# Curriculum Vitae- JASON KELLEY

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## EDUCATION

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|---|---|---|
| PhD Water Resource Engineering, Minor Soil Science | 2016 | Oregon State University |
| BS *magna cum laude* Ecological Engineering | 2012 | Oregon State University |
| Coursework in Biochemistry/Molecular Biology | 1995-97 | Reed College |

## EMPLOYMENT AND PROFESSIONAL EXPERIENCE

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| March 2018- present | Assistant Professor, University of Idaho |
| November 2016 - February 2018 | USDA-NIFA Post-doctoral Fellow |
| June 2012 - September 2016 | Graduate Research Assistant, Oregon State |
| April 2014 - January 2016 | Restoration Specialist, Lower Columbia Engineering |
| 2010-2013   (3 years, 3 mo.) | Monitoring Associate, Marys River Watershed Council |
| 2009-2010   (1 year) | Research Assistant, Dept. of Civil Engineering, Oregon State |
| 2002-2016   (14 years) | Instrument Technician, Thormahlen Harps |
| 1998-2002   (3 years, 6 mo.) | Asst. Manager, Northern Groves (Production Nursery) |

## AWARDS AND SCHOLARSHIPS

o Post-doctoral Fellowship - USDA National Institute for Food and  Agriculture, 2017
    Competetive Grant, *Funding Awarded $116,931(Sole PD/PI)*
o Myron G. Cropsey Agricultural Engineering Scholarship May 2015
o Oregon State Water Resources Grad. Program- Faculty Award for Excellence May 2014
o Watershed Steward Award, Marys River Watershed Council, 2013
o Edward S. Allen Agricultural Engineering Endowment Award 2010 & 2011

## SERVICE ACTIVITIES & PROFESSIONAL MEMBERSHIPS

o Member, American Society of Biological and Ecological Engineers (Current)
o Member, Soil Science Society of America (Current)
o Member American Meteorological Society
o Member, SWS Hiring Committee 2018
o Member, Industry Exploration Committee, OSU Post-doc Association
o Chair, Student review committees for three tenure/promotion reviews (2010, 2012, 2014) in the
    Dept. of Bio. and Eco. Engineering, OSU
o Student member, Hiring Committee- Geospatial Intelligence group lead (Professor) Aug-Sept. 2012.
    College of Earth, Ocean, and Atmospheric Science OSU
o Technical Reviewer, Bonneville Environmental Foundation. Oregon Model Watershed Monitoring.
o Member Benton County Riparian and Wetland Advisory Group (RWAG) 2010-2013.
o Member Land Use Planning Committee, Oregon Country Fair, 2009-2016.

## CERTIFICATIONS AND PROFESSIONAL TRAINING

o ASCE-EWRI, HECRAS 5.0 Short Course (4.0 PDH) , June 2014
o ESRI Certified Coursework (30 hours), January- March 2013
o OWEB Stream Survey Technician Training, 2011 & 2012
o OPUS Projects Manager Training, US National Geodetic Survey, August 2011

# COURSES TAUGHT & CURRICULA AUTHORED

ASM305 *Precision Agriculture* (UI, Fall 2018) Technology, economics, and environmental aspects of precision agriculture. Co-taught with E Brooks. 18 students

SOIL499 *Irrigation System Design* (UI, Fall 2018) Soil water relations, crop water demand, and hydraulics of irrigation systems. Project based course. 3 students

SOIL599 *Agricultural Physics* (UI, Fall 2018) Graduate course on energy/mass conservation, dynamics, and transport in soil, water, atmosphere and thermodynamic processes.

GE 7049 *Ecohydrology: a Mediterranean perspective* (June 5-20, 2017): Graduate field course co-taught with faculty of Institutionen för naturgeografi, Stockholm University). Navarino Environmental Observatory, Kalamata, Greece. 6 short course participants.

BEE 361/461 *Ecological Engineering Lab* Sp 2013-2017: Undergraduate capstone lab course (taught GPS and total station, GIS, radiometry, eddy covariance) 24-30 students annually

BEE 312: *EcoHydraulics* W 2015. Co-taught with D. Tullos corresponding to engineering hydraulics CE312. Pressurized hydraulics, irrigation, weirs/canals, open channel flow, pumps, hydraluic modelling. 24 students.

BEE 401: *GIS Applications in Ecological Engineering* W and Sp 2015: Advanced GIS course: Cartography and map production; Spatial data analysis; Geodatabase management. 7 students.

# ADVISEES & MENTEES (*Project description* and Current Employment)

2018 Dalyn McCauley - Current Master's student

2017 Taylor Vagher and Willow Walker - *Undergraduate Research Assistants, ANN-ET project*

2017 Johanna Alexson - *Using Accessible Weather Data To Predict Crop Water Requirements* (Completed Master's at Stockholm University, 2017, Sweden; Fulbright applicant for 2018)

2015-16 Natalie McDonald - *Field survey and geostatistical analysis methods to estimate effectiveness of constructed instream log jams* (Currently Paid Intern at Discoll's, Redding CA)

2015 Nicole Fairley - *Surveying and Construction design- Culvert replacement, Oregon Country Fair* (Currently Staff Engineer at California State Water Resource Control Board)

2015 Sonja Michelson - *Surveying and Design of Hydraulic structures for fish passage (Employee/Intern at Lower Columbia Engineering)* (Currently staff engineer, USACE)

2014 Austin Anderson and Thomas Hart - *Cartographic representation and spatial analysis of stream temperature data* (Both currently Lidar Process Technicians at Quantum Spatial)

2014 Missy Buntin - *Methodology and Rules for Change detection in riparian buffers (Benton County Oregon- DEQ compliance)* (Currently Operations Analyst II at Daimler Trucks)

2012-13 Edward (Payse) Smith - *1. Dharma Rain Development- Surface water management and ecological restoration. 2. Matlab methods to determine fluxes from a scalar trace* (Currently Irrigation Operation Technician at Vitality Farms LLC)

2013 Anna Leitschuh - Surveying and *Field construction of stream discharge gauge* (Currently Water Resources Specialist at Collective Water Resources Engineering)

2013 Andrew Kearney - *Precision Irrigation Systems and Market based adoption strategies* (Currently Senior Staff Engineer at Kennedy/Jenks Consultants)

2011-2012 Patrick Haluska - *Stream monitoring Protocol and monitoring* (Currently Hydrologic Technician at USGS Oregon Water Science Center)

# PUBLICATIONS

## Journals Publications and Proceedings

1. Chad Higgins, S. Drake, S. Wharton, H. Oldroyd, D. Jensen, **J. Kelley**. "Atmospheric Response to the 2017 Total Solar Eclipse." Invited Paper, in press. Hydrosphere Frontiers.

2. **Kelley, Jason**, and C. Higgins. "Computational Efficiency for the Surface Renewal Method." *Atmospheric Measurement Techniques* 11, no. 4 (2018): 2151–58. DOI:10.5194/amt-11-2151-2018.

3. Higgins, C. W., M. G. Wing, **J. Kelley**, C. Sayde, J. Burnett, and H. A. Holmes. "A High Resolution Measurement of the Morning ABL Transition Using Distributed Temperature Sensing and an Unmanned Aircraft System." *Environmental Fluid Mechanics 18, no. 3* (2018): 683–93. DOI: 10.1007/s10652-017-9569-1

4. **Kelley, Jason**, T. Vagher, W. Walker, C. Higgins. "Neural Networks and Low Cost Sensors to Estimate Site-Specific Evapotranspiration". Conference Proceedings, *Int'l Meeting of the ASABE*. doi:10.13031/aim.201700694

5. Michael Wing, **J. Kelley**, J. Burnett, C. Higgins, H. Holmes, "A High Resolution Measurement of the Morning ABL Transition Using Distributed Temperature Sensing and an Unmanned Aircraft System" Submitted to *Environmental Fluid Mechanics*. Accepted, in revision.

6. **Kelley, Jason**, Markus Pahlow, C,W. Higgins, J Noller. "Using Apparent Electrical Conductivity to Map Soil Texture: A Case for Regional Data Coordination". 17apr017 in *Soil Science Society of America Journal*. doi: 10.2136/sssaj2016.12.0432

7. Higgins, C.W., **J. Kelley**, C. Barr, C. Hillyer. "Determining the Minimum Management Scale Of a Commercial Variable-Rate Irrigation System", *Transactions of the ASABE*, 59 (5). Dec 2016. DOI 10.13031/trans.59.11767

8. Rodriguez-Nikl, Tonatiuh., **J. Kelley**, Q. Xiao, K. Hammer, and B. Tilt. "Structural Engineers and Sustainability: An Opinion Survey." *Journal of Professional Issues in Engineering Education and Practice*, *141*(3). 2014: 04014011.

## Theses, Technical Reports, and Manuscripts

9. **Kelley, Jason**, C. Higgins "Measuring Evapotranspiration for Agriculture: Current Practices and Future Directions" Invited paper, *Frontiers in the hydrosphere*. **In Preparation.**

10. **Kelley, Jason**, "Surface Renewal in Motion: Fast Measurement to Map Flux" To be submitted to *Agricultural and Forest Meteorology*. **In Preparation.**

11. **Kelley, J.**, "Addressing Data Resolution in Precision Agriculture" (Doctoral dissertation). 2016. Available at: http://ir.library.oregonstate.edu/xmlui/handle/1957/59821.

12. Higgins, Chad, R. Stewart, Z. Liu, **J. Kelley.** "Design Guide For Roadside Infiltration Strips In Western Oregon". Oregon Dept. of Transportation Research Report SPR758. 2016.

13. *Kelley, J.,* S. Bailey. "Patterson Creek Fish Passage Feasibility and Conceptual Design Study". 2015. Lower Columbia Engineering, for Tillamook Estuaries Partnership. Available at : *www.tbnep.org/habitat-enhancement-and-restoration.php*

14. **Kelley, Jason**, K. Marcoe, P. Welle. "Duck Lake Restoration Alternatives and Hydrologic Model". Lower Columbia Engineering and Lower Columbia Estuary Partnership, for Scapoose Bay Watershed Council. Report presented to Bonneville Enviromental Foundation, June 2015.

15. Higgins, Chad, **J. Kelley,** Z. Liu, C. Hillyer. "Using Soil Electrical Conductivity Mapping for Precision Irrigation in the Columbia Basin" Northwest Energy Efficiency Alliance Report #E15-010. 2015. NEEA Reports available at *www.neea.org/resource-center/*

16. Higgins, Chad, C. Barr, C. Hillyer, and **J. Kelley**. "Agricultural Irrigation Initiative: Precision Water Application Test" Northwest Energy Efficiency Alliance Report #E15-009. 2015.

## Conference Presentations and Invited Talks

17. **Kelley, Jason**. " Technology and Technical Skills in Agriculture & Natural Resources". Orofino Correctional Institution Lecture Series, 14August2018.

18. **Kelley, Jason**. "Using Machine Learning to Evaluate Site-specific Crop Coefficients." 01Aug2018, Oral Presentation at Int'l Meeting of ASABE at Detroit MI.

19. **Kelley, Jason**, C. Higgins, S. Drake,. Surface Flux Response During the 2018 Solar Eclipse, (15May2018) Poster presented at Amer. Met. Soc.-Agricultural and Forest Meteorology Conference, Spokane WA.

20. **Kelley, Jason.** "Measuring Site Specific Evapotranspiration using Neural Networks" Invited Presentation for Special Session on Agriculture and ET Measurement at American Water Resources Association Annual Meeting, 07 November 2017.

21. **Kelley, Jason.** "Neural Networks and Low Cost Sensors to Estimate Site-Specific Evapotranspiration" Presented at Amer. Society of Agricultural and Biological Engineers Annual Meeting, 19 June 2017, Spokane WA, USA.

22. **Kelley, Jason.** "Measuring Evapotranspiration in Agriculture: from Penman-Monteith to Surface Renewal " Invited Seminar, Institutionen för naturgeografi, Stockholm University, 16 February 2017.

23. **Kelley, Jason.** "Measuring ET with low cost sensors and neural networks" Invited Seminar in series *Innovations in Water Resource Engineering*, Water Resources Graduate Program, Oregon State University, 18 January 2017.

24. **Kelley, Jason**, C. Barr, C. Higgins, and C. Hillyer. "Verifying Precision Irrigation and Water Use Reduction" Poster presentation at ASCE-EWRI World Environment & Water Resources Conference, 03 June 2015.

25. **Kelley, Jason**. "Maximum Potential Water and Energy Savings from Variable Rate Irrigation". Poster Presentation at *Nexus 2014: Water, Food, Climate and Energy Conference (UNC, Chapel Hill)*, 07 March 2014.

26. **Kelley, Jason**. "Being Effective at Effectiveness Monitoring". Presented at *Building on the Past, Partnering for the Future (Joint Conference of Network of Oregon Watershed Councils and the Oregon Association of Conservation Districts)*. 05 November 2013.

**Conference Presentations and Invited Talks, cont.**

27. Hillyer, Charles, C. Higgins, and **J. Kelley**. 2013 "Catch Can Testing of a Variable Rate Irrigation System and Evaluation Using a Time Varying Densogram." Presented at the Ann. Int'l Meeting of the American Society of Agricultural and Biological Engineers, July 2013.

28. Augerot, Xanthippe, K. Harding, S. Trask, **J. Kelley.** "Sustainable Restoration at the Watershed Neighborhood Scale". Presented at *River Restoration Northwest*, February 2013.

## ANALYSIS METHODS AND COMPUTER PROGRAMS

**QA/QC Methodology for EM Soil Measurements**- automated procedures using Principal Component Analysis, Signal processing techniques, and Neural Networks to validate, flag, and correct raw electromagnetic measurements used to map in situ soil parameters. Software (Matlab) and example data available from the author.

**Micrometeorology and Flux analysis**- Data import and interface, push-pull satellite telemetry, autonomous power system management, energy balance calculations, eddy covariance, Penman-Moneith calculation, flux variance methods. Visualization, error checking, spectral analysis, and long term statistical analysis. Includes footprint calculations authored with Colleen Barr. Custom software authored in Matlab for NEWAg lab at Oregon State. Partly available at: http://hdl.handle.net/1957/60599, with full code (Matlab, Python/C++ implementations in development) available from the author, pending publication.

**DEM analysis and Detection of Riparian areas**- First order calculator for hydraulic and hydrologic model inputs. ArcGIS and C++/Python functions. Results published in Technical report for Tillamook Estuaries Partnership and used in BEE549 Regional Hydrologic Modelling. Methods (ArcGIS toolboxes) and example data available as a downloadable package from the author.

**Signal Processing Techniques for Atmos. Science**- Flux calculations following method of Castellvi and Snyder (2009). Rapid Calculation of structure functions via convolution and "depressed" cubic polynomial using Cardano's solution. Visualization, error checking, spectral analysis, and robustness test for rapid flux calculations. Despiking of big data using parallelized computation. Published in Atmospheric Measurement Techniques. Methods and example data available: Kelley, Jason (2017): *Demonstration data for computational efficiency in surface renewal analysis*. OSU Libraries. https://doi.org/10.7267/N9X34VDS

**Artificial Neural Network Solutions for Farm Water Management**: Open source software to convert low-cost, on-farm sensor data to usable information for decision support. Applicable to irrigation management, material/amendment application, and frost/heat protection. In development, early implementations available through the author.