J Michael **Johnson**

GEOGRAPHER | DATA SCIENTIST | WATER RESOURCES

Fort Collins, Colorado

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As a geospatial data scientist my expertise lies in bridging data-intensive computational geography with water resources research through open-source software and data solutions. In both the commercial and federal space, I have led enterprise scale efforts to develop and disseminate foundational datasets supporting research, operational forecasting, and decision-making across scales. Beyond research, I mentor and teach future scientists as an affiliate at multiple universities and actively publish peer-reviewed literature to advance the field.

Education

University of California, Santa Barbara
PhD in Geography

SANTA BARBARA, CA
2021

- **Advisor**: Dr. Keith C. Clarke
- **Committee**: Hugo Loaiciga, Kelly Caylor, David Blodgett
- **Title**: Spatial Data Science in Continental Scale Hydrology: 12 Case Studies in Data Models, Data Structures, Modeling, and Evaluation

California Polytechnic State University
BS in Anthropology & Geography

SAN LUIS OBISPO, CA
2010 - 2015

- Cum Laude
- Outstanding Senior Award: College of Liberal Arts
- **Minors**: **(1)** GIS for Agriculture **(2)** Water Science (Watershed Management) **(3)** Statistics **(4)** Economics **(5)** Environmental Studies

Employment

Lynker
Fort Collins, Colorado

CHIEF DATA SCIENTIST
April 2025 - Present

NOAA Office of Water Prediction
Remote

GEOSPATIAL SCIENCE & TECHNOLOGY LEAD
Dec 2024 - Mar 2025

- Led an 8 person Hydrofabric Program advancing hydrologic and flood modeling efforts with geospatial, machine learning, and cloud solutions
- In the first 30 days, established a roadmap for the Program, including a comprehensive data management strategy, a cloud-based data dissemination platform, and a collaborative ecosystem for federal, academic, and private partners.
- Supplied the methods to reduce the cost of a premier flood mapping service by 60% through a novel data pipeline with improved accuracy.
- Served as Product Owner and lead developer for mission-critical data assets supporting nearly $130 million of investment in the Next Generation Water Resource Modeling Framework Prototype & Prediction Capabilities.
- Designed and launched spatial.water.noaa.gov, a data dissemination and visualization platform providing seamless access to 2TB of national hydrographic, elevation, and building datasets
- Position ended during the 2025 DOGE cuts affecting 880+ probationary NOAA/NWS employees, despite demonstrated impact on national water prediction capabilities.

Colorado State University
Fort Collins, CO

RESEARCH & TEACHING AFFILIATE
April 2024 - Present

- Collaborate with researchers and student across the Environmental Science & Sustainability Program.
- Teach upper division and graduate courses in quantitative reasoning and geospatial data science.
- Host data science interns to support the Professional Science Masters Program.

University of Alabama
Remote

GRADUATE FACULTY (AFFILIATE)
Oct 2023 - Present

- Serve as member or co-chair on dissertation and thesis committees.

Lynker
Fort Collins, Colorado

CHIEF DATA SCIENTIST (WEATHER & WATER DIVISION)
Sep 2023 - Dec 2024

- Pursued business development strategies that secured over $15 million in funding to grow a core spatial data program that became a cornerstone of the company's technical portfolio.
- Architected innovative geospatial software and data management solutions published in peer-reviewed literature and adopted as enterprise-level systems by NOAA and USGS, significantly advancing federal water resource capabilities.
- Designed and maintained a cloud optimized data dissemination platform (lynker-spatial.com) to support the Next Generation Water Resource Modeling Framework Prototype and Prediction Capabilities by efficiently serving more than 90,000 requests monthly with 99.9% reliability.

Water Resources Data Scientist *Aug 2020 - Sep 2023*

- Supported existing contracts and pursued growth in spatial data programs.
- Built, mentored, and retained a high-performing team of 12 data scientists with diverse technical backgrounds.
- Established strategic partnerships across federal agencies, research institutions, and private organizations.

NOAA Office of Water Prediction (Contractor) *Remote*

Hydrofabric Technical Director *Sep 2022 - Dec 2024*

- Led the development of NOAA's Enterprise Hydrofabric solution, supporting multi-scale hydrologic and hydraulic modeling across the Analysis & Prediction and Geo-Intelligence Divisions.
- Partnered with USGS to develop federal software and data products advancing and aligning NOAA & USGS Water Mission Areas.
- Contributing author to international standards for hydrologic data, and novel approaches to support modeling, prediction, and evaluation.
- Regularly presented OWP's technical progress to agency leadership and the broader community through monthly updates, joint USGS-NOAA meetings, and scientific conferences.

Senior Data Scientist / Lead Hydrofabric Developer *Aug 2020 - Present*

- Supported NOAA's mission to advance hydrologic prediction capabilities through geospatial science.
- Independently prototyped a hydrofabric solution for the Next Generation Water Resource Modeling Framework.

Research Coordinator *2016*

- Coordinated research activities within the Summer Institute program.
- Facilitated collaboration between participants, mentors, and program organizers.
- Contributed to the continuous improvement of the program.

Urban Flooding Open Knowledge Network *Remote*

Lead Data Scientist (Independent Contractor) *Nov 2019 - Apr 2023*

- Co-authored successful proposals to NSF and served as an advocate for the team in the initial C-ACCEL program
- Developed and designed a cost effective, cloud native, building level, flood forecasting system for the Continental United States.

UC Santa Barbara *Santa Barbara, California*

Lecturer - Geography Department *Summer 2020, 2021*

- Designed and taught the first geoinformatics course for UC Santa Barbara.

Visiting Researcher *Amsterdam, Boulder, Tuscaloosa*

- **Institute for Environmental Studies. Vrije Universiteit**, Amsterdam, Netherlands: June - July 2019; January - March 2018
- **Research Applications Laboratory. NCAR**, Boulder, Colorado: August - September 2018
- **NOAA National Water Center**. Tuscaloosa, Alabama: Summers of 2016, 2017

Publications

I actively contribute to the academic literature about the state of my field. **G** 1404 citations; **h-index** 15; **i-index** 18

1. Narock, T., **Johnson, J.**, Singh-Mohudpur, J., & Rad, A. (2025). Building occupancy type classification and uncertainty estimation using machine learning and open data. *Environmental Data Science*.
2. Fang, S., **Johnson, J.**, & Sankarasubramanian, A. (2024). Leveraging synthetic aperture radar (SAR) with the national water model (NWM) to improve above-normal flow prediction in ungauged basins. *Environmental Research Letters*.
3. Fang, S., **Johnson, J.**, Yeghiazarian, L., & Sankarasubramanian, A. (2024). Improved national-scale above-normal flow prediction for gauged and ungauged basins using a spatio-temporal hierarchical model. *Water Resources Research*.
4. **Johnson, J.**, Afshari, S., & Rad, A. (2024). AHGestimation: An r package for computing robust, mass preserving hydraulic geometries and rating curves. *Journal of Open Source Software*.
5. Kim, D., **Johnson, J.**, Clarke, K., & McMillan, H. (2024). Untangling the impacts of land cover representation and resampling in distributed hydrological model predictions. *Environmental Modelling & Software*.
6. Rad, A. M., **Johnson, J.**, Ghahremani, Z., Coll, J., & Frazier, N. (2024). Enhancing river channel dimension estimation: A machine learning approach leveraging the national water model, hydrographic networks, and landscape characteristics. *Journal of Geophysical Research: Machine Learning and Computation*.
7. Blodgett, D., & **Johnson, J.** (2023). Hydrologic modeling and river corridor applications of HY_features concepts. *OGC Public Engineering Report*.
8. Blodgett, D., **Johnson, J.**, & Andy, B. (2023). Generating a reference flow network with improved connectivity to support durable data integration and reproducibility in the coterminous US. *Environmental Modelling & Software*.
9. **Johnson, J.**, Blodgett, D., Clarke, K., & Pollak, J. (2023). Restructuring and serving web-accessible streamflow

data from the NOAA national water model historic simulations. *Nature Scientific Data*.

10. **Johnson, J.**, Fang, S., Sankarasubramanian, A., Rad, A., Cunha, L. K. da, & …. (2023). Comprehensive analysis of the NOAA national water model: A call for heterogeneous formulations and diagnostic model selection. *Journal of Geophysical Research: Atmospheres*.

11. Kohanpur, A., Saksena, S., Dey, S., **Johnson, J.**, Riasi, M., Yeghiazarian, L., & …. (2023). Urban flood modeling: Uncertainty quantification and physics-informed gaussian processes regression forecasting. *Water Resources Research*.

12. Montello, D., Davis, R., **Johnson, J.**, & Chrastil, E. (2023). The symmetry and asymmetry of pedestrian route choice. *Journal of Environmental Psychology*.

13. Rad, A., Abatzoglou, J., Fleishman, E., Mockrin, M., Radeloff, V., Pourmohamad, Y., Cattau, M., **Johnson, J.**, Higuera, P., Nauslar, N., & Sadegh, M. (2023). Social vulnerability of the people exposed to wildfires in US west coast states. *Science Advances*.

14. Blodgett, D., & **Johnson, J.** (2022). nhdplusTools: Tools for accessing and working with the NHDPlus. *nhdplusTools: Tools for Accessing and Working with the NHDPlus*.

15. **Johnson, J.**, Narock, T., Singh-Mohudpur, J., Fils, D., Clarke, K., Saksena, S., & …. (2022). Knowledge graphs to support real-time flood impact evaluation. *AI Magazine*.

16. **Johnson, J.**, & Clarke, K. (2021). An area preserving method for improved categorical raster resampling. *Cartography and Geographic Information Science*.

17. Blodgett, D., **Johnson, J.**, Sondheim, M., Wieczorek, M., & Frazier, N. (2020). Mainstems: A logical data model implementing mainstem and drainage basin feature types based on WaterML2 part 3: HY features concepts. *Environmental Modelling & Software*.

18. Clarke, K., & **Johnson, J.** (2020). Calibrating SLEUTH with big data: Projecting california's land use to 2100. *Computers, Environment and Urban Systems*.

19. Wens, M., Veldkamp, T., Mwangi, M., **Johnson, J.**, Lasage, R., Haer, T., & …. (2020). Simulating small-scale agricultural adaptation decisions in response to drought risk: An empirical agent-based model for semi-arid kenya. *Frontiers in Water*.

20. Clarke, K., **Johnson, J.**, & Trainor, T. (2019). Contemporary american cartographic research: A review and prospective. *Cartography and Geographic Information Science*.

21. **Johnson, J.**, & Clarke, K. (2019). climateR: An r package finding, subsetting, and retrieving geospatial data by AOI. *Https://Zenodo.org/Records/*.

22. **Johnson, J.**, Munasinghe, D., Eyelade, D., & Cohen, S. (2019). An integrated evaluation of the national water model (NWM) height above nearest drainage (HAND) flood mapping methodology. *Natural Hazards and Earth System Sciences (NHESS)*.

23. **Johnson, J.**, Wens, M., Zagaria, C., & Veldkamp, T. (2019). Integrating human behavior dynamics into drought risk assessment—a sociohydrologic, agent-based approach. *Wiley Interdisciplinary Reviews: Water*.

24. De Cicco, L., Lorenz, D., Hirsch, R., Watkins, W., & **Johnson, J.** (2018). dataRetrieval: R packages for discovering and retrieving water data available from US federal hydrologic web services. *US Geological Survey*.

25. **Johnson, J.**, Coll, J., Ruess, P., & Hastings, J. (2018). Challenges and opportunities for creating intelligent hazard alerts: The "FloodHippo" prototype. *JAWRA Journal of the American Water Resources Association*.

26. Lo'aiciga, H., & **Johnson, J.** (2018). Infiltration on sloping terrain and its role on runoff generation and slope stability. *Journal of Hydrology*.

27. **Johnson, J.**, & Lo'aiciga, H. (2017). Coupled infiltration and kinematic-wave runoff simulation in slopes: Implications for slope stability. *Water*.

Funded Work

Developing a Freshwater Digital Twin for the Dangermond Preserve	*2024*
The Nature Conservancy, Jack and Laura Dangermond Preserve	*PI, Author*
NOAA OWP Geospatial Services	*2023-2025*
NOAA Office of Water Prediction	*Lead Data Scientist, Co-author*
NOAA OWP Next Generation Water Resource Modeling Framework Development	*2022-2024*
NOAA Office of Water Prediction	*Lead Data Scientist, Co-author*

Increasing Environmental Data Access through a more robust federated data catalog and extending the climateR model to Python	*2023*
Earth Science Information Partners	*Lead Data Scientist, Co-author*
Machine Learning for Flood Risk Assessment	*2022*
Earth Science Information Partners	*Data Scientist*
The UFOKN: Delivering Flood Information to AnyOne, AnyTime, AnyWhere	*2020-2022*
National Science Foundation	*Lead Data Scientist, Co-author*
Convergence Accelerator Phase I (RAISE): The Urban Flooding Open Knowledge Network (UFOKN)	*2019-2020*
National Science Foundation	*Lead Data Scientist*
A National Water Model R Package: Improving access and application of model output	*2018-2019*
UCAR COMET	*Co-PI, Co-author*
FOSSFlood: The LivingFlood Application Built on Free Open Source Software	*2017-2018*
UCAR COMET	*Co-PI, Co-author*
Integrating farmers' adaptive behaviors in California's Central Valley to assess water and food security risks under climate change	*2017-2018*
UCGHI Planetary Health Seed Grant	*Co-PI, Co-author*
CUAHSI HydroInformatics Fellowship	*2020-2021*
CUAHSI	*PI, Author*
Jack and Laura Dangermond GIS Fellow in Residence	*2019-2020*
Jack and Laura Dangermond	*Graduate Student*
National Water Center Summer Institute	*2016*
CUAHSI	*Research Coordinator*
Disciplines Fellowship	*2015-2016*
University of California Regents	*Graduate Student*

Knowledge Shareing

I have designed and taught data science courses at the lower-division, upper-division, and graduate levels. I was a teaching assistant for over 15 courses. In total, these have supported more than 1,000 students. I have also led community workshops for national organizations and presented at national science meetings.

University Teaching

Environmental Data Science Applications: Water Resources	*Fort Collins, CO*
Colorado State University	*2025*
• Taught to address the growing need for data science in the Environmental Science profession.	
Quantative Reasoning for Environmental Science	*Fort Collins, CO*
Colorado State University	*2025*
• Taught to address the growing need for data science in the Environmental Science profession.	
• Open course content available here	
Introduction to Geoinformatics	*Santa Barbara, CA*
University of California, Santa Barbara, California	*2021*
• Independently developed and taught to address the growing need for data science in the GIS profession.	
• Intended to become prerequisite course for the UCSB Geography Department and Masters in GIS Curriculum	
• Open course content available here	

Teaching Assistant

Cartographic Design and Geovisualization	*2018*
Dr. Keith Clarke	*Upper-Division*
Conceptual Modeling and Programming for the Geo-Sciences	*2020, 2019, 2017*
Dr. Krzysztof Janowicz	*Upper-Division and Graduate*

Environmental Water Quality	*2017*
Dr. Hugo Loaiciga	*Upper-Division*
Living with Global Warming	*2020, 2019, 2018, 2016*
Dr. Catherine Gautier	*Lower-Division*
Maps and Spatial Reasoning	*2019, 2018, 2017*
Dr. Werner Kuhn, Dr. Keith Clarke	*Lower-Division*
Oceans and Atmosphere	*2016*
Dr. Tim DeVeries	*Lower-Division*
Remote Sensing of the Environment 1	*2020*
Dr. Joe McFadden	*Upper-Division*
Remote Sensing of the Environment 2	*2021, 2020*
Dr. Vena Chu, Alana Ayasse	*Upper-Division*
Remote Sensing of the Environment 3	*2019*
Dr. Vena Chu	*Upper-Division*

Invited Presentations / Workshops

Data and Architectural Advances (and limits) towards improved local and large scale modeling	*Feb 2024*
National Reservoir Data Symposium	*Invited Talk*
Increasing Environmental Data Access: The ClimateR and ClimatePy Ecosystems	*Jan 2024*
ESIP Winter Meeting	*Plenary*
Primer on earth science data standards	*Jan 2024*
ESIP Winter Meeting	*Invited Talk*
The NOAA Next Generation Water Resource Modeling Framework Hydrofabric	*Jan 2024*
AMS: Baltimore	*Conference Talk*
Current State of the NOAA NextGen Enterprise Hydrofabric System	*Dec 2023*
AGU San Fransisco	*Conference Talk*
Integrated Hydro-Terrestrial Modeling 2.0	*Oct 2023*
ICF Global Headquarters Conference Center	*Workshop*

- Workshops to advance community modeling and integrated water resources management.
- Nominated by NOAA to attend.

Meeting Data Where it Lives the power of virtual access patterns	*Mar 2023*
ESIP Rants and Raves: Information Technology and Interoperability (IT&I) Tech Dive	*Invited Talk*

- Exploring the underutilized potetnial of GDAL virtual access patterns in a 1 hour technical talk.

R and Python Tools for Geospatial Water Applications	*May 2022*
AWRA 2022 Geospatial Water Technology Conference	*Workshop Co-lead*
The NOAA NextGen Water Resources Modeling Framework Hydrofabric: Version 1.0	*Dec 2022*
AGU: Chicago	*Conference Talk*
Working with Geospatial Hydrologic Data Using Web Services	*July 2022*
Internet of Water	*Workshop Co-lead*
Introducing a building level, continental scale, flood risk forecast system	*Dec 2022*
AGU: Chicago	*Conference Talk*
Introduction to core hydrofabric services and concepts	*June 2022*
NOAA 2022 Summer Institute	*Workshop Lead*
NOAA USGS Quarterly Meetings	*Nov 2022*
NOAA-USGS Quarterly Meetings	*Invited Talk*

- Briefed USGS and NOAA Leadership at Quartly Meeting.
- Represented ongoing NOAA USGS collaboration.

The NextGen Hydrofabric: What Is It, How to get it, and how to make your own?	*May 2023*
CIROH Training and Developer's conference	*Workshop Lead*

- Design and led 2 workshops exposing over 100 new developers to the avaialbe tools, data models, and dataset developed.

NOAA USGS Modeling Workshop *Oct 2022*

National Conservation Training Center Facility *Stratigic Planning Workshop*

- USGS/NOAA Programatic Level Setting

Leveraging the NHGF and NextGen derived products for Research *June 2023*

NOAA 2023 Summer Institute *Workshop Lead*

End-to-end Hydrofabric workflows for the NextGen Water Resources Modeling Framework *Jun 2022*

Fronteirs in Hydrology: Puerto Rico *Conference Talk*

End to End Hydrofabric Workflows *May 2024*

CIROH Training and Developer's conference *Workshop Lead*

- Design and led workshops sharing progress within the NOAA Enterprise Hydrofabric Solution

Tools for Processing the NHDPlus into a Hydrofabric Suitable for Use in the NextGen National Water Model *Dec 2021*

AGU: New Orleans *Conference Talk*

Community Hydrofabric Development *May 2025*

CIROH Training and Developer's conference *Workshop Lead*

- Design and led workshops sharing how CIROH members can contribute to the evolving hydrofabric effort

Award Nominations

Nominated for UCSB GSA Excellence in Teaching by students *2020, 2019*

Nominated for UCSB Geography Excellence in Teaching by faculty member *2020, 2019*

Open Source Software

A output of my work is open source software in personal & federal repositories. ○ ♣ 249 followers; ★ 901 stars

AOI

Fast and flexible geocoding and AOI creation. *Lead Developer*

climateR

Instant access to gridded and observation climate data. *Lead developer*

climateR-catalogs

A consistent federated data catalog for programmatic access. *Lead developer*

zonal

Fast, flexable spatial data summarization. *Lead developer*

nwmTools

National Water Model Streamflow access. *Lead developer*

DOI-USGS/nhdplusTools

Manipulating hydrographic data with the NHDPlus data model. *Author*

DOI-USGS/dataRetrieval

R Interface to the USGS data holdings. *Author*

NOAA-OWP/hydrofabric

Generating data products for continental scale hydrology *Lead Developer*

AHGestimation

Estimating robust, mass conserving AHG relationships with cross section hydrualics and geometry *Lead Developer*