David Dralle

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Education

Ph.D. Environmental Engineering - UC Berkeley — 2013 – 2016

- Advisor: Sally Thompson
- Hydrology of seasonally dry ecosystems, hillslope hydrology, stochastic ecohydrology, mathematical methods in ecohydrology.

M.S. Applied Mathematics - Columbia University — 2010 - 2011

- Passed doctoral qualifying exam

B.S. Electrical Engineering - University of Illinois — 2003 - 2007

- Summa cum laude

Work and teaching experience

Postdoctoral Researcher at UC Berkeley — 2016 - Present

- Advisor: Bill Dietrich and Sally Thompson
- Lead developer of a semi-distributed, coupled ecohydrologic-stream temperature model for the South Fork Eel River watershed
- Extensions of stochastic hydrologic methods to quantify ecologic risk in Northern California watersheds
- Applications of power law models of the streamflow recession

Visiting Researcher, Helmholtz German Research Center for Geosciences- University of Potsdam, Germany — Summer 2017

- Investigating the origins of power-law streamflow recession behavior

Physics Deep Dive Instructor (concurrent appointment with postdoc) - Engineering Student Services at UC Berkeley — 2016 – 2017

- Supplementary physics instruction targeting students who are members of a group historically under-represented in engineering

Graduate Student Instructor at UC Berkeley — 2015 – 2016

- Surface hydrology (graduate course)
- Introduction to computer programming for scientists and engineers (undergraduate course – Spring 2016)

Mathematics Lecturer for the Pre-Engineering Program, UC Berkeley. 2014, 2015

- Lectured a summer Calculus course targeting incoming engineering students who are members of a group historically under-represented in engineering
- Developed curriculum, assignments, exams, and lectures.

Assistant Professor of Mathematics at Central Oregon Community College, Bend, OR 2011 – 2012

- Student academic advisor
- Taught for one academic year: 3 quarters, 4 courses per quarter (two preps per quarter)

Teaching Assistant at Columbia University 2010 - 2011

- Nonlinear dynamical systems – Fall 2010; Introduction to applied mathematics – Spring 2011

Teen Programs Coordinator at the Santa Barbara Zoo, Santa Barbara, CA 2009 - 2010

- Developed and implemented programming for dedicated teen volunteers from around Ventura County

Counselor in Training Coordinator, Environmental Educator, and Adventure Trips Leader at Frost Valley YMCA, Claryville, NY 2007 - 2009

- Trained, coordinated, supervised, and mentored teen to college aged camp counselors for Frost Valley's Summer Camp
- Taught short environmental science courses for K-12 and college students

Teaching Assistant at the University of Illinois 2007

- Calculus I

Recognition

Outstanding Graduate Student Instructor Award – CE203 Surface Hydrology, UC Berkeley 2016

Outstanding Student Presentation – AGU Fall Meeting 2015

Featured Student and Early Career Scientist – American Geophysical Union 2015

"Best Engineered Award", Senior Design Project, Department of Electrical and Computer Engineering, University of Illinois 2007

Grants and fellowships

National Science Foundation Graduate Research Fellowship Used: 2013 – 2016
Awarded: 2011

Nature Conservancy Field Research Grant – $5,000 2014

Jules Falzer Memorial Scholarship - $3,000 2006

Publications

(* undergraduate or masters student)

D. N. Dralle, W J Hahm, D M Rempe, N J Karst, W E Dietrich, Using ecosystem productivity variability to estimate the subsurface water storage capacity of landscapes, *Science Advances*, in prep.

Hahm W J, **D. N. Dralle,** D M Rempe, W E Dietrich, Water storage limitation limits plant sensitivity to rainfall variability, *Science*, in prep.

Rempe, D M, **D. N. Dralle,** W J Hahm, W E Dietrich, The role of dynamic storage in weathered bedrock on runoff generation, *Water Resources Research*, submitted.

Karst, N J, **D. N. Dralle,** M Müller, Capturing inter-annual streamflow variability to improve annual flow duration curves, *Water Resources Research*, in review.

Chung, M., **D. N. Dralle**, G. Greer, J-P Ore, J. Higgins, C. Detweiler, S.E. Thompson, Advantages and challenges of measuring stream temperatures with an unmanned aerial system, *Ecohydrology,* in review.

Baldcocchi, D., **D. N. Dralle**, G. De Sa Queen, C. Jiang, Y. Ryu, ET, How Much Water is Evaporated Across California? A Multi-Year Assessment Using a Biophysical Model Forced with Satellite Remote Sensing Data, *Environmental Research Letters*, accepted pending minor revisions (2018).

Dralle, D. N., D. Rempe, W. Jesse Hahm, N. J. Karst, W. E. Dietrich, S. E. Thompson, Identifying the dynamic storage that does not drive runoff, *Hydrological Processes*, accepted (2018).

Dralle, D. N., N. J. Karst, M. Müller, G. Vico, and S. E. Thompson, Stochastic modelling of inter-annual variation of hydrologic variables, *Geophysical Research Letters* (2017).

Vico, G., **D. N. Dralle**, X. Feng,, S. E. Thompson, S. Manzoni, How competitive is drought deciduousness in tropical forests? A combined eco-hydrological and eco-evolutionary approach, *Environmental Research Letters* (2017).

D. N. Dralle, N. J. Karst, Charalampous, K.*, A. Veenstra, S. E. Thompson, Event scale power law recession analysis: Quantifying methodological uncertainty, *Hydrology Earth System Sciences* (2017).

Dralle, D. N., Nathaniel J. Karst, and Sally E. Thompson. Dry season streamflow persistence in seasonal climates, *Water Resources Research* (2016).

Dralle, David N., and Sally E. Thompson. A minimal probabilistic model for soil moisture in seasonally dry climates, *Water Resources Research* (2016).

Karst, N. J., **D. N. Dralle,** S. E. Thompson (2016), Spiral and rotor patterns produced by fairy ring fungi, *PLoS One.*

Dralle, D. N., N. J. Karst, S. E. Thompson (2015), a, b careful: The challenge of scale invariance for comparative analyses in power law models of the streamflow recession, *Geophysical Research Letters*, doi: 10.1002/2015GL066007.

Jennifer K. Carah, Jeanette K. Howard, Sally E. Thompson, Anne G. Short Gianotti, Scott D. Bauer, Stephanie M. Carlson, **David N. Dralle**, Mourad W. Gabriel, Lisa L. Hulette, Brian J. Johnson, Curtis A. Knight, Sarah J. Kupferberg, Stefanie L. Martin, Rosamond L. Naylor and Mary E. Power (2015), High time for conservation: Adding the environment to the debate on marijuana liberalization, *BioScience*.

Dralle, D.N., G.F.S. Boisrame, and S.E. Thompson (2014), Spatially variable groundwater recharge and the hillslope hydrologic response: Analytical solutions to the linearized hillslope Boussinesq equation, *Water Resources Research*, doi: 10.1002/2013WR015144.

Müller, M. F., **D. N. Dralle**, and S. E. Thompson (2014), Analytical model for flow duration curves in seasonally dry climates, *Water Resources Research*, 50, doi: 10.1002/2014WR015301.

C. J. Choi, I. D. Block, B. Bole, **D. Dralle**, and B. T. Cunningham, "Label-Free Photonic Crystal Biosensor Integrated Microfluidic Chip for Determination of Kinetic Reaction Rate Constants," IEEE Sensors Journal, vol. 9, pp. 1697-1704, 2009.

Research presentations

Talks

Hillslope water storage that does not drive streamflow: a novel mass- Winter 2017

balance recession technique for quantifying hydraulically decoupled storage , AGU Fall Meeting 2017, New Orleans, LA

Identifying the dynamic storage that does not drive runoff, Geology Seminar, Humboldt State University, Arcata, CA — Fall 2017

Critical Zone attributes drive patterns in streamflow recession data, Environmental Resource Engineering Seminar, Humboldt State University, Arcata, CA — Summer 2017

Streamflow as Critical Zone effluent: Challenges and opportunities for hydrologic modelling, Environmental Engineering Seminar, University of Texas, Austin, TX — Spring 2017

Inter-annual variability of integrated hydrologic variables. Presentation to the California State Water Resources Control Board — Fall 2016

a, b careful!, UC Berkeley Environmental Engineering Seminar Series — Spring 2016

Using Statistical Mechanics and Entropy Principles to Interpret Variability in Power Law Models of the Streamflow Recession. Speaker, American Geophysical Union's Fall Meeting — Fall 2015

Yosemite's Illilouette Creek Basin: Seeing the Forest Without the Trees. Speaker, American Geophysical Union's Fall Meeting — Fall 2014

Seasonal variability in the streamflow recession: consequences and an unexpected pattern. UC Berkeley Environmental Fluid Mechanics meeting — Fall 2014

Does the spatial distribution of vegetation affect baseflow response? Speaker, American Geophysical Union's Fall Meeting — Fall 2013

Science outreach and advising

Research advisor at UC Berkeley — 2014 – present

- Masters research advisor, Gabriella De Sa Queen, UC Berkeley
- Undergraduate research advisor, Andy Nguyen, UC Berkeley
- Undergraduate research advisor, Andrew Veenstra, UC Berkeley
- Undergraduate research co-advisor, Kyriakos Charalampous,

UC Berkeley

- Masters research co-advisor, George Greer, UC Berkeley

AP Environmental Science Speaker, Castro Valley High School, CA — Spring 2015

Volunteer, Bay Area Scientists in Schools (BASIS) — 2013 - 2014

Professional affiliations and service

Organizer – UC Berkeley Earth and Planetary Science – Catchment transit time distributions, reading group — 2017

Convener – AGU Fall Meeting – Stochastic modeling of the hydrosphere and biosphere — 2017

Convener and Session Chair – AGU Fall Meeting – Drought, Groundwater Management, Recharge, Baseflow, and Sustainability: Assessment, Monitoring, Modeling, Planning, and Policy — 2016

Member of the American Geophysical Union — 2012 – Present

Reviewer for *Water Resources Research* — 2014 – Present

Reviewer for *Geophysical Research Letters* — 2016 – Present

UC Berkeley Environmental Engineering Seminar Organizer — 2013