Curriculum Vitae- JASON KELLEY

PRINCIPAL SCIENTIST/OWNER - ASPERATUS CONSULTING
AGRICULTURAL WATER MANAGEMENT AND ECOHYDROLOGY
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EDUCATION

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

Jan. 2023 - Present	Principal/Owner, Asperatus Consulting, Corvallis Oregon
Jan. 2021-Dec. 2022	Research Agricultural Engineer, USDA-ARS, Parlier California
Mar. 2018- Dec. 2020	Assistant Professor, Dept. of Soil & Water Systems, Univ. of Idaho
Nov. 2016 - Feb. 2018	USDA-NIFA Post-doctoral Fellow, Oregon State University
June 2012 - Sept. 2016	Graduate Research Assistant, Oregon State
April 2014 - Jan. 2016	Restoration Specialist, Lower Columbia Engineering
2010-2013	Monitoring Associate, Marys River Watershed Council
2009-2010	Research Assistant, Dept. of Civil Engineering, Oregon State
2002-2016	Instrument Technician, Thormahlen Harps, Corvallis Oregon
1998-2009	Asst. Manager, Northern Groves Nursery, Corvallis, Oregon

AWARDS AND SCHOLARSHIPS

- Post-doctoral Fellowship - USDA National Institute for Food and Agriculture, 2017
- Myron G. Cropsey Agricultural Engineering Scholarship May 2015
- Oregon State Water Resources Grad. Program- Faculty Award for Excellence May 2014
- Watershed Steward Award, Marys River Watershed Council, 2013
- Edward S. Allen Agricultural Engineering Endowment Award 2010 & 2011

WORKSHOPS, CERTIFICATIONS, AND PROFESSIONAL TRAINING

- FLUXnet Seminar Series and Ameriflux Webinar Series June 2020-Present
- OpenET alpha tester Working Group, July 2020-Present
- Broader Impacts: NSF Advancing Research Impact in Society (NSF-ARIS), November 2019
- NASA Columbia River Basin Needs Assessment Workshop, Portland OR 11-12Sep2019
- Idaho Water Quality Workshop, 29 January 2019 Boise, Idaho
- NSF CAREER, Grant Writers' Seminars and Workshops, LLC, March 2017
- ASCE-EWRI, HECRAS 5.0 Short Course (4.0 PDH) , June 2014
- ESRI Certified Coursework (30 hours), January- March 2013
- OWEB Stream Survey Technician Training, 2011 & 2012
- OPUS Projects Manager Training, US National Geodetic Survey, August 2011

Last updated: 13 Januray 2023

RESEARCH SUPPORT

Funded, In Progress

- USDA-ARS National Project Plan 211: Water Availability and Watershed Management. "*Improving Soil abd Water Productivity and Quality in Irrigated Cropping Systems*" 2034-13000-012-00D. Project funded 2022-2027, Peer review completed February 2022.
- USDA-ARS National Project Plan 215: Grass, Forage and Rangeland Ecosystems. "*Improved Managementand Quality of Alfalfa for Dairies in the Western U.S.*" 2034-13210-001-00D. Project funded 2021-2024, Peer review of ad-hoc extension in process.
- NASA Western Water Applications Office (JPL) "*Accuracy Assessment of Satellite-based ET mapping for improved water and nutrient management in the Magic Valley".* Pilot project funded 2021-2022. PI Erin Brooks (UI), project partners USDA-NRCS, Idaho Dairymen's Association, USDA-ARS.

Completed

- Oregon Watershed Enhancement Board Grant #219-5046-16676 *"Towards sustainable groundwater management- Monitoring Evapotransipration in the Harney Basin".* Co-PI with Justin Huntington (DRI) and Jordan Beamer (OWRD). Project Award $146,670.
- 2020 UI Presidential Initiative on Water and Sustainability *"Managing Water and Regenerating Degraded Soils in SensorCentric Irrigated Cropping Systems"* . Co-PI with Erin Brooks (UI) and Linda Schott (UI Extension). Project Award $22,685.
- USDA/ODA Oregon Specialty Crop Block Grant *"Promoting Sensor-Based Irrigation Management"* PI Lloyd Nackley (Oregon State University). Project Award $152,098.
- UI-ARES Research Support *"Idaho Center for Center for Agriculture, Food and the Environment - Irrigation, Water use, and Atmospheric science*" PI Kelley, Co-PI Rick Allen Project Award $96,220. Completed in 2020.
- UI-ORED Equipment Support Award *"Northern Idaho Agricultural Weather Network - Pilot Implementation"* Sole PI. Project Total $39,943. Completed 2019
- USDA-NIFA Award # 2017-67012-26125 *"Integrating On-Farm Information to Optimize Water Management"* Sole PD. Project Award $116,931. Completed in 2018.
- Tillamoook Estuaries Partnership (Contract for services), "Patterson Creek Fishh Passage Feasibility and Conceptual Design Study (Phase 1)". Project Manager for Lower Columbia Engineering, project budget $67,764. Completed in 2015.

Submitted, but not funded

- American Vineyard Foundation - *Use of soil amendments for vineyard pest and disease management*. PI Edwin Lewis, Total project budget $45,112. Spending Authority $23k.
- USDA Specialty Crop Block Grant - *Detection and Management of Phylloxera and Other Root Damaging Pests in Idaho Vineyards.* PI Kelley (co-PI Lewis), Total budget $154,558. (Letter of Intent and Draft Budget)
- NIH COBRE - *Center for Precision Agriculture To Human Health (CPATH2)* PI Shirley Luckhart (UI). Total project budget $10.9M. Spending authority $737,727.
- Keck Foundation - *How Wildland Fires Drive Biological Teleconnections among Ecosystems through Smoke.* PI Leda Kobziar (UI). Total budget $1M, Spending authority $150,000

- USDA SAS - *Transformative Research, Education, and Outreach Towards Sustainable and Resilient Dryland Agro-ecological Systems in the Pacific Northwest*. PD Jan Boll (WSU). Total Project Budget $7.6M. Spending authority $130,000.
- USDA Signals in the Soil - *Leveraging Information by Linking Scales in Soil Water Measurement and Management.* Co-PIs Kelley and Jason Karl. (Letter of Intent)
- NOAA SARP/NIDIS - *Development of a UAV-based Decision Support to Mitigate Drought Impact on Rangeland Communities in a Changing Climate.* PI Jae Ryu. (Letter of Intent)

SERVICE ACTIVITIES & PROFESSIONAL MEMBERSHIPS

- Chair/convener, Fluxnet Extension and Outreach Committee (starting in 2023)
- Member, American Society of Biological and Ecological Engineers (2014-2021)
- Member, Soil Science Society of America (2017-2021)
- Member, Agronomy Society of America (2017-2021)
- Member American Meteorological Society (2017-2021)
- Member, America Geophysical Union (2012-2019)
- Member, ASABE Organizing Committee, 2nd Int'l Conference on Evapotranspiration
- Member, SWS Administrative Hiring Committee (2020)
- Member, Water Resources Director Hiring Committee (2019)
- Member, SWS Faculty Hiring Committee (2018)
- Member, Water Resources Graduate Curriculum Committee (2019-Present)
- Chair (ad-hoc), Ag. Systems Mgmt Curriculum Committee (2018-Present)
- Member, University of Idaho Drone Lab
- Member, SWS Department Safety Committee (2018-2019)
- Member, Industry Exploration Committee, OSU Post-doc Association
- Chair, Student review committees for Faculty P&T (2010, 2012, 2014) BEE Dept. OSU
- Student member, Hiring Committee- Geospatial Intelligence Chair 2012. CEOAS, OSU
- Technical Reviewer, Bonneville Environmental Foundation. Oregon Model Watershed. 2012
- Member, Benton County Riparian and Wetland Advisory Group (RWAG) 2010-2013.
- Member, Land Use Planning Committee, Oregon Country Fair, 2009-2016.
- Journal Reviewer *Computers and Electronics in Agriculture*
- Journal Reviewer MDPI journals: *Agronomy*, *Water*, and *Envr. Research and Public Health*
- Journal Reviewer *Agricultural and Forest Meteorology*
- Journal Reviewer *Transactions Amer. Society of Agriculutral and Biological Engineers*
- Journal Reviewer *Hydrology and Earth System Sciencess*
- Journal Reviewer *Journal of Hydrology*

COURSES TAUGHT

WR 504 *Agricultural Water Management* (University of Idaho, Fall 2020) Enrollment 4. Taught in Conjunction with / LAW946 *Water Law, Enrollment 17*

SOIL504 *Environmental Data Analysis* (University of Idaho, Spring 2020) Enrollment: 2

ASM315 *Irrigation and Agricultural Water Management* (UI, Fall 2019) Enrollment: 23

ASM331 *Electrical Power Systems* (University of Idaho, Fall 2019) Enrollment: 18

COURSES TAUGHT, cont.

ASM305 *Precision Agriculture* (UI, Fall 2018) Technology, economics, and environmental aspects of precision agriculture. Co-taught (50%) with Dr. E. Brooks. Enrollment: 18

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

SOIL599 *Agricultural Physics* (UI, Fall 2018) Graduate course on energy/mass conservation, dynamics, and transport in soil, water, atmosphere and thermodynamic processes. Enrollment:1

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. Enrollment: 6

BEE 361/461 Ecological Engineering Lab Oregon State University 2013-2017: Instructor of Record C. Higgins. Undergraduate capstone lab course (taught GPS and total station, GIS, radiometry, eddy covariance) 24-30 students annually

BEE 312: EcoHydraulics Oregon State University 2015. Instructor of record: D. Tullos. Co-developed course replacing engineering hydraulics CE312. Pressurized hydraulics, weirs, canals, open channel flow, pumps, hydraulic modelling. I developed course materials for pressurized hydraulics sections. Enrollment: 24

BEE 401: GIS Applications in Ecological Engineering Oregon State University 2015 Cartography/map production; Spatial data analysis; Geodatabase management. Enrollment:7

ADVISEES & MENTEES (*Project description* and Employment following mentorship)

2021-present Arman Ahmadi - UC Davis BAE PhD Student *Machine Learning applications for estimating crop ET* (Graduate Committee, student advised by Dr. Andre Daccache)

2020-present Mathilde Jome - Engineering Intern Universite Toulouse *Artificial Intelligence for Estimating Atmospheric Flux* (Research advisee, Student advised by Dr. Fabienne Lohou)

2020-present Bailey Olson - Water resources Engineering Master's Thesis title: *Soil Infiltration Model of Irrigated Areas of Eastern Snake Plain* Graduated November 2021. (Faculty Research Assistant NASA funded project in Magic Valley, Idaho)

2018-2020 Danny Baldwin - Undergraduate Research Assistant, NID Pilot Weather Station (Graduate Student Univ. Idaho)

2018-2020 Dalyn McCauley - Water Resources Engineering Master's student (Graduate Major Advisee) Recipient of the Harris Fellowship (METER). Thesis title:*Sensor-based management of Powdery Mildew in Idaho Vineyards* Graduated May 2020 (Faculty Research Associate at OSU Research and Extension, Aurora Oregon)

2017 Taylor Vagher - Undergraduate Research Assistant*, ANN-ET project*

2017 Willow Walker - Undergraduate Research Assistants*, ANN-ET project.* (Staff Engineer, USACE, Walla Walla District)

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

ADVISEES and MENTEES, cont.

2015 Nicole Fairley - *Surveying and Construction design- Culvert replacement, Oregon Country Fair* (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)* (Staff engineer, USACE)

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

2014 Missy Buntin - *Methodology and Rules for Change detection in riparian buffers (Benton County Oregon- DEQ compliance)* (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* (Irrigation Operation Technician at Vitality Farms LLC)

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

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

2011-2012 Patrick Haluska - *Stream monitoring- Willamette Model Watershed* (Hydrologic Technician at USGS Oregon Water Science Center)

PUBLICATIONS

Refereed Journal Publications

1. **Kelley, Jason**, Olson, B., 2022. Interannual variability of water productivity on the Eastern Snake Plain in Idaho, United States. Agricultural Water Management 265, 107532. https://doi.org/10.1016/j.agwat.2022.107532
2. Mangan, M.R., Oldroyd, H.J., Paw U, K.T., Clay, J., Drake, S.A., **Kelley, J**., Suvočarev, K., 2022. Integrated Quadrant Analysis: A New Method for Analyzing Turbulent Coherent Structures. Boundary-Layer Meteorology 1–25. DOI: 10.1007/s10546-022-00694-w
3. McCauley, Dalyn. M., Nackley, L.L., **Kelley, J.**, 2021. Demonstration of a low-cost and open-source platform for on-farm monitoring and decision support. Computers and Electronics in Agriculture 187, 106284. DOI: 10.1016/j.compag.2021.106284
4. **Kelley, Jason**. 2020. Assessment and Correction of Solar Radiation Measurements with Simple Neural Networks. Atmosphere 11, 1160. DOI: 10.3390/atmos11111160
5. **Kelley, Jason**, McCauley, D., Alexander, A., Gray, W., Siegfried, R., Oldroyd, H.J., 2020. Using Machine Learning to Integrate On-Farm Sensors and Agro-Meteorology Networks into Site-Specific Decision Support. Transactions of the ASABE 63. DOI: 10.13031/trans.13917
6. **Kelley, Jason**, and Pardyjak E.R., 2019 "Using Neural Networks to Estimate Site-Specific Crop Evapotranspiration with Low-Cost Sensors." *Agronomy* 9, no. 2: 108. DOI:10.3390/agronomy9020108.

PUBLICATIONS, cont.

7. Higgins, Chad W., Stephen A.D., **Kelley, J.**, Oldroyd H.J., Jensen D.D., and Wharton, S., 2019. "Ensemble-Averaging Resolves Rapid Atmospheric Response to the 2017 Total Solar Eclipse." *Frontiers in Earth Science* 7: 198. DOI:10.3389/feart.2019.00198.
8. **Kelley, Jason**, and C. Higgins. 2018 . "Computational Efficiency for the Surface Renewal Method." *Atmospheric Measurement Techniques* 11, no. 4. DOI:10.5194/amt-11-2151-2018.
9. Higgins, Chad W., Wing M. G., **Kelley J.**, Sayde C., Burnett J., and Holmes H. A., 2018. "A High Resolution Measurement of the Morning ABL Transition Using Distributed Temperature Sensing and an Unmanned Aircraft System." *Environmental Fluid Mechanics 18, no. 3*: 683–93. DOI: 10.1007/s10652-017-9569-1
10. **Kelley, Jason**, Pahlow M., Higgins C,W., Noller, J., 2017 "Using Apparent Electrical Conductivity to Map Soil Texture: A Case for Regional Data Coordination". *Soil Science Society of America Journal*. DOI: 10.2136/sssaj2016.12.0432
11. Higgins, Chad W., **Kelley J.**, Barr C., Hillyer C., 2016. "Determining the Minimum Management Scale Of a Commercial Variable-Rate Irrigation System", *Transactions of the ASABE*, 59 (5). DOI: 10.13031/trans.59.11767
12. Rodriguez-Nikl, Tonatiuh., **Kelley J.**, Xiao Q., Hammer K., and Tilt B., 2014. "Structural Engineers and Sustainability: An Opinion Survey." *Journal of Professional Issues in Engineering Education and Practice*, *141*(3): 04014011.

Manuscripts in Review

13. **Kelley, Jason**. "Machine Learning Model of Soil Heat Flux and Delayed Closure of the Surface Energy Budget." Submitted to *Agricultural and Forest Meteorology* September 2022.
14. Olson, Bailey O, Mohammed Z.A., Brooks, E., **Kelley J.**, "Deep Infiltration Model to Quantify Water Use Efficiency of Center-Pivot Irrigated Alfalfa.", Submitted to *Agricultural Water Management* August 2022.

Theses, Proceedings, Technical Reports, and Manuscripts in Preparation

15. **Kelley, Jason**, Russell E., Lima P., "Generalized Deep Learning Algorithms to Estimate Soil Heat and Soil Water Flux in Agricultural Soils."In preparation to be submitted to *Advances in Water Resources* March 2022.
16. **Kelley, Jason**, Suvokarev K., Oldroyd HJ., "Error Imposed in Eddy-covariance and Surface Renewal Methods by Despiking Algorithms". In preparation to be submitted to *Atmospheric Measurement Techniques* April 2022.
17. **Kelley, Jason**, Eric Russell, Erin Brooks, and Jan Boll. "Potential Evapotranspiration and Long-term Energy Balance at a LTAR Flux Monitoring Site". In preparation to be submitted to *Agricultural and Forest Meteorology*.

PUBLICATIONS, cont.

18. **Kelley, Jason**, Dalyn McCauley, G. Aaron Alexander, Rylie Siegfried, and Holly J. Oldroyd. "Using Machine Learning to Integrate On-Farm Sensors and Ag-Weather Networks into Site-Specific Decision Support" *Proceedings of the 6th Decennial National Irrigation Symposium*. San Antonio, Texas, 30 Nov 2020. doi:10.13031/irrig.20-105 (Conference delayed to 2021)
19. **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*. (2017) doi:10.13031/aim.201700694
20. **Kelley, J.**, "Addressing Data Resolution in Precision Agriculture" (Doctoral dissertation). 2016. Available at: http://ir.library.oregonstate.edu/xmlui/handle/1957/59821.
21. 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.
22. **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*
23. **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.
24. 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/*
25. 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 Seminars

26. **Kelley, Jason**., "ET-based Irrigation and Water Stress Management". Oregon Nut Growers Association Winter Meeting, Corvallis, Oregon, January 12 2023.
27. Yuan, Yusen, Ajami H., Anderson R.A., Wang D., **Kelley J.**, Wang L., "Quantifying Citrus Water Use by In-situ Evapotranspiration Partitioning", American Geophysical Union, December 2022.
28. **Kelley, Jason.** "Principles and Measurement of Evapotranspiration". Invited Workshop, World Alfalfa Congress, San Diego November 14 2022.
29. **Kelley, Jason.** "Research Advances in ET based water management". Quarterly meeting of the California Specialty Crop Commission, November 9 2022.
30. **Kelley, Jason**, "Satellite-based Monitoring in Managing California's Agricultural and Water Resources", Invited seminar, UC Merced Environmental Systems Graduate Group, Aug 2022.
31. Jome, Mathilde, Lohou F., Lothon M., **Kelley J.**, Pardyjak E., "Using Artificial Neural Network to Estimate Surface Convective Fluxes.", European Geophysical Union, May 2022.

PUBLICATIONS, cont.

32. **Kelley, Jason** "Using Machine Learning to Integrate On-Farm Sensors and Ag-Weather Networks into Site-Specific Decision Support" *ASABE/IA 6th Decennial National Irrigation Symposium*, San Diego California, 06-08 December 2021.
33. **Kelley, Jason**, "Water Situation in the West and Impacts on Forages", *2021 Western Alfalfa and Forage Symposium*. Reno, Nevada, 16 November 2021
34. **Kelley, Jason**, "Measuring Daily Alfalfa Transpiration and Soil Evaporation", at UC Extension Alfalfa and Forage Field Day, Kearney Agriculture Research and Extension Center, Parlier, California, 23 September 2021
35. **Kelley, Jason.** "Using on-site weather in irrigation scheduling software". Part of UI Extension workshop *Water and Weather: Sustainable Irrigation Systems for Small Farms and Market Gardens*. Moscow, Idaho, 01 March 2020.
36. **Kelley, Jason**."Pragmatic Engineering Practices in Environmental Engineering", UI Biological Engineering Seminar, University of Idaho. 24 February 2020.
37. **Kelley, Jason**. "Using Data Science Tools to Expand Agro-meteorological Networks and Engage Stakeholders in Collaboration". Annual Meeting of the Amer. Geophysical Union. San Francisco, California, 12 December 2019.
38. Stephen A. Drake, E. Pardyjak, C. Higgins, M. Calaf, S. Wharton, T. Morrison, A. Perelet, G. Iungo, M. Puccioni, M. Hultmark, Y. Huang, C. Brunner, F. Margairaz, **J. Kelley**, H. Oldroyd, "A Comparative Assessment of TKE Terms for Two Near-canonical Sites", Annual Meeting of the American Geophysical Union, Washington D.C., 10 December 2019.
39. McCauley, Dalyn, and **Kelley, Jason**. "Initial Results of Using Canopy Reflectance and Distributed Sensor Stations to Monitor Crop Damaging Events", Int'l Meeting of ASABE, Boston MA, 09 July 2019.
40. **Kelley, Jason**. "Drought Stress Effect on Observed Surface Energy Balance Closure", Int'l Meeting of ASABE, Boston MA, 09 July 2019.
41. **Kelley, Jason**. "Collaborating with Ag Producers to Leverage On-Farm Weather Data" Int'l Meeting of ASABE, Boston MA, 09 July 2019.
42. **Kelley, Jason**. "Data-driven Agriculture & On-Farm Collaboration", Meeting of the Climate Impact Research Consortium (Invited), Corvallis, Oregon, 18Jun2019**.**
43. **Kelley, Jason**. "Using neural networks for data assimilation and analysis", Annual UI Data Science Symposium (Invited), Moscow Idaho 16May2019.
44. **Kelley, Jason**. " The Importance of Meta-Data in Interdisciplinary Collaborations" (Invited Seminar), Department of Plant Sciences, UC Davis, 14 March 2019.
45. **Kelley, Jason**. "Bridging Research and Practice in Agriculture and Water Resources" (Invited Seminar), Department of Plant Sciences, UC Davis, 13 March 2019.
46. **Kelley, Jason**. Supporting Site-Specific Agriculture with 'Medium Data'" (Invited Seminar), WSU Crop & Soil Sciences Seminar Series, 03 March 2019.

PUBLICATIONS, cont.

47. **Kelley, Jason**. "Technology and Technical Skills in Agriculture & Natural Resources". Orofino Correctional Institution Lecture Series, 14 August 2018.
48. **Kelley, Jason**. "Using Machine Learning to Evaluate Site-specific Crop Coefficients.", Int'l Meeting of ASABE, Detroit MI, 01 August 2018.
49. **Kelley, Jason**, C. Higgins, S. Drake,. Surface Flux Response During the 2018 Solar Eclipse, (Poster) American Meteorological Society - Agricultural and Forest Meteorology Conference, Spokane WA, 15May2018.
50. **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.
51. **Kelley, Jason.** "Neural Networks and Low Cost Sensors to Estimate Site-Specific Evapotranspiration" Amer. Society of Agricultural and Biological Engineers Annual Meeting, Spokane WA, USA, 19 June 2017.
52. **Kelley, Jason.** "Measuring Evapotranspiration in Agriculture: from Penman-Monteith to Surface Renewal " (Invited Seminar), Institutionen för naturgeografi, Stockholm University, 16 February 2017.
53. **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.
54. **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.
55. **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.
56. **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.
57. 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.
58. Augerot, Xanthippe, K. Harding, S. Trask, **J. Kelley.** "Sustainable Restoration at the Watershed Neighborhood Scale". Presented at *River Restoration Northwest*, February 2013.

ANALYTIC 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, energy balance calculations, eddy covariance, Penman-Moneith calculation, flux variance methods. Visualization, error checking, spectral analysis. Partly available at: http://hdl.handle.net/1957/60599, with full code (Matlab, Python/C++ implementations in development) available from the author.

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 Atmospheric 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. 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 Intelligence/Deep Learning in Hydrologic modelling: Customized Matlab software applications to convert low-cost, on-farm sensor data into usable information for decision support. Applicable to irrigation management, material/amendment application, and frost/heat protection. Long-term/Short-term Memory solution for partial differential equations governing heat and mass transfer in soils.