

RICH PAULOO

I'm a hydrogeologist and data scientist developing scientific methods to monitor, model, and manage regional-scale aquifers, with applications in sustainable groundwater management, agricultural water use, and real-time natural resource monitoring.

My background is in physical science (earth science, statistical methods, optimization, mapping), computing (sensor networks, the cloud, open source software development), and physics (mathematical and numerical modeling, contaminant transport).

I have coded workflows that stream real-time data from remote sensor networks¹, built dashboards to bring clarity to massive datasets², developed physical simulation models of groundwater flow and contaminant transport³, made visualizations to improve machine learning interpretability⁴, and built R packages⁵.



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

- 3D physical simulation of groundwater flow & solute transport.
- NSF fellow in Climate Change, Water, and Society IGERT.
- Elected Graduate Student Assembly representative.
- Built gspdrywells.com⁶, funded by Microsoft AI for Earth.

2011
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2006

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

University of California Berkeley

📍 Berkeley, CA

- Delivered departmental commencement speech⁷ to ~ 5,000 people.

💻 PROFESSIONAL & RESEARCH EXPERIENCE

present
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2020

● Hydrogeologist

Larry Walker Associates

📍 Berkeley, CA

- Hydrologic science, programming ETL pipelines for real-time sensor networks and dashboards, ad hoc geostatistics, remote sensing.
- Project management, stakeholder outreach and communication, workplan development.

2020
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2018

● Data Engineer

UC Water

📍 Davis, CA

- Built a data processing pipeline and web dashboard⁸ for real-time groundwater data via a wireless sensor network. View paper⁹.

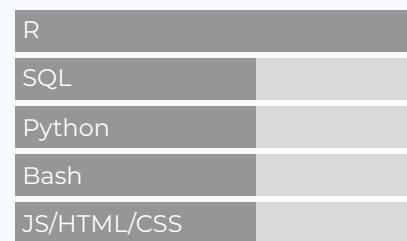
CONTACT

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FOREIGN LANGUAGE SKILLS

Conversational Spanish

LANGUAGE SKILLS



Made with [pagedown](#) in R.

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

Last updated on 2021-02-03.

2020
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2015

- **Graduate Student Researcher**
Fogg Lab 📍 UC Davis
 - Work with large hydrologic datasets, 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.
- **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 dashboard¹⁰ to understand the corpus.
 - Results published here¹¹.
- **Research Assistant**
Fine Lab 📍 UC Berkeley
 - Experimental design, data collection, data analysis, and writing of a report on invasive plant species in Berkeley's Strawberry Canyon.
- **Biological Research Assistant**
Rizzo Lab 📍 UC Davis
 - Collected and managed field data to study intersection of fire, drought, and Phytophthora ramorum, the Sudden Oak Death agent.
- **Biological Research Assistant**
Sinervo Lab 📍 UC Santa Cruz
 - Backpacked to remote alpine field sites to deploy temperature sensors, and study climate change impacts to on the American pika.
 - Identified & selected high-alpine field survey sites via satellite imagery.

2019
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2018

🌲 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.
- **Site Manager & Educator/Guide**
NatureBridge 📍 Yosemite & the Marin Headlands, CA
 - 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.

2015
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2013

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.com¹², 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 presentation¹³.
- 2019 ● **2019 California Water Data Challenge (statewide)**
\$1,500
 - Created calwaterquality.com¹⁴, 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 post¹⁵ about the project summarizing my motivation.
- 2018 ● **NASA Data Visualization Competition (national)**
\$1,400
 - Machine learning for domestic well failure¹⁶.
- 2018 ● **2018 California Water Data Challenge (statewide)**
\$1,500
 - Used large state databases to build and calibrate a predictive model¹⁷ 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 system¹⁸**
Water Resources Research (accepted manuscript)
· 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 monitoring¹⁹**
[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 Valley²⁰**
[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)²¹**
[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 Geodynamics²²**
[Computing in Science & Engineering, 10.1109/MCSE.2019.2940221](#)
· Hwang, L. & Pauloo, R. & Carlen, J.
- 2019 ● **Show me the Data²³**
California Water Data Summit 📍 Davis, CA
· Pauloo, R.
- 2019 ● **An Overview of Domestic Well Vulnerability in California's Central Valley: Opportunities for Informed Risk Assessment²⁴**
California Environmental Protection Agency 📍 Sacramento, CA
· Pauloo, R.
- 2019 ● **Hydraulic gradients modulate non-Fickian transport in heterogeneous porous media²⁵**
American Geophysical Union 📍 San Francisco, CA
· Pauloo, R. & Fogg, G.E. & Guo, Z. & Henri, C.V.

- 2019
- **Anthropogenic Basin Closure and Groundwater Salinization²⁶**
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 Database²⁷**
UC Water Annual Meeting 📍 Sacramento, CA
· Pauloo, R.
- 2015
- **The Past Present and Future: Long-term climate trends and water management history in California²⁸**
Water Scarcity in the West 📍 Davis, CA
· Pauloo, R. & Pinheiro, M.

↗ SELECTED DATA SCIENCE WRITING

- 2020
- **Install RStudio Server on Microsoft Azure²⁹**
- 2020
- **Automating R scripts on Linux with cron³⁰**
- 2019
- **Using Twilio to Text Myself After Long Running Jobs³¹**
- 2019
- **Race to the Bottom³²**
Exploratory data analysis and science journalism California well construction trends.
- 2019
- **Text Analysis of the Mueller Report³³**
Text mining and sentiment analysis.
- 2018
- **Installing the R kernel in Jupyter Lab³⁴**
How-to guide visited ~2,000 times per month.
- 2018
- **Tidy Chi Squared stats in infer³⁵**

I regularly write about data science, visualization, machine learning, and hydrology on [my blog](#).

★ 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://www.youtube.com/watch?v=vBnvVL6XQTw&t=2s>
- 8: <https://www.richpauloo.com/project/lcsn/>
- 9: <https://doi.org/10.3390/w12041066>
- 10: https://richpauloo.shinyapps.io/cig_nlp
- 11: <https://ieeexplore.ieee.org/document/8827910>
- 12: <https://www.gspdrywells.com>
- 13: <https://www.richpauloo.com/talk/2019-agu/>
- 14: <http://calwaterquality.com>
- 15: <https://www.richpauloo.com/post/cawdc-2019/>
- 16: <https://www.richpauloo.com/talk/2018-nasa/>
- 17: <https://www.richpauloo.com/publication/well-failure/>
- 18: <https://www.essoar.org/doi/10.1002/essoar.10504200.1>
- 19: <https://www.richpauloo.com/publication/lcsn/>
- 20: <https://www.richpauloo.com/publication/well-failure/>
- 21: ABCSAL] <https://www.richpauloo.com/publication/abcsal/>
- 22: <https://www.richpauloo.com/publication/cig/>
- 23: <https://www.richpauloo.com/talk/2019-water-data-summit/>
- 24: <https://www.richpauloo.com/talk/2019-cal-epa/>
- 25: <https://www.richpauloo.com/talk/2019-agu/>
- 26: <https://www.richpauloo.com/publication/abcsal/>
- 27: <https://shiny.lawr.ucdavis.edu/shiny/oswcrd/>
- 28: <https://speakerdeck.com/richpauloo/weathering-change>
- 29: <https://www.richpauloo.com/post/azure/>
- 30: <https://www.richpauloo.com/post/crontabs/>
- 31: <https://www.richpauloo.com/post/textme/>
- 32: <https://www.richpauloo.com/post/race-to-the-bottom/>
- 33: <https://www.richpauloo.com/post/mueller/>
- 34: <https://www.richpauloo.com/post/jupyter/>
- 35: <https://www.richpauloo.com/post/infer/>