J. MICHAEL JOHNSON

Curriculum Vitae · December 12, 2020

University of California, Santa Barbara, California · Department of Geography

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Keywords:

Geoinformatics (GIS); Hydroinformatics; Water Resource Modeling; Computational Hydrology

EDUCATION:

March 2021 (Expected) — **University of California, Santa Barbara, California (UCSB)**

> **Degree:** PhD Candidate in Geography (ABD)

> **Advisor:** Dr. Keith C. Clarke

> **Committee:** Dr(s) Hugo Loaiciga, Kelly Caylor, David Blodgett (USGS)

> **Dissertation:** Spatial Challenges of 21^{st} Century Water Resource Research

2015 — **California Polytechnic State University, San Luis Obispo, CA**

> **Degree:** B.S. Anthropology & Geography

> **Honors:** Cum Laude

> **Minors:** Geographic Information Systems (GIS) for Agriculture
> Statistics
> Water Science (Watershed Management Emphasis)
> Environmental Studies
> Economics

EMPLOYMENT:

Sep 2019 - Present — **Data Scientist**: Urban Flooding Open Knowledge Network

Sep 2020 - Present — **Water Resourcees Engineer II***: Lynker Technologies/ NOAA-Affiliate
Assigned to the NOAA Next Generation Water Modeling Engine and Framework Prototype development group

*obtained security clearance (secret)

AWARDS AND FELLOWSHIPS:

Awards And Fellowships

Year	Purpose	Source	Amount
2020	Summer Support Research Grant	UCSB Geography	$700

2020	Nominated for UCSB Geography Excellence in Teaching Award	Nominated by Faculty Member	
2020	Nominated for UCSB GSA Excellence in Teaching Award	Nominated by Students	
2019	Jack & Laura Dangermond Fellowship	Jack and Laura Dangermond	$5,000
2019	Visiting Scholar Research Grant	Vrije Universiteit Amsterdam	$2,500
2019	Nominated for UCSB Geography Excellence in Teaching Award	Nominated by Faculty Member	
2019	Nominated for UCSB GSA Excellence in Teaching Award	Nominated by Students	
2018	Summer Support Research Grant	UCSB Geography	$2,400
2015	Disciplines Fellowship	University of California Regents	$30,000
2015	Top Undergraduate Paper	California Geographical Society	$500
2015	Outstanding Senior	Cal Poly Department of Geography	

Travel Grants

Year	Purpose	Source	Amount
2019	American Geophysical Union	Dangermond Fund	$500
2018	American Geophysical Union	Graduate Student Association	$200
2017	American Geophysical Union	Dangermond Fund	$800
2017	WRF-Hydro Training	CUAHSI	$500
2016	HAZUS Conference	Dangermond Fund	$700

FUNDED RESEARCH PROJECTS:

[6] **Lead Data Scientist / Developer**: *The Urban Flooding Open Knowledge Network (UF-OKN): Delivering Flood Information to AnyOne, AnyTime, AnyWhere*, National Science Foundation (2020-2022) $2,853,561

[5] **Principal Investigator**: *Programmatic and GUI-driven retrieval and visualization of streamflow for all CONUS rivers*, Consortium of Universities for the Advancement of Hydrologic Science, Inc. (2020-2021) $5,000

[4] **Data Scientist / Developer**: *Convergence Accelerator Phase I (RAISE): The Urban Flooding Open Knowledge Network*, National Science Foundation (2019-2020) $1,027,958

[3] **Co-Principal Investigator**: *A National Water Model R Package: Improving access and application of model output*, UCAR COMET (2018-2019) $15,000

[2] **Contributor**: *FOSSFlood: The LivingFlood Application Built on Free Open Source Software*, UCAR COMET (2017-2018) $5,000

[1] **Co-Principal Investigator**: *Integrating farmers' adaptive behaviors in California's Central Valley to assess water and food security risks under climate change*, UCGHI Planetary Health Seed Grant (2017-2018) $10,000

RESEARCH:

Peer-Reviewed Journal Articles

[10] **J.M. Johnson**, Keith C. Clarke. (2020). "An Area Preserving Method for Improved Categorical Raster Resampling". *Cartography and Geographic Information Science (In Press).*

[9] David Blodgett, **J.M. Johnson**, Mark Sondheim, Michael Wieczorek, Nels Frazier. (2020). "Mainstems: A logical data model implementing mainstem and drainage basin feature types based on WaterML2 Part 3: HY-Features concepts.". *Environmental Software & Modelling.* Available here.

[8] Wens, M., Veldkamp, T., Mwangi,M., **J.M. Johnson**, Lasage, R., de Moel, H., Haer, T, and Aerts, J.C.J.H.. (2020). "Simulating small-scale agricultural adaptation decisions in response to drought risk: an empirical agent-based socio-hydrologic drought risk model for semi-arid Kenya". *Frontiers in Water.* Available here.

[7] Keith C. Clarke, **J.M. Johnson**. (2020). "Calibrating SLEUTH with Big Data: Projecting California's Land Use to 2100". *Computers, Environment and Urban Systems.* Available here.

[6] Keith C. Clarke, **J.M. Johnson**, Tim Trainor. (2019). "Contemporary American Cartographic Research: A Review and Prospective". *Cartography and Geographic Information Science.* Available here.

[5] **J.M. Johnson***, Marthe Wens*, Cecilia Zagaria, T.I.E Veldkamp. (2019). "Integrating human behavior dynamics into drought risk assessment - A socio-hydrologic, agent-based approach". *WIRES Water (*co-first author).* Available here.

[4] **J.M. Johnson**, Dinuke Munasinghe, Damilola Eyelade, Sagy Cohen. (2019). "An Integrated Evaluation of the National Water Model (NWM) Height Above Nearest Drainage (HAND) Flood Mapping Methodology". *Natural Hazards and Earth System Sciences.* Available here.

[3] H.A. Loaiciga, **J.M. Johnson**. (2018). "Infiltration on sloping terrain and its role on runoff generation and slope stability". *Journal of Hydrology.* Available here.

[2] **J.M. Johnson**, Jim M. Coll, Paul J. Ruess, and Jordan T. Hastings. (2018). "Challenges and Opportunities for Creating Intelligent Hazard Alerts: The 'FloodHippo' Prototype". *Journal of the American Water Resources Association (JAWRA).* Available here.

[1] **J.M. Johnson**, H.A. Loaiciga. (2017). "Coupled Infiltration and Kinematic-Wave Runoff Simulation in Slopes: Implications for Slope Stability". *Water.* Available here.

In Review Articles

[3] **J.M. Johnson**, David L. Blodgett, Keith C. Clarke, Jon Pollack. (2020). "Optimized time series retrieval from the hourly 1993-2018 NOAA National Water Model Reanalysis Products". *Nature Scientific Data (In Revision).*

[2] **J.M. Johnson**, Damilola Eyelade, Keith C. Clarke. (2020). "Characterizing Roughness in Terrain Based Synthetic Rating Curves". *Water Resources Research.*

[1] **J.M. Johnson**, Amir Mazrooei, A.Sankarasubramanian, Keith C. Clarke, Lilit Yeghiazarian. (2020). "Diagnosing performance in continental-scale, high-resolution, processed-based hydrologic models: The National Water Model". *JGR: Atmospheres.*

Technical Reports

[4] **J.M. Johnson**, [+22 others]. (2020). "Moving from Information to Insight by Linking Urban and Hydrologic Systems through the Urban Flooding Open Knowledge Network". *American Water Resources Association IMPACT Magizene: Geospatial Water Technology.*

[3] **J.M. Johnson**, Coll J.M, et al. (2017). "National Water Centers Innovators Program Summer Institute Report". *Consortium of Universities for the Advancement of Hydrologic Science, Inc. Technical Report 14.* Available here.

[2] Coll J.M, **J.M. Johnson**, Ruess P.J.. (2016). "Radar Measurement and Flow Modeling: Methods". *National Water Center Innovators Program Summer Institute Report. Consortium of Universities for the Advancement of Hydrologic Science, Inc. Technical Report 13, Ch 1.* Available here.

[1] **J.M. Johnson**, Coll J.M, Ruess P.J.. (2016). "OPERA-Operational Platform for Emergency Response and Awareness: Reimagining Disaster Alerts". *National Water Center Innovators Program Summer Institute Report. Consortium of Universities for the Advancement of Hydrologic Science, Inc. Technical Report 13, Ch 11.* Available here.

Cartography

[3] **J.M. Johnson**. (2017). "Map of Staats-Brabant indicating territories and boundaries c. 1648 [map]. Scale not given". *van de Meerendonk et al. Striving for Unity: The Significance and Original Context of Political Allegories by Theodoor van Thulden for 's-Hertogenbosch Town Hall. Early Modern Low Countries. Figure 6.* Available here.

[2] **J.M. Johnson**. (2017). "Rising Sea Levels: Hawaii [map]. Scale not given". *Water: An Atlas. Oakland, CA: Guerrilla Cartography.*

[1] **J.M. Johnson**. (2017). "Peoples and Regions of Africa [map]. Scale not given". *Cole, Herbert M. Maternity: Mothers and Children in the Arts of Africa, CT: Yale University Press.*

SCIENTIFIC SOFTWARE:

Author, Creator

[6] **AOI** — **An R package for fast & flexible geocoding, boundary query, and AOI generation**
https://mikejohnson51.github.io/AOI/

[5] **climateR** — **An R client for compiling gridded and observation climate data**
https://mikejohnson51.github.io/climateR-intro

[4] **FloodMapping** — **An R Package for flood mapping using HAND and the National Water Model**
https://mikejohnson51.github.io/FloodMapping/

[3] **nwmHistoric** — **An R package for accessing the National Water Model reanalysis streamflow**
mikejohnson51.github.io/nwmhistoric/

[2] **NFHL** **R Interface to the FEMA National Flood Hazards Layer**
https://github.com/mikejohnson51/NFHL

[1] **NWM** **An R client for the operational National Water Model**
https://mikejohnson51.github.io/NWM/

Author On

[1] **USGS-R dataRetrieval** **R Interface to the USGS data holdings**
https://usgs-r.github.io/dataRetrieval/

Contributor To

[2] **USGS-R nhdplusTools** **An R API for manipulating hydrographic data using the NHDPlus data model**
https://usgs-r.github.io/nhdplusTools/

[1] **elevatr** **An R package for accessing elevation data from various sources**
https://github.com/jhollist/elevatr

Roles as assigned in package description and defined here

INSTRUCTOR, DEPARTMENT OF GEOGRAPHY, UCSB:

Summer 2020 **Geograhpy 176**: Introduction to Geographic Information Science

> Independently developed a complete Geoinformatics course to address the growing need for data science and programming in GIS profession.
> Taught the foundations of reproducible data science, spatial data models, and programming to a class of 48 students
> Content Available here: https://mikejohnson51.github.io/spds/

TEACHING ASSISTANT, DEPARTMENT OF GEOGRAPHY, UCSB:

[10] **2020** **Introduction to GIS**
Instructor - *Independently designed and taught*

[9] **2020, 2019, 2018, 2016** **Living with Global Warming**
Teaching Assisstant - *Dr. Catherine Gautier*

[8] **2020, 2019, 2017** **Conceptual Modeling and Programming for the Geo-Sciences**
Teaching Assisstant - *Dr. Krzysztof Janowicz*

[7] **2020** **Remote Sensing of the Environment 2**
Teaching Assisstant - *Alana Ayasse*

[6] **2020** **Remote Sensing of the Environment 1**
Teaching Assisstant - *Dr. Joe McFadden*

[5] **2019** **Remote Sensing of the Environment 3**
Teaching Assisstant - *Dr. Vena Chu*

[4]	**2019, 2018, 2017**	**Maps and Spatial Reasoning** Teaching Assisstant - *Dr. Werner Kuhn, Dr. Keith Clarke*
[3]	**2018**	**Cartographic Design and Geovisualization** Teaching Assisstant - *Dr. Keith Clarke*
[2]	**2017**	**Environmental Water Quality** Teaching Assisstant - *Dr. Hugo Loaiciga*
[1]	**2016**	**Oceans and Atmosphere** Teaching Assisstant - *Dr. Tim DeVeries*

UNDERGRADUATE RESEARCH MENTORSHIP, UCSB:

2020-2021	Stone Shi (Lucas Fund Scholar Faculity Mentor)
2020	Ryan Erikson, Angus Watters, Wesley Nobel, Jacob Bradslaw
2018	Dino Korac
2017	Benjamin Sterne, Eric Gunter
2016	Jeremy Neil

EXPERIENCE:

2020	Sentinel-1 flood inundation map extraction via deep learning: Advisory Board	Azavea NOAA SBIR Phase I
2019	Visiting Researcher	Vrije Universiteit Amsterdam
2019	Spatial Discovery Experts Meeting	Santa Barbara
2018	Visiting Researcher	NCAR RAL
2018	Visiting Researcher	Vrije Universiteit Amsterdam
2017	Summer Institute Course Coordinator	NOAA National Water Center
2016	Summer Institute Research Fellow	NOAA National Water Center
2016	Head Poster Judge	California Geographical Society
2015	County GIS Technician	El Paso County, Colorado
2014 - 2015	GIS Peer Assistant	Cal Poly Data Studio
2014 - 2019	Certified Agricultural Irrigation Specialist	Irrigation Association
2014	County GIS Intern	San Luis Obispo County, California
2013	Piedras Blancas Mapping and Restoration	Bureau of Land Management

PRESENTATIONS:

[25]	**Nov 2020**	**University of Kansas GIS day** *Climate Analysis with R*	presentation
[24]	**Nov 2020**	**Unidata Users Committee** *Fall 2020 Student Panel*	panel

[23]	**Oct 2020**	**Eco Data Science** *Working with Gridded Climate Data in R*	presentation
[22]	**July 2020**	**ESIP Summer Meeting** *Does slightly better data equal much better information?*	presentation
[21]	**Feb 2020**	**USGS Water Mission Area** *Urban Flooding Open Knowledge Network*	presentation
[20]	**Feb 2020**	**Microsoft Research and Development Team** *Urban Flooding Open Knowledge Network*	presentation
[19]	**Feb 2020**	**ESIP: Interoperability and Technology/Tech Dive Webinar Series** *Urban Flooding Open Knowledge Network*	presentation
[18]	**Dec 2019**	**American Geophysical Union Fall Meeting** *Representing Landcover in the National Water Model*	poster
[17]	**Dec 2019**	**American Geophysical Union Fall Meeting** *Identifying distrubed watersheds using 20 years of MODIS and Google Earth Engine*	poster
[16]	**Dec 2019**	**American Geophysical Union Fall Meeting** *Using Google Earth Engine and MODIS to detect watershed disturbance*	presentation (Google Booth)
[15]	**Dec 2018**	**American Geophysical Union Fall Meeting** *The National Water Model and R: Providing fast discovery, access, and usability of NWM output and earth systems data*	presentation
[14]	**Dec 2018**	**American Geophysical Union Fall Meeting** *Drought adaptation behavior of agricultural stakeholders: An Agent Based Model for Kenya*	presentation
[13]	**June 2018**	**International Congress on Environmental Modelling and Software** *An agent-based approach to evaluating sustainable drought adaptation policy*	presentation
[12]	**June 2018**	**International Congress on Environmental Modelling and Software** *Simulating dynamic drought adaptation behavior of agricultural stakeholders using Agent-Based Models*	presentation
[11]	**April 2018**	**European Geophysical Union** *Integrating Adaption behavior in drought risk analysis*	poster
[10]	**Dec 2017**	**American Geophysical Union Fall Meeting** *HydroData: Discover Earth Systems Data with R*	eLightning talk
[9]	**July 2017**	**CUAHSI Hydroinformatics Conference** *Real-time Discharge-to-Damage Flood Mapping 'Anywhere, USA'*	presentation
[8]	**May 2017**	**@Spatial Tech Talk UCSB Spatial Center** *Accessing National Water Model Output*	presentation
[7]	**Nov 2016**	**UCGIS Webinar** *2017 CUAHSI SI: Collaborative Problem Solving at the National Water Center*	presentation

[6]	**Nov 2016**	**HAZUS Users Conference** *Reimagining Disaster Alert Systems: OPERA*	presentation
[5]	**Oct 2016**	**UCSB-SDSU Retreat** *The Five Meanings of Water Security*	presentation
[4]	**July 2016**	**CUAHSI Biennial Conference** *Densified Radar Measurement and Flow Modeling*	poster
[3]	**May 2016**	**California Geography Society 2016 Annual Conference** *Rising Temperatures and Water Supply: Tools for Water Security*	presentation
[2]	**April 2016**	**UC Student Lobby Conference** *Water Research: Problems with Scale*	presentation
[1]	**May 2015**	**California Geography Society 2015 Annual Conference** *Developing a Decision Support System for California Surface Water*	presentation

REFERENCES:

Keith Clarke, PhD
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Krzysztof Janowicz, PhD
Department of Geography University of California, Santa Barbara, USA
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Associate Professor, Environmental Engineering & Science
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Trey Flowers, PhD
Director of the Analysis and Prediction Division at the National Water Center
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David Blodgett
USGS Office of Water Information Center for Integrated Data Analytics
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