

# RICH PAULOO

I am a hydrogeologist and data scientist with a background in numerical modeling of subsurface contaminant transport. My interests bridge hydrogeology, sustainability, and the role of technology in advancing water resources science and management.

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

I have coded workflows that stream real-time data from remote sensor networks<sup>1</sup>, built dashboards to bring clarity to massive datasets<sup>2</sup>, developed physical simulation models of groundwater flow and contaminant transport<sup>3</sup>, made visualizations to improve machine learning interpretability<sup>4</sup>, and built R packages<sup>5</sup>.



View this CV online with links at [richpauloo.com/cv](http://richpauloo.com/cv)

## EDUCATION

- |                   |  |
|-------------------|--|
| 2020<br> <br>2015 | <ul style="list-style-type: none"><li>● <b>PhD, Hydrogeology</b><br/>University of California Davis <span style="float: right;">📍 Davis, CA</span><ul style="list-style-type: none"><li>• 3D physical simulation of groundwater flow &amp; solute transport.</li><li>• NSF fellow in Climate Change, Water, and Society IGERT.</li><li>• Elected Graduate Student Assembly representative.</li><li>• Built groundwaterstatement.org<sup>6</sup>, signed by over 1,000 groundwater experts worldwide.</li></ul></li></ul> |
| 2011<br> <br>2006 | <ul style="list-style-type: none"><li>● <b>B.S., Integrative Biology (minor in Conflict Resolution)</b><br/>University of California Berkeley <span style="float: right;">📍 Berkeley, CA</span><ul style="list-style-type: none"><li>• Delivered departmental commencement speech<sup>7</sup> to ~ 5,000 people.</li></ul></li></ul>   |

## PROFESSIONAL & RESEARCH EXPERIENCE

- |                      |   |
|----------------------|---|
| present<br> <br>2020 | <ul style="list-style-type: none"><li>● <b>Hydrogeologist</b><br/>Larry Walker Associates <span style="float: right;">📍 Berkeley, CA</span><ul style="list-style-type: none"><li>• Project management, stakeholder outreach and communication, work-plan development.</li><li>• Hydrologic data science, programming to support real-time sensor networks and dashboards, ad hoc scientific analysis.</li></ul></li></ul> |
| 2020<br> <br>2018    | <ul style="list-style-type: none"><li>● <b>Data Engineer</b><br/>UC Water <span style="float: right;">📍 Davis, CA</span><ul style="list-style-type: none"><li>• Built a data processing pipeline and web dashboard<sup>8</sup> for real-time groundwater data via a wireless sensor network. View paper<sup>9</sup>.</li></ul></li></ul>  |

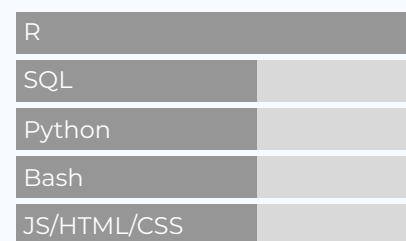
## CONTACT

- ✉ richpauloo@gmail.com
- 🐦 RichPauloo
- 🔗 [github.com/richpauloo](https://github.com/richpauloo)
- 🔗 [richpauloo.com](http://richpauloo.com)
- 📞 (415) 275-4981

## FOREIGN LANGUAGE SKILLS

Conversational Spanish

## LANGUAGE SKILLS



Made with [pagedown](#) in R.

The source code is available at [github.com/richpauloo/cv](https://github.com/richpauloo/cv).

Last updated on 2020-12-14.

2020  
|  
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 dashboard<sup>10</sup> to understand the corpus.
  - Results published here<sup>11</sup>.
- **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  
|  
2018

## 🌲 TEACHING & LEADERSHIP EXPERIENCE

2016  
|  
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  
|  
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  
|  
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

- 2019 ● **Microsoft AI for Earth (national)**  
\$37,571
  - 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<sup>12</sup>.
- 2019 ● **2019 California Water Data Challenge (statewide)**  
\$1,500
  - Created calwaterquality.com<sup>13</sup>, 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<sup>14</sup> about the project summarizing my motivation.
- 2018 ● **NASA Data Visualization Competition (national)**  
\$1,400
  - Machine learning for domestic well failure<sup>15</sup>.
- 2018 ● **2018 California Water Data Challenge (statewide)**  
\$1,500
  - Used large state databases to build and calibrate a predictive model<sup>16</sup> 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

- 2020 ● **Mean flow direction modulates non-Fickian transport in a heterogeneous alluvial aquifer-aquitard system<sup>17</sup>**  
Water Resources Research (in review)  
· 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 monitoring<sup>18</sup>**  
[Water, 10.3390/w12041066](https://doi.org/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 Valley<sup>19</sup>**  
[Environmental Research Letters, 10.1088/1748-9326/ab6f10](https://doi.org/10.1088/1748-9326/ab6f10)  
· Pauloo, R. & Dahlke, H. & Escriva-Bou, A. & Fencl, A. & Guillou, H. & Fogg, G.E.
- 2019 ● **Assessing Impact of Outreach through Software Citation for Community Software in Geodynamics<sup>20</sup>**  
[Computing in Science & Engineering, 10.1109/MCSE.2019.2940221](https://doi.org/10.1109/MCSE.2019.2940221)  
· Hwang, L. & Pauloo, R. & Carlen, J.
- 2019 ● **Anthropogenic Basin Closure and Groundwater SALinization (ABCSAL)<sup>21</sup>**  
[Journal of Hydrology, 10.1016/j.jhydrol.2020.125787](https://doi.org/10.1016/j.jhydrol.2020.125787)  
· Pauloo, R. & Fogg, G.E. & Guo, Z. & Harter, T.
- 2019 ● **Show me the Data<sup>22</sup>**  
California Water Data Summit 📍 Davis, CA  
· Pauloo, R.
- 2019 ● **An Overview of Domestic Well Vulnerability in California's Central Valley: Opportunities for Informed Risk Assessment<sup>23</sup>**  
California Environmental Protection Agency 📍 Sacramento, CA  
· Pauloo, R.
- 2019 ● **Hydraulic gradients modulate non-Fickian transport in heterogeneous porous media<sup>24</sup>**  
American Geophysical Union 📍 San Francisco, CA  
· Pauloo, R. & Fogg, G.E. & Guo, Z. & Henri, C.V.

- 2019 ● **Anthropogenic Basin Closure and Groundwater Salinization<sup>25</sup>**  
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 Database<sup>26</sup>**  
UC Water Annual Meeting     📍 Sacramento, CA  
· Pauloo, R.
- 2015 ● **The Past Present and Future: Long-term climate trends and water management history in California<sup>27</sup>**  
Water Scarcity in the West     📍 Davis, CA  
· Pauloo, R. & Pinheiro, M.

## ↗ SELECTED DATA SCIENCE WRITING

- 2019 ● **Using Twilio to Text Myself After Long Running Jobs<sup>28</sup>**
- 2019 ● **Race to the Bottom<sup>29</sup>**  
Exploratory data analysis and science journalism California well construction trends.
- 2019 ● **Text Analysis of the Mueller Report<sup>30</sup>**  
Text mining and sentiment analysis.
- 2018 ● **Installing the R kernel in Jupyter Lab<sup>31</sup>**  
How-to guide visited ~2,000 times per month.
- 2018 ● **Tidy Chi Squared stats in infer<sup>32</sup>**

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.groundwaterstatement.org>
- 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](https://richpauloo.shinyapps.io/cig_nlp)
- 11: <https://ieeexplore.ieee.org/document/8827910>
- 12: <https://www.richpauloo.com/talk/2019-agu/>
- 13: <http://calwaterquality.com>
- 14: <https://www.richpauloo.com/post/cawdc-2019/>
- 15: <https://www.richpauloo.com/talk/2018-nasa/>
- 16: <https://www.richpauloo.com/publication/well-failure/>
- 17: <https://www.essoar.org/doi/10.1002/essoar.10504200.1>
- 18: <https://www.richpauloo.com/publication/lcsn/>
- 19: <https://www.richpauloo.com/publication/well-failure/>
- 20: <https://www.richpauloo.com/publication/cig/>
- 21: ABCSAL]https://www.richpauloo.com/publication/abcsal/
- 22: <https://www.richpauloo.com/talk/2019-water-data-summit/>
- 23: <https://www.richpauloo.com/talk/2019-cal-epa/>
- 24: <https://www.richpauloo.com/talk/2019-agu/>
- 25: <https://www.richpauloo.com/publication/abcsal/>
- 26: <https://shiny.lawr.ucdavis.edu/shiny/oswcrd/>
- 27: <https://speakerdeck.com/richpauloo/weathering-change>
- 28: <https://www.richpauloo.com/post/textme/>
- 29: <https://www.richpauloo.com/post/race-to-the-bottom/>
- 30: <https://www.richpauloo.com/post/mueller/>
- 31: <https://www.richpauloo.com/post/jupyter/>
- 32: <https://www.richpauloo.com/post/infer/>