KENDRA E. KAISER, Ph.D.

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EDUCATION

2017 **Duke University, Ph.D.**
Nicholas School of the Environment
Earth and Ocean Sciences

2011 **Montana State University**
B.S. Soil and Water Science (*Honors*)
B.S. Environmental Biology (*Honors*)

RESEARCH POSITIONS

2019- Department of Geosciences, Boise State University&
Human-Environmental Systems Research Center
Research Faculty

2017-2019 Department of Geosciences, Boise State University &
Human-Environmental Systems Research Center
Postdoctoral Researcher
Advisors: Alejandro Flores and Vicken Hillis
Research: Dynamic coupling of agent-based models of land use change and water management with WRF-hydro in the Boise River Basin

2012-2017 Watershed and Biogeochemistry Lab, Duke University
NSF Graduate Research Fellow
Major advisor: Dr. Brian McGlynn
Research: Greenhouse gas fluxes in complex terrain: space-time dynamics of soil CO_2, CH_4, and N_2O.

2016 USGS Idaho Water Science Center, Boise
NSF Graduate Research Intern
Supervisors: Dr. Kyle Blasch, Dr. Roy Sando
Research: Vulnerability of Streams and Rivers in the Western United States to Drought Conditions

2010- 2011 Watershed Hydrology Lab, Montana State University
Research Assistant
Advisors: Dr. Brian McGlynn, Dr. Ryan Emanuel
Research: 'Ecohydrology of an Outbreak: Impacts of vegetation pattern and landscape structure on mountain pine beetle disturbance'

SPONSERED PROJECTS

Current

2020 Predictive Flow Model of Silver Creek, Camas Creek, and the Big Wood River above Magic Reservoir, Wood River Water Collaborative ($12,500), PI

2019 Web-enabled Site Suitability and Visualization for Idaho's Specialty Crop Industry Specialty Crop Block Grant, Idaho State Department of Agriculture ($106,675), Co-PI

2019 Improving water data infrastructure for water management in southwest Idaho Northwest Climate Adaptation Center, Department of Interior ($34,000), PI

2018 Combining top-down and bottom-up approaches to simulate land use change Pacific Northwest National Lab, Department of Energy ($133,105), Co-PI

Pending

2020 Integration of flow permanence and stream temperature models and data rescue Northwest Climate Adaptation Center, Department of Interior ($360,00), Co-PI

2020 Method development for analyzing and predicting the impact of land use conversion on river diversions. Science & Technology Grant, Bureau of Reclamation ($161,00), Co-PI

2020 Collaborative Research: AccelNet: Catalyzing international networks toward a global understanding of drying rivers in the Anthropocene ($750,00), Co-PI

2020 Evaluation of the spatial variability of *E. coli* in irrigation canals for the FDA Produce Safety Rule, ($107,376), PI

Collaborative

2019- Urban Dynamics Interest Group, Integrated Multisector Multiscale Modeling Project, Department of Energy

2018- Dry Rivers Research Coordination Network, National Science Foundation

2016- Probability of Streamflow Permanence Project, Northwest Climate Adaptation Center, Department of Interior

FELLOWSHIPS, AWARDS & HONORS

2019 **Postdoctoral Research Fellowship**, Northwest Climate Adaptation Science Center
2012-2017 **Graduate Research Fellowship,** National Science Foundation
2016 **Graduate Research Internship Program,** National Science Foundation
2016 **Data Expeditions Award,** Duke Information Initiative
2016 **Bass Instructional Fellowship,** Duke Graduate School
2015 **Let's Talk About Water Grant,** CUASHI
2011 **Outstanding Student Poster Award**, EGU

PUBLICATIONS

Kaiser, K.E., Hillis, A.V., Flores, A.N., (2020) Identifying Emergent Agent Types and Effective Practices for Portability, Scalability, and Intercomparison in Water Resource Agent-Based Models, Environmental Modelling & Software. 127 doi: 10.1016/j.envsoft.2020.104671

Zimmer, M., **K.E. Kaiser**, J.R. Blaszczak, S. Zipper, J. Hammond, K. Fritz, K. Costigan, J. Hosen, S. Godsey, G. Allen, S. Kampf, R. Burrows, C. Krabbenhoft, W. Dodds, R. Hale, J. Olden, M.

Shanafield, A. DelVecchia, A. Ward, M. Mims, T. Datry, M. Bogan, K. Boersma, M. Busch, C. Jones, A. Burgin, and D. Allen. (2020) Zero or not? Causes and consequences of zero-flow stream gage readings. WIRES Water doi: 10.1002/wat2.1436

Jaeger, K.L., R. Sando, R.R. McShane, J.B. Dunham, D.P. Hockman-Wert, **K.E. Kaiser**, K. Hafen, J.C. Risley, K.W. Blasch. (2019). Probability of Streamflow Permanence Model (PROSPER): A spatially continuous model of annual streamflow permanence throughout the Pacific Northwest. *Journal of Hydrology X*. doi: 10.1016/j.hydroa.2018.100005

Kaiser, K.E., McGlynn B.L. (2018). Nested scales of spatial and temporal variability of soil water content across a semi-arid montane catchment. *Water Resources Research.* doi: 10.1029/2018WR022591

Kaiser, K.E., McGlynn B.L., Dore, J.E. (2018). Landscape analysis of methane flux across complex terrain. *Biogeosciences*. 15:3143-3167.

Bernhardt, E.S., Blaszczak, J., Ficken, C., Fork, M., **Kaiser, K.E.**, Seybold, E.C. (2017). Ecosystem Control Points – Moving beyond the hot spot hot moment concept. *Ecosystems*. 20:665-682

Kaiser, K.E., McGlynn B.L., Emanuel, R.E. (2013) Ecohydrology of an outbreak: Mountain pine beetles impact trees in drier landscape positions first. *Ecohydrology.* 6: 444–454. doi:10.1002/eco.1286

PUBLICATIONS (in prep)

Kaiser, K.E., A. Flores, C.R., Vernon (*in revision*). Python package for agent-based modeling of land use and land cover change. Journal of Open Research Software.

Kaiser, K.E., A., Flores, V. Hillis, (*in prep*) Modeling reservoir operators as autonomous agents: balancing flood control with water supply. *Water Resources Management*

ADDITIONAL PRODUCTS

Kaiser, K.E., D. Hockman-Wert (2018). Idaho, Oregon, and Washington Stream Permanence Reporters [ArcGIS Web Applications].
usgs.maps.arcgis.com/apps/webappviewer/index.html?id=78f21d6e74f648b186b40c41d83aef32

Kaiser, K.E., J. Freemuth, (2018) Idaho's Water: Supply and Quality in a Time of Growth. Conference Proceedings. Andrus Center for Public Policy, Boise, Idaho.
https://d25vtythmttl3o.cloudfront.net/uploads/sites/135/2019/04/white-paper-6-Final.pdf

ORAL CONFERENCE PRESENTATIONS

Kaiser, K.E., Flores, A., Hillis, V., Linking global and local socio-economic drivers of LULCC in an Agent Based Model. 2019 AGU Fall Meeting

Kaiser, K.E., McGlynn, Spatial and temporal variability of soil moisture and CO_2 fluxes across complex terrain. 2016 AGU Fall Meeting.

Kaiser, K.E., From process complexity to communication effectiveness: A challenge to those within and outside of the environmental sciences. Young Hydrologists Future of Hydrology pop-ups. 2014 American Geophysical Union Fall Meeting.

Kaiser, K.E., McGlynn, B.L., Dore, J.E. Landscape analysis of methane efflux across complex terrain. 2014 AGU Fall Meeting.

Kaiser, K.E., McGlynn, B.L., Dore, J.E. Lorenzo, T.M., Liang, L, Riveros-Iregui, D.A., Emanuel, R.E., Seybold, E.C. Watershed scale soil biogeochemistry and greenhouse gas fluxes: Space-time dynamics of CO_2, CH_4, and N_2O. 2013 AGU Fall Meeting.

Kaiser, K.E., McGlynn, B.L, Emanuel, R.E., Nippgen, F., Mallard J.M. Ecohydrology: Disturbance and the intersection of vegetation pattern and landscape structure. Montana Section of the American Water Resources Association. October 2011.

CONFERENCE POSTER PRESENTATIONS

Kaiser, K.E., Flores, A., Deconvolving Human and Natural Controls on Streamflow. 2019 Society for Freshwater Scientists Annual Meeting

Kaiser, K.E., Flores, A., Hillis, V., Modeling reservoir operators as autonomous agents: balancing flood control with water supply. 2018 CUASHI biennial meeting.

Kaiser, K.E., Flores, A., Hillis, V., Water management typologies for agent based modeling of water resources and its application in the Boise River Basin, USA. 2017 AGU Fall Meeting.

Kaiser, K.E., McGlynn, B.L., Dore, J.E., Landscape analysis of greenhouse gas fluxes across complex terrain. 2015 Gordon Research Conference, Catchment Science: Interaction of Hydrology, Biology & Geochemistry.

Kaiser, K.E., McGlynn, B.L., Dore, J.E. Landscape analysis of methane efflux across complex terrain. 2014 CUAHSI biannual meeting.

Kaiser, K.E., McGlynn, B.L., Emanuel, R.E., Assessing Mountain Pine Beetle infestation patterns in space and time using high resolution QuickBird imagery and LiDAR. 2013 AGU Fall Meeting.

Erin C. Seybold, B.L. McGlynn, Zimmer, M.A., **Kaiser, K.E**. Utilizing high frequency in-situ sensor networks to understand carbon and nitrogen dynamics from reach to watershed scales. 2013 AGU Fall Meeting.

Seybold, E.C., **K.E. Kaiser**, B.L. McGlynn, T.P. Covino, D. Riveros-Iregui, L. Liang, R.E. Emanuel, and J.E. Dore. Trace gas fluxes in complex terrain: The space-time dynamics of soil methane, carbon dioxide, and nitrous oxide. 2012 AGU Fall Meeting.

Dore, J.E., B.L. McGlynn, **Kaiser, K.E**., and E.C. Seybold. Constraining Gas Diffusivity-Soil Water Content Relationships in Forest Soils Using Surface Chamber Fluxes and Depth Profiles of Multiple Trace Gases. 2012 AGU Fall Meeting.

Kaiser, K.E., McGlynn, B.L, Emanuel, R.E., Nippgen, F., Mallard J.M. Ecohydrology of an Outbreak: Impacts of vegetation pattern and landscape structure on mountain pine beetle disturbance. 2011 AGU Fall Meeting.

Kaiser, K.E., McGlynn, B.L, Emanuel, R.E., Nippgen, F., Mallard J.M. Ecohydrology: Disturbance and the intersection of vegetation pattern and landscape structure. 2011 European Geophysical Union Spring General Assembly.

Kaiser, K.E., McGlynn, B.L, Emanuel, R.E., Nippgen, F., Mallard J.M. Ecohydrology: Disturbance and the intersection of vegetation pattern and landscape structure. Undergraduate Research Celebration, Montana State University. April 2011

Kaiser, K.E., McGlynn, B.L, Emanuel, R.E., Nippgen, F., Mallard J.M. Ecohydrology: Disturbance and the intersection of vegetation pattern and landscape structure. Montana Space Grant Consortium (MSGC) Student Research Symposium. April 2011.

Kaiser, K.E, Bahn, L. Ecological Informatics: Using Web Technology to Improve Access to Biological Information. 2011 Undergraduate Research Celebration, Montana State University.

TEACHING EXPERIENCE

2020 Software Carpentry: Introduction to R
2019 Software Carpentry: GitHub
2019 HES 697: Agent-Based Modeling of Human-Environment Systems
Guest Lecture: *ABMs for Modeling Water Resources and Land Use Change*
Geoscience 512: Hydrogeology
Guest Lecture: *Richards Equation*
2018 **Instructor of Record**, Human-Environment Systems: Graduate Seminar
2018 HES 697: Agent-Based Modeling of Human-Environment Systems
Guest Lecture: *ABM of Water Resources in the Boise River Basin*
Geoscience 512: Hydrogeology
Guest Lecture: *Equipotential surfaces and Flownets*
2017 **Bass Instructional Fellow**, History 345: North American Environmental History
Guest lecture: *Designer Ecosystems*: *Reconciling Measurements and Management*
2016 **Teaching Assistant** EOS 323: Watershed Hydrology
Guest lecture: *Introduction to hydrologic data analysis using scientific programming languages*
Guest lecture: *Watershed Biogeochemistry*
2015 **Teaching Assistant** EOS 101: Dynamic Earth
2014 **Teaching Assistant** EOS 323: Landscape Hydrology, discussion section lead
2013 **Teaching Assistant** EOS 515: Ecohydrology Field Course
Guest lecture: *Spatiotemporal measurements of soil moisture and greenhouse gas fluxes*

PROFESSIONAL SOCIETIES

American Geophysical Union
American Water Resources Association
Society for Freshwater Scientists

SERVICE

2019 - present **AWRA, Idaho Chapter**
Vice President

2017- present **Reviewer for peer-reviewed journals**
Water Resources Research
Biogeochemistry
JGR- Biogeosciences
Earth System Science Data

2016- 2017 **Duke Water Network**
Networking Liaison

2016- 2017 **Nicholas PhD Advocacy Council**
Earth and Ocean Sciences Program Chair

2014- 2016	**North Carolina Water Resources Association** Membership and Communications Committee
2015	**Let's Talk About Water**: Film Screening and Panel Discussion Funding: $6000 CUASHI Panelists: Robyn Colosimo, Army Core of Engineers; Erin Espelie, Duke Center for Documentary Studies; Matt Stoecker, DamNation Producer; Dave Wegner, Former Assistant Secretary of the Interior and Researcher Additional: Free and open to the public, three short films, and images from the Nicholas School group SNAP (Stories for Nature and People).
	Duke Forest Outreach and Talks
2014	NC School of Math and Science
2013	Haywood Community College & River Center Outreach Day