

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 management 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 version 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, geospatial, 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. *Available 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
<ul style="list-style-type: none">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 CurriculumOpen 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 DR. CATHERINE GAUTIER	2020, 2019, 2018, 2016 Lower-Division
Conceptual Modeling and Programming for the Geo-Sciences DR. KRZYSZTOF JANOWICZ	2020, 2019, 2017 Upper-Division and Graduate
Remote Sensing of the Environment 1 DR. JOE MCFADDEN	2020 Upper-Division
Remote Sensing of the Environment 3 DR. VENA CHU	2019 Upper-Division
Maps and Spatial Reasoning DR. WERNER KUHN, DR. KEITH CLARKE	2019, 2018, 2017 Lower-Division
Cartographic Design and Geovisualization DR. KEITH CLARKE	2018 Upper-Division
Environmental Water Quality DR. HUGO LOAICIGA	2017 Upper-Division
Oceans and Atmosphere DR. TIM DEVERIES	2016 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