

# RICH PAULOO, PHD

I'm a hydrogeologist and data scientist with a background in physical science (geology, fluid mechanics, 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 that automate real-time data streaming from hundreds of remote sensor networks<sup>1</sup>; built dashboards and interactive data visualizations to bring clarity to datasets with millions of observations<sup>2</sup>; created 3D numerical physical simulation models of groundwater flow and contaminant transport<sup>3</sup>; made animations to improve machine learning interpretability<sup>4</sup>; built multiple R packages<sup>5</sup>; won an AI for Earth Grant to create a web tool to communicate complex model results<sup>6</sup>; and I'm currently writing R data science curriculum<sup>7</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>• Published 5 scientific papers (3 first-author), see "Publications".</li><li>• Won ~\$153,000 in national, competitive grants and awards from NASA, Microsoft AI for Earth, AGU, and others (see "Grants and Awards").</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>8</sup> to ~ 5,000 people.</li></ul></li></ul>  |

## PROFESSIONAL & RESEARCH EXPERIENCE

- |                      |   |
|----------------------|---|
| present<br> <br>2020 | <ul style="list-style-type: none"><li>● <b>Project Scientist</b><br/>Larry Walker Associates <span style="float: right;">📍 Berkeley, CA</span><ul style="list-style-type: none"><li>• Programmed automated ETL pipelines for ~180 real-time sensor networks and dashboards.</li><li>• Project management and workplan development, stakeholder outreach and communication in diverse groups with often competing aims.</li><li>• Ad hoc geostatistics, hydrologic modeling, remote sensing.</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>9</sup> for real-time groundwater data via a wireless sensor network. View paper<sup>10</sup>.</li></ul></li></ul>   |

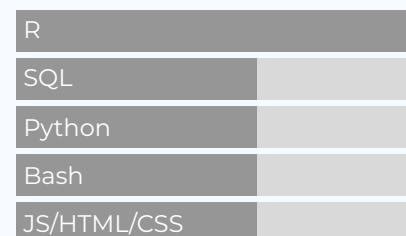
## CONTACT

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- 📞 (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 2021-04-14.

2020  
|  
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.
  
- **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>11</sup> to understand the corpus.
  - Results published here<sup>12</sup>.

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.
  
- **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.

2015  
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2013

2013  
|  
2012

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<sup>13</sup>, AI-enabled forecasting of domestic well failure.

2019	<ul style="list-style-type: none"> <li>● <b>AGU Outstanding Student Presentation (national)</b> \$200 and free 2020 registration           <ul style="list-style-type: none"> <li>• Awarded to the top 3-5% of presenters. View presentation<sup>14</sup>.</li> </ul> </li> </ul>
2019	<ul style="list-style-type: none"> <li>● <b>2019 California Water Data Challenge (statewide)</b> \$1,500           <ul style="list-style-type: none"> <li>• Created calwaterquality.com<sup>15</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.</li> <li>• Blog post<sup>16</sup> about the project summarizing my motivation.</li> </ul> </li> </ul>
2018	<ul style="list-style-type: none"> <li>● <b>NASA Data Visualization Competition (national)</b> \$1,400           <ul style="list-style-type: none"> <li>• Machine learning for domestic well failure<sup>17</sup>.</li> </ul> </li> </ul>
2018	<ul style="list-style-type: none"> <li>● <b>2018 California Water Data Challenge (statewide)</b> \$1,500           <ul style="list-style-type: none"> <li>• Used large state databases to build and calibrate a predictive model<sup>18</sup> of domestic well failure in California's Central Valley.</li> </ul> </li> </ul>
2016	<ul style="list-style-type: none"> <li>● <b>NSF-GRFP Honorable Mention (national)</b></li> </ul>
2015	<ul style="list-style-type: none"> <li>● <b>NSF-IGERT in Climate Change, Water and Society (national)</b> \$111,000</li> </ul>

## ≡ SELECTED PUBLICATIONS, POSTERS, AND TALKS

2021	<ul style="list-style-type: none"> <li>● <b>Mean flow direction modulates non-Fickian transport in a heterogeneous alluvial aquifer-aquitard system<sup>19</sup></b>  <em>Water Resources Research</em>, <a href="https://doi.org/10.1029/2020WR028655">10.1029/2020WR028655</a> <ul style="list-style-type: none"> <li>• Paulloo, R. &amp; Fogg, G.E. &amp; Guo, Z. &amp; Harter, T.</li> </ul> </li> </ul>
2020	<ul style="list-style-type: none"> <li>● <b>Development of a remote sensing based method to estimate changes in groundwater storage</b>  <em>Water Resources Research</em> (in review)           <ul style="list-style-type: none"> <li>• Ahmed, A. &amp; Paulloo, R. &amp; Knight, R. &amp; Melton, F.</li> </ul> </li> </ul>
2020	<ul style="list-style-type: none"> <li>● <b>A low cost, open source wireless sensor network for real-time groundwater monitoring<sup>20</sup></b>  <em>Water</em>, <a href="https://doi.org/10.3390/w12041066">10.3390/w12041066</a> <ul style="list-style-type: none"> <li>• Calderwood, A. &amp; Paulloo, R. &amp; Yoder, A. &amp; Fogg, G.E.</li> </ul> </li> </ul>

- 2020 ● **Domestic Well Vulnerability to Drought Duration and Unsustainable Groundwater Management in California's Central Valley<sup>21</sup>**  
[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)<sup>22</sup>**  
[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 Geodynamics<sup>23</sup>**  
[Computing in Science & Engineering, 10.1109/MCSE.2019.2940221](#)  
· Hwang, L. & Pauloo, R. & Carlen, J.
- 2019 ● **Show me the Data<sup>24</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>25</sup>**  
California Environmental Protection Agency  Sacramento, CA  
· Pauloo, R.
- 2019 ● **Hydraulic gradients modulate non-Fickian transport in heterogeneous porous media<sup>26</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>27</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>28</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>29</sup>**  
Water Scarcity in the West  Davis, CA  
· Pauloo, R. & Pinheiro, M.

## SELECTED DATA SCIENCE WRITING

- 2020   ● **Install RStudio Server on Microsoft Azure<sup>30</sup>**
- 2020   ● **Automating R scripts on Linux with cron<sup>31</sup>**
- 2019   ● **Using Twilio to Text Myself After Long Running Jobs<sup>32</sup>**
- 2019   ● **Race to the Bottom<sup>33</sup>**  
Exploratory data analysis and science journalism California well construction trends.
- 2019   ● **Text Analysis of the Mueller Report<sup>34</sup>**  
Text mining and sentiment analysis.
- 2018   ● **Installing the R kernel in Jupyter Lab<sup>35</sup>**  
How-to guide visited ~2,000 times per month.
- 2018   ● **Tidy Chi Squared stats in infer<sup>36</sup>**

[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/intro/index.html>
- 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](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/>