# Dr. J Michael **Johnson**

Data Scientist | Geographer | Water Resources

*Fort Collins, Colorado*

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*I am a **water resource data scientist** at Lynker leading the **hydrofabric development for NOAA's Next Generation National Water Model** along with the federal efforts to define a national suite of hydroinformatic data products. I seek to bridge **data-intensive computational geography** with **water resources research** and develop open-source software to ease community access to big data.*

## Employment

### Lynker
*Fort Collins, Colorado*

Data Scientist
*August 2020 - Present*

- Lead the spatial data development for the NOAA NextGen Water Resource Modeling Framework
- Contribute to local and state level consulting projects related to water resource managment and hazard mitigation
- Recruit, retain, and mentor a strong and diverse group of data scientists

### NOAA Office of Water Prediction
*Remote*

Hydrofabric Technical Director
*Sep 2022 - Present*

- Develop the foundational geospatial data to support verson 4 of the National Water Model
- Collaborate with the USGS to build a suite of tools and data products supporting the National Hydrologic Geospatial Fabric
- Lead a team developing novel Machine learning, geospaial, and cloud based solutions of more open and skilled science

### Urban Flooding Open Knowledge Network
*Remote*

Lead Data Scientist
*Sep 2019 - Apr 2023*

- Co-authored two successful proposals to NSF and acted 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.

### Geography Department
*UC Santa Barbara*

Lecturer
*2021*

- Designed and taught the first programming based GIS course for UCSB in R.

### NOAA Office of Water Prediction
*Tuscaloosa, AL*

Course Coordinator
*2016*

- Lead students towards the successful execution of projects related to the National Water Model Research Fellow
- Worked at the National Water Center in advancement of the National Water Model

### Visiting Researcher

Graduate Student

- **Institute for Environmental Studies**. Vrije Universiteit, Amsterdam: 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

## Education

### University of California, Santa Barbara
*Santa Barbara, CA*

PhD in Geography
*2021*

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

### California Polytechnic State University
*San Luis Obispo, CA*

BS in Anthropology & Geography, Cum Laude
*2010 - 2015*

- Recipient of the Outstanding Senior Award
- **Minors**: **(1)** GIS for Agriculture **(2)** Water Science (Watershed Management) **(3)** Statistics **(4)** Economics **(5)** Environmental Studies

## Publications

Google Scholar: 375 citations; 20 collaborators; 22 papers
**h-index** 9; **i-index** 8

Blodgett, D., & **Johnson, J.** (2023). Hydrologic modeling and river corridor applications of HY_features concepts. *OGC Public Engineering Report*.

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*.

Fang, S., **Johnson, J.**, Yeghiazarian, L., & Sankarasubramanian, A. (2023). Improved national-scale flood prediction for gauged and ungauged basins using a spatio-temporal hierarchical model. *Authorea Preprints*.

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*, *59 (3), e2022WR033939*.

Montello, D., Davis, R., **Johnson, J.**, & Chrastil, E. (2023). The symmetry and asymmetry of pedestrian route choice. *Journal of Environmental Psychology*, *102004*.

**Johnson, J.**, Coll, J., Clarke, K., Afshari, S., Saksena, S., & Yeghiazarian, L. (2022). Determining feature based hydraulic geometry and rating curves using a physically based, computationally efficient framework. *Preprints*.

**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*, *43 (1), 40-45*.

**Johnson, J.**, & Clarke, K. (2021). An area preserving method for improved categorical raster resampling. *Cartography and Geographic Information Science*, *48 (4), 292-304*.

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*, *135, 104927*.

Clarke, K., & **Johnson, J.** (2020). Calibrating SLEUTH with big data: Projecting california's land use to 2100. *Computers, Environment and Urban Systems*, *83, 101525*.

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*, *2, 15*.

Clarke, K., **Johnson, J.**, & Trainor, T. (2019). Contemporary american cartographic research: A review and prospective. *Cartography and Geographic Information Science*, *46 (3), 196-209*.

**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)*.

**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, e*, *e1345*.

Blodgett, D., & **Johnson, J.** (2018). nhdplusTools: Tools for accessing and working with the NHDPlus. *Avaiable from Https://Code. Usgs. Gov/Water/nhdplusTools*.

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, Reston, VA, Https://Doi. Org/*, */10.5066/P9X4L3GE*.

**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*.

Lo'aiciga, H., & **Johnson, J.** (2018). Infiltration on sloping terrain and its role on runoff generation and slope stability. *Journal of Hydrology*, *561, 584-597*.

**Johnson, J.**, Coll, J., Cohen, S., Nelson, J., Ogden, F., Praskievicz, S., & …. (2017). National water center innovators program summer institute report 2017. *Consortium of Universities for the Advancement of Hydrologic Science, Inc.*

**Johnson, J.**, & Lo'aiciga, H. (2017). Coupled infiltration and kinematic-wave runoff simulation in slopes: Implications for slope stability. *Water*, *9 (5), 327*.

Coll, J., **Johnson, J.**, & Ruess, P. (2016). Radar measurement and flow modeling: methods. *NATIONAL WATER CENTER INNOVATORS PROGRAM SUMMER INSTITUTE REPORT*, *2016 4, 7*.

**Johnson, J.**, Ruess, P., & Coll, J. (2016). OPERA–operational platform for emergency response and awareness: Reimagining disaster alerts. *NATIONAL WATER CENTER INNOVATORS PROGRAM SUMMER INSTITUTE REPORT*, *2016 4, 97*.

## Grants and Fellowships

I have personally solicited **$436,000** for research and development and been a core member of teams who have solicited **$19,277,519**.

**NOAA OWP Geospatial Services** — *$8,000,000*
NOAA Office of Water Prediction — *2023-2025*

**NOAA OWP Next Generation Water Resource Modeling Framework Development** — *$7,300,000*
NOAA Office of Water Prediction — *2022-2024*

**Increasing Environmental Data Access through a more robust federated data catalog and extending the climateR model to Python** — *$6,000*
Earth Science Information Partners — *2023*

**Machine Learning for Flood Risk Assessment** — *$20,000*
Earth Science Information Partners — *2022*

**The UFOKN: Delivering Flood Information to AnyOne, AnyTime, AnyWhere** — *$2,853,561 (Subaward: $240,000)*
National Science Foundation — *2020-2022*

**Convergence Accelerator Phase I (RAISE): The Urban Flooding Open Knowledge Network (UFOKN)** — *$1,027,958 (Subaward: $100,000)*
National Science Foundation — *2019-2020*

**A National Water Model R Package: Improving access and application of model output** — *$15,000*
UCAR COMET — *2018-2019*

**FOSSFlood: The LivingFlood Application Built on Free Open Source Software** — *$5,000*
UCAR COMET — *2017-2018*

**Integrating farmers' adaptive behaviors in California's Central Valley to assess water and food security risks under climate change** — *$10,000*
UCGHI Planetary Health Seed Grant — *2017-2018*

**CUAHSI HydroInformatics Fellowship** — *$5,000*
CUAHSI — *2020-2021*

**Jack and Laura Dangermond GIS Fellow in Residence** — *$5,000*
Jack and Laura Dangermond — *2019-2020*

**Disciplines Fellowship** — *$30,000*
University of California Regents — *2015-2016*

## Teaching experience

### University Teaching

**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

**Remote Sensing of the Environment 2** — *2021, 2020*
Dr. Vena Chu, Alana Ayasse — *Upper-Division*

**Living with Global Warming** *2020, 2019, 2018, 2016*

Dr. Catherine Gautier *Lower-Division*

**Conceptual Modeling and Programming for the Geo-Sciences** *2020, 2019, 2017*

Dr. Krzysztof Janowicz *Upper-Division and Graduate*

**Remote Sensing of the Environment 1** *2020*

Dr. Joe McFadden *Upper-Division*

**Remote Sensing of the Environment 3** *2019*

Dr. Vena Chu *Upper-Division*

**Maps and Spatial Reasoning** *2019, 2018, 2017*

Dr. Werner Kuhn, Dr. Keith Clarke *Lower-Division*

**Cartographic Design and Geovisualization** *2018*

Dr. Keith Clarke *Upper-Division*

**Environmental Water Quality** *2017*

Dr. Hugo Loaiciga *Upper-Division*

**Oceans and Atmosphere** *2016*

Dr. Tim DeVeries *Lower-Division*

### 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

Github: 178 followers; 525 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*

**DOI-USGS/hyRefactor**

Manipulating the NHDPlus Network for Hydrologic Modeling. *Author*

**NOAA-OWP/hydrofabric**

Generating data products for continental scale hydrology *Lead Developer*