on Linux with cron³¹

2019

Using Twilio to Text Myself After Long Running Jobs³²

2019

Race to the Bottom³³

Exploratory data analysis and science journalism California well construction trends.

2019

Text Analysis of the Mueller Report³⁴

Text mining and sentiment analysis.

2018

Installing the R kernel in Jupyter Lab³⁵

How-to guide visited ~2,000 times per month.

2018

Tidy Chi Squared stats in infer³⁶

[View all of my blog posts here.](#)

CERTIFICATIONS

Wilderness First Responder

 National Outdoor Leadership School

Software Carpentry Instructor

 Software Carpentry

LINKS

- 1: <https://www.richpauloo.com/project/lcsn/>
- 2: <http://calwaterquality.com/>
- 3: <https://www.richpauloo.com/publication/vhgr/>
- 4: <https://twitter.com/RichPauloo/status/1124470765095538688>
- 5: <https://github.com/richpauloo/textme>
- 6: <https://www.gspdrywells.com/>
- 7: <https://r4wrds.com/>
- 8: <https://www.youtube.com/watch?v=vBnvVL6XQTw&t=2s>
- 9: <https://www.richpauloo.com/project/lcsn/>
- 10: <https://doi.org/10.3390/w12041066>
- 11: https://richpauloo.shinyapps.io/cig_nlp
- 12: <https://ieeexplore.ieee.org/document/8827910>
- 13: <https://www.gspdrywells.com>
- 14: <https://www.richpauloo.com/talk/2019-agu/>
- 15: <http://calwaterquality.com>
- 16: <https://www.richpauloo.com/post/cawdc-2019/>
- 17: <https://www.richpauloo.com/talk/2018-nasa/>
- 18: <https://www.richpauloo.com/publication/well-failure/>
- 19: <https://www.richpauloo.com/publication/vhgr/>
- 20: <https://www.richpauloo.com/publication/lcsn/>
- 21: <https://www.richpauloo.com/publication/well-failure/>
- 22: ABCSAL]<https://www.richpauloo.com/publication/abcsal/>
- 23: <https://www.richpauloo.com/publication/cig/>
- 24: <https://www.richpauloo.com/talk/2019-water-data-summit/>
- 25: <https://www.richpauloo.com/talk/2019-cal-epa/>
- 26: <https://www.richpauloo.com/talk/2019-agu/>
- 27: <https://www.richpauloo.com/publication/abcsal/>
- 28: <https://shiny.lawr.ucdavis.edu/shiny/oswcrd/>
- 29: <https://speakerdeck.com/richpauloo/weathering-change>
- 30: <https://www.richpauloo.com/post/azure/>
- 31: <https://www.richpauloo.com/post/crontabs/>
- 32: <https://www.richpauloo.com/post/textme/>
- 33: <https://www.richpauloo.com/post/race-to-the-bottom/>
- 34: <https://www.richpauloo.com/post/mueller/>
- 35: <https://www.richpauloo.com/post/jupyter/>
- 36: <https://www.richpauloo.com/post/infer/>