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Karen L. Vaughan

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RESEARCH INTERESTS

Application of pedological concepts and tools to solve environmental problems; hydric and hydromorphic soils; influence of climate on edaphic factors and vegetation communities; landscape evolution; tephra-influenced soils; application of geospatial tools in soil science; digital soil mapping; soil mineralogy; proximal sensing; and natural resources education.

EDUCATION

Ph.D.	2008	Soil Science, University of Idaho, Moscow <i>Pedogenesis at Craters of the Moon National Monument and Preserve</i>
M.S.	2004	Soil Science, University of Maryland, College Park <i>Hydromorphology of Mid-Atlantic Piedmont Floodplain Soils</i>
B.S.	2001	Wildlife Conservation, University of Delaware, Newark
B.S.	2001	Entomology, University of Delaware, Newark

PROFESSIONAL EXPERIENCE

Assistant Professor of Pedology (2015 - present)

University of Wyoming, Laramie, WY

I conduct research and teach in the areas of environmental pedology, hydric and hydromorphic soils, and natural resources education. A combination of field, laboratory, and computer-based studies are conducted to elucidate critical issues in pedology. Extramural funding is secured to support research, scholarly activities, and graduate students. The results of this research are published in peer-reviewed journals and other appropriate outlets. Participation at research conferences, professional meetings, and other venues allows for the dissemination of research findings.

Assistant Professor of Soil Science (2011 - 2015)

California Polytechnic State University, San Luis Obispo, CA

This position was 100% teaching with expectations for scholarship. Teaching responsibilities included Introduction to Soil Science, Soil Morphology, Soil Ecology, Wetlands, Soil Judging, and Senior Project I and II. My role as an undergraduate advisor included oversight of two Natural Resource Management and Environmental Sciences student clubs, mentoring of undergraduate research, and specialized curricular advice in soil and earth sciences. Other service activities include FFA Land Judging Contest coordinator and host, Indigenous Studies in Environmental Sciences minor committee member, earth and soil science curriculum committee member, new student enrollment taskforce committee member, and Employment Equity Facilitator for the NRES department. Advised graduate students through direct mentorship and guidance of research projects in soil science as well as through service on graduate committees. Research performed on anomalous hydric soils, digital soil mapping and predictive modeling, pedogenesis in saline vernal pools, soil-vegetation relationships, Indicator of Reduction in Soil tubes, and S biogeochemistry.

Soil Scientist (2008 - 2011)

USDA-NRCS Snow Survey Program and Soil Climate Analysis Network - Salt Lake City, UT

Responsible for the operation, maintenance, and data analyses at the 35 Soil Climate Analysis Network (SCAN) stations in Utah and soil information and sensors at 150 Snowpack-Telemetry (SNOTEL) stations in Utah, Nevada, western Wyoming, and eastern California. Worked with rangeland ecologists to produce ecological site descriptions at SCAN and SNOTEL sites in order to develop state and transition models. Collaborated with hydrologists, agronomists, land managers, biologists, and ecologists to identify the importance of using soil climate information to improve our understanding of relationships between soil and vegetation communities, snow hydrology, and improved agricultural practices. Examined the influence of edaphic factors on sagebrush and aspen vegetation community establishment; vegetation encroachment at high elevation, snowfall-dominated SNOTEL stations; and variability in soil climatic conditions in adjacent meadow, aspen, and conifer communities.

Graduate Research Assistant (2004 - 2008)

University of Idaho - Moscow

Developed and executed a research study that examined secondary mineral synthesis along a chronosequence of basaltic cinder cones using a combination of techniques including selective dissolutions and total elemental digests. Investigated processes involved in organic and mineral soil succession on Holocene-aged lava flows. Through an agreement with the National Park Service and Natural Resources Conservation Service, determined volcanic-ash influence throughout Craters of the Moon National Monument and Preserve and identified sources of ash via electron microscopy. Evaluated vegetated and non-vegetated cinder cone surfaces using GPR and automated water content measurements in order to elucidate the edaphic controls on plant communities in arid climates. Teaching assistant/instructor for the Soil Ecosystem Laboratory 2004 - 2006.

Inland Northwest Research Alliance - Subsurface Science Graduate Fellow (2006 - 2008)

University of Idaho - Moscow

Participated in an interdisciplinary program entitled Terrestrial Subsurface Processes. Research and discussion topics included geology, vadose zone processes, soil chemistry, subsurface microbiology, kinetics, and flow and transport. Collaboration between graduate students and faculty at eight universities in the inland northwest was facilitated through scheduled meetings, field trips, in-class lectures, and online discussion forums. Subsurface transport of contaminants was the focus of the course and integrated projects. In-situ microbial and chemical remediation techniques were examined and transport models were applied in heterogeneous subsurface environments.

Soil Scientist (2004)

Bluefields, Nicaragua

Collaborated with a tropical forest ecologist from Hood College and researchers from the University of the Autonomous Regions of the Caribbean Coast of Nicaragua (URACCAN) to produce a first-order soil survey of two, eight-hectare plots located in lowland tropical rainforests on the Atlantic coast of Nicaragua. A soil sampling strategy was developed and implemented in an effort to establish recruitment limitation factors of three tropical tree species.

Graduate Research Assistant (2001 - 2004)

University of Maryland - College Park

Determined the relationship between duration of soil saturation and Fe reduction in hydric and non-hydric soils. Developed a new hydric soil field indicator that was accepted as an indicator for soils on Mid-Atlantic Piedmont floodplains. Performed an extensive field sampling and monitoring program in order to link soil

processes with environmental conditions and water table dynamics. Mineralogy and micromorphology of soil profiles were comprehensively described using thin-sections, X-ray diffraction, selective dissolutions, and grain counts.

Ecological Restoration - Student Conservation Association/AmeriCorps (2001)

Big Cypress National Preserve - Ochopee, FL

Initiated a six-month study on the effects of off-road vehicles on soil compaction in saturated and unsaturated soils. Responsibilities included performing plant, soil, and biological inventories; aiding in the construction of an authorized trail system; removing unnatural human influences; eliminating invasive exotic plants; fighting wildland fires; studying fire ecology; and revegetating disturbed areas.

REFEREED PUBLICATIONS

13. **Vaughan, K.**, P. McDaniel, S. Blecker, D. Strawn. 2018. Soil evolution and mass flux of basaltic cinder cones in a cool, semi-arid climate. *Soil Sci. Soc. Am. J.* 82:1177-1190. doi:10.2136/sssaj2018.02.0071. open access at <https://bit.ly/2S9ulfU>
12. Vågen, T., L. Winowiecki, W. Twine, and **K. Vaughan**. 2018. Spatial gradients of ecosystem health indicators across a human-impacted semi-arid savanna. *J. Env. Qual. Special section: Predicting soil organic carbon in agroecosystems under climate change. J. Environ. Qual.* 47:746-757. doi:10.2134/jeq2017.07.0300 open access at <http://bit.ly/2GKZdhe>
11. Brevik, E., **K. Vaughan**, S.J. Parikh, H. Dolliver, D. Lindbo, J. J. Steffan, D. Weindorf, P. McDaniel, M. Mbila, and S. Edinger-Marshall. 2018. Trends in undergraduate soil science education at selected universities in the USA - the 2009-2013 academic years. *Soil Sci. Soc. Am. J.* 82:295-306. doi:10.2136/sssaj2017.10.0346
10. **Vaughan, K.**, R. Vaughan, and J. Seeley. 2017. Experiential learning in soil science: Use of an augmented reality sandbox. *Nat. Sci. Educ.* 46:1-5. doi:10.4195/nse2016.11.0031 open access at <http://bit.ly/2y9rgSY>
9. Verma, P., **K. Vaughan**, K. Martin, E. Pulitano, J. Garrett, and D. Piirto. 2016. Integrating indigenous knowledge and western science into forestry, natural resources, and environmental programs. *J. For.* 114:648-655.
8. **Vaughan, K.**, F. Miller, N. Navarro, and C. Appel. 2016. Visual assessment of sulfate reduction to identify hydric soils. *Soil Sci. Soc. Am. J.* 80:1114-1119. doi:10.2136/sssaj2016.02.0035 open access at <http://bit.ly/2gJEdKp>
7. Appel, C., **K. Vaughan**, B. Swan, M. Wallace, C. Stubler, and P. Verma. 2014. Effect of a soil microbial activity laboratory on student learning. *NACTA J.* 58:129-134.
6. **Vaughan, K.L.**, P.C. McDaniel, and W. Phillips. 2011. Episodic soil succession on basaltic lava fields in a cool, dry environment. *Soil Sci. Soc. Am. J.* 75:1462-1470.
5. Baker, L.L, D.G. Strawn, **K.L. Vaughan**, and P.A. McDaniel. 2010. XAFS study of Fe mineralogy in a chronosequence of soil clays formed in basaltic cinders. *Clays and Clay Minerals.* 58:772-782.
4. **Vaughan, K.L.** and P.A. McDaniel. 2009. Organic soils on basaltic lava flows in a cool, arid climate, Craters of the Moon National Monument and Preserve, Idaho, USA. *Soil Sci. Soc. Am. J.* 73:1510-1518.
3. **Vaughan, K.L.**, M.C. Rabenhorst, and B.A. Needelman. 2009. Saturation and temperature effects on the development of reducing conditions in soils. *Soil Sci. Soc. Am. J.* 73:663-667.

2. **Castenson*, K.L.**, and M.C. Rabenhorst. 2006. Indicator of reduction in soil (IRIS): Evaluation of a new approach for assessing reduced conditions in soil. *Soil Sci. Soc. Am. J.* 70:1222-1226.
1. Rabenhorst, M.C., and **K.L. Castenson***. 2005. Temperature effects on iron reduction in a hydric soil. *Soil Sci.* 170:734-744.

* maiden name

PUBLICATIONS IN REVIEW OR PROGRESS

King, M. and **K.L. Vaughan**. Limitations to redoximorphic feature development in highly calcareous wetlands. *In review at SSSAJ*.

Vaughan, K., H. Van Miegrot, A. Pennino, C. Duball, Y. Pressler, C. Olson, A.A. Berhe, E. Brevik. Women in soil science: Growing participation, emerging gaps, and opportunities for advancement. *In review at SSSAJ*.

Pennino, A. and **K.L. Vaughan**. Early stage soil development following geomorphic reclamation. *In progress*. Planned submission to SSSAJ.

Ash-Kropf, Z., **K.L. Vaughan**, and L. van Diepen. Impacts of multi-scale climatic shifts on pedogenesis in high alpine regions of the Rock Mountains, Wyoming, USA. *In progress*. Planned submission to Arctic, Antarctic, and Alpine Research.

Vaughan, K., T. Cullum-Muyres, J. DeMoss, and A. Namm. Organic carbon masking redoximorphic features in C-rich hydromorphic soils. *In progress*. Planned submission to SSSAJ or Wetlands.

BOOK CHAPTERS

1. Vepraskas, M. and **K. Vaughan**. 2016. Morphological Features of Hydric and Hydromorphic Soils. *In* Richardson, J. and M. Vepraskas (Eds.) *Wetland Soils: genesis, hydrology, landscapes, and classification*. 2nd ed. CRC Press. Boca Raton, FL.

OTHER PUBLICATIONS

10. King, M. and **K. Vaughan**. 2018. Hydromorphology of Highly Calcareous Hydric Soils in Western Wyoming. National Cooperative Soil Survey Newsletter. Issue 83.
9. Sever, K., A. Steinert, S. Melzer, and **K. Vaughan**. 2018. Agencies and Universities Team Up to Offer a Soil Survey Field Practicum in Dinosaur National Monument. National Cooperative Soil Survey Newsletter. Issue 85.
8. United States Department of Agriculture, Natural Resources Conservation Service. 2017. Field Indicators of Hydric Soils in the United States, Version 8.0. L.M. Vasilas, G.W. Hurt, and J.F. Berkowitz (eds.). USDA-NRCS, in cooperation with the **National Technical Committee for Hydric Soils**. Washington, DC.
7. Hmielowski, T. 2017. Teaching soils with an Augmented Reality Sandbox. *CSA News*. 62: 8.
6. **Vaughan, K.L.** 2016. Visual assessment of sulfate reduction to identify hydric soils. *CSA News*. 61: 10.
5. **Vaughan, K.** and R. Vaughan. 2016. Quantification of outcomes generated using multi-scale geomorphic classification systems in predictive and update modes of digital soil mapping: Part 1: Data mining and interpretation of *Official Soil Series Descriptions* for multi-scale geomorphic descriptive information. Final Report submitted to USDA-NRCS Soil Science Division.

4. **Vaughan, K.L.** and R. Julander. 2010. Relationship between climatic conditions and soil properties at SCAN and SNOTEL sites in Utah. Proceedings of the 78th Western Snow Conference, pp 4121-4125. Logan, Utah.
3. **Vaughan, K.L.** 2008. Pedogenesis of volcanic soils at Craters of the Moon National Monument and Preserve, Idaho. Ph.D. dissertation. University of Idaho. <http://bit.ly/2gW8q8l>
2. **Vaughan, K.L.** and M.C. Rabenhorst. 2006. IRIS Tubes: A simple, robust tool that promotes the identification of reduction in soil. CSA News. 51: 8.
1. **Castenson, K.L.** 2004. Hydromorphology of Mid-Atlantic Piedmont Floodplain Soils. M.S. thesis. University of Maryland. <http://drum.lib.umd.edu/handle/1903/1354>

TEACHING

Courses taught at the University of Wyoming

- REWM 1000 Wyoming Wildlands - 3 credits, co-instructor (fall 2018)
- SOIL 4120/5120 Soil Morphology and Genesis lecture and 2, 4-hr laboratory sections - 4 credits (fall 2015, 2016, 2017, 2018)
- SOIL 2010 Introduction to Soil Science lecture and 3, 3-hr laboratory sections - 4 credits (spring 2016, 2017, 2018, 2019)
- SOIL 4590/5590 Soil Morphology Field Experience at Dinosaur National Monument, weekly meetings plus 5-day field course in DNM with Colorado State University and the National Park Service - 1 credit (fall 2017, 2018)
- SOIL 4590 Soil Judging - 1 credit (spring 2016, 2017, 2018, 2019; fall 2016, 2017, 2018)

Courses taught at the University of Alaska, Fairbanks

NRM 489/489 Arctic Soils Field Morphology - summer 2018 (co-instructors Kholdov & Weindorf)

Courses taught at California Polytechnic State University

SS 121 Introduction to Soil Science lecture and laboratory - 4 cr.; SS 321 Soil Morphology lecture and laboratory - 4 cr.; SS 400 Special Topics for Advanced Undergraduates; SS/NR 421 Wetlands lecture and laboratory - 4 cr.; SS 422 Soil Ecology lecture and laboratory - 4 cr.; SS 444 Soil Judging - 2 cr.; SS 461 Senior project I - 1 cr.; SS 462 Senior project II - 1 cr.; SS 463 Senior project III - 1 cr.; SS 500 Individual study in soil science; SS 600 Graduate thesis research.

AWARDS AND RECOGNITION

- Early Career Faculty Own It! Awardee through the Wyoming EPSCoR. 2019.
- Awarded as "Top Prof" by The Cap and Gown Chapter of Mortar Board at the University of Wyoming. 2019.
- Nominated for the COANR Lawrence Meeboer Classroom Teaching Award. 2018.
- Nominated for Early Career Faculty Own It! Award through the Wyoming EPSCoR. 2018.
- #273 of 365 Women in STEM, <https://twitter.com/365womeninSTEM/status/938118965246808064>, 2017.
- Identified as one of "13 Soil Scientists Driving Sustainability" by foodtank, <https://foodtank.com/news/2017/12/sustainable-soil-scientists/>, 2017.

- Selected as Research Mentor for Wetland Ambassadors Graduate Research Fellowship through the Society of Wetland Scientists international student exchange. 2017.
- Popular press article was written about my publication: Hmielowski, T. 2017 Teaching soils with new technology. CSA News.
- Nominated for Early Career Faculty Own It! Award through the Wyoming EPSCoR. 2017
- President's Diversity Award for work in creating a new minor, Indigenous Studies in Natural Resources at California Polytechnic State University. 2016 (together with Verma, Pulitano, Martin, and Piirto)
- Wyoming Women in Science and Engineering (WWISE) travel grant, Wyoming EPSCoR. 2016
- Nominated (not awarded) for the University of Wyoming, College of Agriculture and Natural Resources Lawrence Meeboer Agricultural Classroom Teaching Award. 2015
- Soil Science Society of America, Association of Women Soil Scientists Mentoring Award. 2013
- Utah NRCS representative for the Emerging Leadership Development Program, USDA-NRCS. 2010
- Presentation Excellence Award, Graduate Student Expo, University of Idaho. 2008
- Leadership Award, Graduate and Professional Student Association, University of Idaho. 2008
- Western Society of Soil Science, first place award for presentation excellence. 2007
- American Association for the Advancement of Science (AAAS) Pacific Division, Robert I. Larus Award for best overall student presentation. 2007
- Pacific Northwest Society of Wetland Scientists Student Travel Scholarship. 2007
- Inland Northwest Research Alliance Graduate Fellowship. 2007
- Research Excellence Award, Graduate Student Expo, University of Idaho. 2007
- Inland Northwest Research Alliance Graduate Fellowship. 2006
- Teaching Excellence Award, University of Idaho. 2005

GRANTS AWARDED

1. UW Libraries Alt-Textbook Grant Proposal; 2019; Enhancement of student learning through the generation of interactive, 3D models for soil science; PIs: K. Vaughan & R. Aleman; \$3,000.
2. Hatch- McIntire Stennis; 2019-2023; Carbon Dynamics and Hydromorphology in Depressional Wetland Systems; Co-PIs: P. Drohan, J. Galbraith, M. Rabenhorst, L. Spokas, M. Stolt, J. Thompson, B. Vasilas, and K. Vaughan.
3. UW Libraries Alt-Textbook Grant Proposal; 2019; Creation of an Alternative, Open Soil Ecosystem Laboratory Manual; PI: K. Vaughan; \$3,000.
4. B.L. Allen endowment, Texas Tech. University; 2019-2021; #willrunforsoil film development; PIs: K. Vaughan and Y. Pressler; \$25,000 (KV allocation \$25,000).
5. United States Department of Agriculture, Natural Resource Conservation Service; 2019-2020; Soil Geomorphology Institute; PI: K. Vaughan; \$40,000 (KV allocation \$40,000).
6. University of Wyoming Under-Represented Domestic Minority Graduate Students Recruitment and Mentoring; 2018-2020; Request for Soil Science M.S. assistantship; PI: K. Vaughan; \$50,862 (KV allocation \$50,862).

7. United States Department of Agriculture, NIFA; University of Wyoming Agricultural Experiment Station (McIntire-Stennis). 2018. Center of Excellence: Sustainable extensive rangeland agricultural systems in high altitude headwater areas. Co-PIs: G.B. Paige, L.P. Ritten, J. Beck, W. Stewart, J.D. Scasta, B. Meador, M. Murphy, S. Lake, S. Paisley, K. Vaughan, R. Coupal, T. Collier, A. Latchinsky; \$50,000.
8. Biodiversity in the Arts Grant Program; 2018-2019; SOIL: the rainbow beneath; Co-PIs: K. Vaughan and D. Baumbach; \$5,000.
9. University of Wyoming Under-Represented Domestic Minority Graduate Students Recruitment and Mentoring; 2017-2020; Request for Soil Science Ph.D. assistantship; PI: K. Vaughan; \$50,862 (KV allocation \$50,862).
10. Wyoming NASA Space Grant Consortium, Faculty Research Initiation Grant; 2017-2018; Development of spatially explicit riparian classification maps using structure from motion photogrammetry; PI: K. Vaughan; \$18,483.
11. Wyoming NASA Space Grant Consortium, Faculty Education Enhancement Grant; 2017-2018; Advancing STEM education through the development of an integrative science communication course; PI: K. Vaughan; \$10,000.
12. University of Wyoming Faculty Grant-In-Aid; 2017-2018; Climatic controls on wetland biogeochemistry, hydrology, and function; PI: K. Vaughan; \$7,465.
13. University of Wyoming Quaternary Studies - Roy Shlemon grant; 2017-2018; Aeolian influence on soil evolution in high-alpine permafrost-affected ecosystems; Co-PIs: K. Vaughan, Z. Ash-Kropf, and L. van Diepen; \$10,000.
14. Bureau of Land Management National Landscape Conservation System Research Support Program; 2016-2017; Developing an Inventory and Monitoring Framework of Herbaceous Riparian Wetlands in the National Trails Management Corridor of the Upper Sweetwater River Basin, Wyoming; PI: J. Norton; \$25,000 (KV allocation ~\$9,500).
15. College of Agriculture and Natural Resources Student Technology Experience; 2017; Development and use of a Google Cardboard learning environment; Co-PIs: K. Vaughan and M. Murphy; \$10,000 (KV allocation \$5,000).
16. Wyoming Department of Environmental Quality, Abandoned Mine Lands; 2016-2018; Geomorphic reclamation and landscape heterogeneity: An efficacy assessment of vegetation heterogeneity, geomorphic stability, wildlife habitat, and economics; PI: P. Stahl; \$207,115 (KV allocation ~\$70,000).
17. UW College of Agriculture and Natural Resources Global Perspectives Grant Program; 2016-2017; International collaboration with World Agroforestry Centre (ICRAF) scientists: Environmental and human-induced drivers of soil organic carbon in savanna ecosystems; PI: K. Vaughan; \$4,000 (KV allocation \$4,000).
18. Wyoming National Science Foundation EPSCoR Outside-the-Box Grants; 2016-2017; Spatial distribution of alpine permafrost and its influence on mountain hydrology and climate change in the Snowy Range Mountains, Wyoming; Co-PIs: K. Vaughan & L. van Diepen; \$ 49,885 (KV allocation ~\$25,000).
19. College of Agriculture and Natural Resources Education Enhancement; 2016; Introduction to Soil Science laboratory enhancement request; PI: K. Vaughan; \$12,000 (KV allocation \$12,000).

20. University of Wyoming Under-Represented Domestic Minority Graduate Students Recruitment and Mentoring; 2017-2019; Request for Soil Science Ph.D. assistantship; PI: K. Vaughan; \$50,862 (KV allocation \$50,862).
21. Ellbogen Center for Teaching and Learning Professional Development Mini-Grants, University of Wyoming; 2015; Augmented Reality Sandbox construction; PI: K. Vaughan; \$1,500.
22. Research, Scholarly, and Creative Activities Grant Program, California Polytechnic State University; 2014; Variability of Soil Redoximorphic Feature Expression in Seasonal Wetlands; PI: K. Vaughan; \$13,440.
23. Agricultural Research Institute, California State University; 2014-2016; Development and documentation of a standard for visual sulfur reduction to identify seasonally inundated wetlands; PI: K. Vaughan; \$40,000.
24. United State Department of Agriculture - Natural Resources Conservation Service in coordination with Oregon State University; 2013-2015; Quantification of outcomes generated using multi-scale geomorphic classification systems in predictive and update modes of digital soil mapping; Co PIs: J. Noller & K. Vaughan \$94,074 (KV allocation \$49,208).
25. Agricultural Research Institute, California State University; 2012-2013; Soil Science New Investigator Funding; PI: K. Vaughan; \$5,000.
26. Oreggia Foundation, California State University; 2011-2015; Soil Science Research Funds; PI: L. Moody; \$40,000 (KV allocation \$40,000).
27. University of Idaho Student Grant Program; 2007-2008; Organic soil formation on Holocene-aged basaltic lava flows at Craters of the Moon National Monument and Preserve; PI: K. Vaughan; \$1,500.
28. Sustainable Idaho Initiative; 2007; Soil Stewards, student-run organic farm: Advancing sustainable food systems and experiential education opportunities on the University of Idaho campus; Co PIs: J. Johnson-Maynard & K. Vaughan; \$7,500.
29. United State Department of Agriculture - Natural Resources Conservation Service in coordination with the National Park Service; 2005-2007; Andisol pedogenesis at Craters of the Moon National Monument and Preserve; Co PIs: P. McDaniel & K. Castenson (Vaughan); \$22,000.

ADDITIONAL FUNDING AWARDED

University of Wyoming, School of Energy Resources; Funds awarded to the University of Wyoming Soil Judging Team to participate in the National Collegiate Soil Judging Competition hosted by California Polytechnic State University in San Luis Obispo, CA; April 2019; \$7,500.

University of Wyoming, School of Energy Resources; Funds awarded to the University of Wyoming Soil Judging Team to participate in the National Collegiate Soil Judging Competition hosted by University of Tennessee in Martin, TN; March 2018; \$6,500.

University of Wyoming, School of Energy Resources; Funds awarded to the University of Wyoming Soil Judging Team to participate in the National Collegiate Soil Judging Competition hosted by Northern Illinois University in Dekalb, IL; April 2017; \$6,500.

GRANTS IN PROGRESS OR REVIEW

Wyoming NASA Space Grant Consortium, Faculty Education Enhancement Grant; 2019-2020; Development and implementation of immersive virtual reality experiences in the ecosystem sciences; PI: K. Vaughan; \$10,000. Submitted March 2019.

USDA-NRCS Soil and Plant Science Division; 2019-2021; Quantification of redoximorphic feature expression; PI: K. Vaughan; \$100,000. Submitted February 2019.

Natural Resources Stewardship and Science Directorate, United States Department of Interior, National Park Service; 2019-2021; Ecosystem function and resistance to change at Craters of the Moon National Monument and Preserve; Co-PIs: K. Vaughan, G. Eckert, R. Vaughan. On hold pending approval to submit.

GRANTS SUBMITTED (NOT AWARDED)

1. University of Wyoming Science Initiative; 2019-2021; Impacts of human-ecological interactions on thresholds across gradients in fragmented landscapes; PI: K. Vaughan; Co-PIs: M. Murphy, J. Norton, K. Wilcox; \$90,000. Submitted February 2019.
2. USDA NIFA Higher Education Challenge Grants; 2019-2021; Developing a Next-Generation Open and Accessible E-Textbook to Advance Soil Science Education; PI: C. Moorberg; Co-PIs: K. Vaughan, T. Hartshorn, D.G. McGahan, Y. Sanchez de Leon, S. Hai-Jew; \$750,000.
3. Letter of Intent for the USDA-NIFA Agricultural and Food Research Initiative Competitive Grants Program - Sustainable Agricultural Systems, FY 2018 RFA. Impacts of selecting for feed efficient females in range-based domestic livestock operations on the meat supply chain across the US and subsequent impacts on natural resource quality in the Western US; Co-PIs: Ritten and Paige.
4. University of Wyoming Quaternary Studies - Roy Shlemon grant; 2018-2019; Biogeochemistry of FeS in arid-land wetland ecosystems: Towards improving wetland functional understanding; Co-PIs: K. Vaughan and C. Duball; \$12,000.
5. Bureau-wide National Conservation Lands Scientific Studies Support Program; 2017-2019; Current and Potential Soil Health and Productivity in the National Trails Management Corridor, Wyoming; Co-PIs: K. Vaughan, J. Norton, and S. Miller, \$25,000.
6. National Science Foundation Long-term Ecological Research Site Program; 2017-2023; LTER: Ecological interactions in a warming shrub steppe landscape; PI: R. Hall; \$5,400,000.
7. Agriculture and Food Research Initiative; 2017-2022; Spatial Variability of Soil Health as Affected by Landform-Management Interactions in Sagebrush-Steppe Rangelands; PI-Jay Norton; \$499,997.
8. W.M. Keck Foundation, Undergraduate Education Grant Program; 2017-2020; Wyoming Environmental Science and Technology Institute (WEST); Co-PIs: K. Vaughan and D. Wachob; \$350,000.
9. Wyoming NSF EPSCoR pre-proposal; 2017-2023; Collaborative Lab for Promoting Wyoming STEAM Initiatives (WySTEAM CoLLab) Wyoming EPSCoR EOD (Broader Impacts); PI: B. Gellis; \$468,475.
10. Wyoming NSF EPSCoR Seed Grant Opportunity; 2016-2017; Influence of edaphic factors on hydromorphology of wetland soils; PI: K. Vaughan; \$49,866.
11. University of Wyoming Faculty Grant-In-Aid; 2016-2017; Influence of edaphic factors on redoximorphic feature formation in wetland soils; PI: K. Vaughan; \$7,500.
12. University of Wyoming Agricultural Experiment Station; 2015-2017; Grazing strategy and wetland ecosystem function along rangeland riparian corridors; PI: J. Norton; \$90,000.

ADVISEES GRANTSMANSHIP & AWARDS (STUDENT LED SUBMISSIONS)

Research Grants: (1) Society of Wetland Scientists graduate research grant; 2018-2019; Quantification of iron monosulfide expression in arid-land wetlands; PI: Chelsea Duball; \$1,000 awarded; (2) Berry Center Biodiversity Grant; 2017-2018; *Soil Microbial Community Diversity and Function in Recently Thawed High-Alpine Permafrost Soils*; PI: Zoe Ash-Kropf; \$8,000 awarded; (3) WyomingView Grant, Wyoming Geographic Information Science Center (WyGISC); November, 2017; PI: Amanda Pennino; \$500 awarded.

Fellowships and Scholarships: (1) Mary Mead Wyoming Graduate Scholarship for Women in Agriculture, University of Wyoming; July 2017; PI: Amanda Pennino; \$1200; (2) Soil Science Society of America (SSSA) Wilford Gardner Travel Fellowship; summer 2018; PI: Chelsea Duball; \$1,500 awarded.

Awards and Travel Grants: (1) Memorial Scholarship, Amer. Soc. for Mining and Reclamation (ASMR); June 2018; PI: Amanda Pennino; \$1500 awarded; (2) Best oral presentation, Amer. Soc. for Mining and Reclamation (ASMR); June 2018; PI: Amanda Pennino; \$250 awarded; (3) Graduate student travel grant, Amer. Soc. for Mining and Reclamation (ASMR); June 2018; PI: Amanda Pennino; \$250 awarded; (4) Gerald Schuman Soil Science Graduate Student Award, Soils Faculty at University of Wyoming; May 2018; PI: Amanda Pennino; \$1200 awarded; (5) Wyoming Women in Science and Engineering (WWISE) travel grant, Wyoming EPSCoR; spring 2017; PI: Amanda Pennino; \$1,000 awarded; (6) Graduate student travel grant, Amer. Soc. for Mining and Reclamation (ASMR); April 2017; PI: Amanda Pennino; \$250 awarded; (7) Second place poster presentation, Amer. Soc. for Mining and Reclamation (ASMR); April 2017; PI: Amanda Pennino; \$200 awarded (8) Student travel grant, Wyoming Soil and Water Conservation Society; October 2016; PI: Amanda Pennino; \$300 awarded.

ADVISING & MENTORING

University of Wyoming

- Faculty advisor to the UWYO Soil Science Club and Soil Judging Team (2016 – present)
- Graduate research mentoring:
 - Ruben Aleman (Ph.D.) (January 2019 - present); dissertation: TBD
 - Anna Schwyter (M.S.) (August 2018 - present); thesis: TBD
 - Chelsea Duball (Ph.D.) (August 2017 - present); dissertation: S biogeochemistry in wetlands of arid regions
 - Michael Kasten (M.S.) (July 2016 – August 2018); thesis: Evaluation of soils and wetland plant community composition in the National Trails Management Corridor of the upper Sweetwater River Basin, Wyoming
 - Zoe Ash-Kropf (M.S.) (July 2016 – May 2018 with Dr. Linda van Diepen); thesis: Spatial distribution of alpine permafrost and its influence on mountain hydrology and climate change in the Snowy Range Mountains, Wyoming
 - Amanda Pennino (M.S.) (August 2016 – August 2018); thesis: Geomorphic reclamation and landscape heterogeneity: An efficacy assessment of vegetation heterogeneity, geomorphic stability, wildlife habitat, and economics
 - Matthew King (M.S.) (August 2016 – May 2018); thesis: Hydromorphology of calcareous soils in western Wyoming
- Graduate student committees:
 - Sarah Binti-Maarof Granke (M.S.) Major Professor: Cliff Riebe (2019-present)
 - Than Thi Ndoc Dam (Ph.D.) Major Professor: Mengqiang Zhu (2018-present)
 - Colleen Friday (M.S.) Major Professor: Derek Scasta (2017-present)

- Elizabeth Traver (Ph.D.) Major Professor: Linda van Diepen (2016-present)
- Peng Yang (Ph.D.) Major Professor: Mengqiang Zhu (2016-present)
- Russell Callahan (Ph.D.) Major Professor: Cliff Riebe (2015-present)
- Qian Wang (Ph.D.) Major Professor: Mengqiang Zhu (2017-2018)
- Chueng Ho (Ph.D.) Major Professor: Mengqiang Zhu (2015-2018)
- Undergraduate research mentoring
 - Caleb Gray - incubation pH to estimate S influence (2018)
 - Taylor Kepley - microbial community dynamics in calcareous hydromorphic soils (2018)
 - Zoe Sherman - microbial community dynamics (2018)
 - Emma Fox-Fogle - microbial community dynamics (2018)
 - Jenna Brown - spatial variability of soil biogeochemical properties (2018)
 - Taylor Bush - Pedology research assistant (2017) and development of introductory soil science laboratory activity using UHandy microscope (2018)
 - Taylor Cullum-Muyres - Problematic serpentinitic hydric soils (2017)
 - Casey Campbell - NRCS Pathways soil science intern (2016)
- Academic advisor to 5, 10, 7 undergraduate students (2016, 2017, 2018)
- Undergraduate laboratory and field research assistants: Joshua Fearing (2018); Ethan Rowe, Taylor Bush, Taylor Kepley (2017); Taylor Cullum-Muyres, Kaitlyn Hoffman (2016); Alex Foulk (2015).

Previous Institution

- Faculty advisor to the Cal Poly Earth, Soil, and Water Conservation Club (2012 - 2015), Geology Club (2013 - 2015), and Soil Judging Team/Club (2012 - 2015).
- Faculty advisor to approximately 80 undergraduate students majoring in soil science or earth science at Cal Poly annually.

Undergraduate research mentoring (2012-2014): *continued to graduate school

- Adrian Gallo* - California Polytechnic State University (2013); Seasonal soil moisture and temperature variation of timber stands with varying canopy structure in SW Oregon.
- Scott Pensky* - California Polytechnic State University (2013); Seasonal soil moisture and temperature variation of timber stands with varying canopy structure in SW Oregon.
- Yamina Pressler* - California Polytechnic State University (2013); Nitrogen cycling in well-developed cyanobacterial biological soil crusts under varied moisture conditions
- Andrew Ritenour - California Polytechnic State University (2013); Studying the efficacy of vermicompost for greenhouse tomato seedling growth
- Maria Hassett - California Polytechnic State University (2013); The effects of recycled water irrigation on soil salinity and plant health
- Laurie Fraser* - California Polytechnic State University (2014); Using soil maps to prevent sudden oak death: Map analysis of four coastal California counties to determine influence of soil and landscape characteristics of *Phytophthora ramorum* chlamydospore survival.
- Max Ross* - California Polytechnic State University (2014); Sampling of soil profiles on Cal Poly campus
- Josh Fridlund - California Polytechnic State University (2014); The effect of increasing rates of biochar on corn growth in Salinas clay loam
- Jason DeMoss - California Polytechnic State University (2014); Utilizing Indicator of Reduction in Soils Tubes to Affirm a Serpentinitic Hydric Soil on the California Central Coast

- Nico Navarro* - California Polytechnic State University (2015); Development and Documentation of a Standard for Visual Sulfur Reduction to Identify Seasonally Inundated Wetlands
- Florence Miller* - California Polytechnic State University (2015); Development and Documentation of a Standard for Visual Sulfur Reduction to Identify Seasonally Inundated Wetlands
- Kathryn Grossmith - California Polytechnic State University (2015); The Collection and Analysis of Soil Sites on the Cal Poly Campus
- Graduate research mentoring:
 - Mark Gormley (M.S.) *The influence of hydrogeomorphology, soil redox conditions, and salinity on the spatial zoning of vegetation at Scott's Creek Marsh, Swanton Pacific Ranch, California*. Major Professor: Dr. Karen Vaughan (2011-2013)
 - Ariel Namm (M.S.) *Serpentinitic problematic hydric soils in a Mediterranean Climate along the Central Coast of California*. Major Professor: Dr. Karen Vaughan (2012-2014)
- Graduate student committees:
 - Mary Crable (M.S.) *Evaluating five years of soil hydrologic response following the 2009 Lockheed Fire in the coastal Santa Cruz Mountains, California*. Major Professor: Dr. Brian Dietterick (2011-2014)
- Instructed students as assistant or head coach in regional and national soil judging competitions Storrs, CT (2001), State College, PA (2002), Minneapolis, MN (2002), Narragansett, RI (2003), College Station, TX (2003), San Luis Obispo, CA (2006), Bend, OR (2006), Logan, UT (2007), Ontario, OR (2007), and Narragansett, RI (2008).

PROFESSIONAL SERVICE ACTIVITIES

- Earth Science Women's Network member (2019 - present)
- Science advisory board member Carbon180 soil carbon project (2019 - present)
- Member of the University of Wyoming Academic Planning Committee (2017-present)
- Founding board member of the Wyoming Science Communication Initiative (2017 - present)
- Recognition and Representation Taskforce Committee Member, Soil Science Society of America (2018 - present)
- Soil Science Society of America, Pedology Division Chair (2017) and Past Chair (2018)
- USDA-NRCS Soil Science Division, Initial Mapping Focus Team member (2017 - present)
- Reviewer for Soil Science Society of America, Catena, Geoderma, Journal of Environmental Quality, Soil Use and Management, The Holocene, and Biogeochemistry.
- Advancing Pedology Colloquium Committee, Soil Science Society of America (2016-2018)
- William H. Patrick Memorial Lectureship Committee, Soil Science Society of America (2016-2018)
- USDA-NRCS National Technical Committee for Hydric Soils, elected academic representative (2013 - present)
- National Collegiate Soil Judging Contest Committee - region 6 representative, Soil Science Society of America (2013 - present)
- Soil Science Society of America member (2001 - present); Invited member of the Early Career Member Taskforce (2010-2011); Invited member of the SSSA Reorganization Taskforce (2011-2014); Invited member of the Early Career Member Advisory Committee to the SSSA Board of Directors (2010-2013).
- Western Society of Soil Science (2004-2012)

- Western Snow Conference Association (2010-2013)
- Society of Wetland Scientists (2004-present)
- Association of Women Soil Scientists (2006-present)

COMMUNITY AND CAMPUS OUTREACH

- Presented and shared VR technology at the Tech Jumpstart: a free open house showcasing classroom technology available on campus for students and educators. COE Student Innovation Center (Dec. 2018).
- Formalized the Wyoming Science Communication Initiative (WYSCI) <http://www.uwyo.edu/wysci/about/meet-wysci.html> (2018)
- Together with WYSCI, hosted Sharing Science: A panel on professional implications of engaging with policy makers (October 2018).
- Guest lecture for an ART course - Color theory (D. Baumbach) on the Importance of color in soil science (October 2018).
- Native American Summer Institute academic workshop host: *Exploring the world beneath your feet: the soil ecosystem*. University of Wyoming. Developed and delivered soil science and hydrology materials and activities to high school students participating in the Institute (June 2018).
- Staffed and displayed the UWYO Pedology Augmented Reality Sandbox at the Wyoming EPSCoR Own It! Pop-up Discovery Center Event (2018).
- Invited speaker at the University of Wyoming Haub School Career Series (2018).
- @uwyopedology Instagram account <https://www.instagram.com/uwyopedology/> with ~1000 followers and more than 240 posts in 2018.
- Collaborative project in progress with the Shell 3D Visualization Center on the development of an interactive soil profile interface with Emma Jane Alexander, Kyle Summerfield, and Emily Bean (2017 - present).
- College of Agriculture and Natural Resources Strategic Planning Committee (2017).
- Guest lecture in BOT 5780 - Biogeochemistry (D. Williams), February 28, 2017.
- Development of a Science Communication Initiative (WYSCI) at UW (July 2017 - present).
- Google Cardboard Expeditions displayed at the UW Geological Museum for the Wyoming Rocks Event. 250 people engaged (2017, 2018).
- Augmented Reality Sandbox travelled to Jackson Wild Festival with Laura Vietti. 600 people engaged. (Sept/Oct 2017; 2018).
- Hosted Dr. David Weindorf at the screening of "Between Earth and Sky" at the Berry Center followed by a reception at the UW Geological Museum. (September 2017).
- Haub School of Environment and Natural Resources, Natural Resource Recreation and Tourism faculty curriculum committee member (2017).
- Soil science for preschoolers - invited and hosted preschoolers from the Early Care and Education Center to the Introductory Soil Science lab in STEM 235 (July 2017).
- Staffed and displayed the UWYO Pedology Augmented Reality Sandbox at the Wyoming EPSCoR Own It! Pop-up Discovery Center Event. (April 2017).

- Interview entitled *Soil Science chose me* by 500 Women Scientists
<https://500womenscientists.org/updates/2017/3/19/soil-science-chose-me> (March 2017).
- In collaboration with the Haub School, School of Energy Resources, and the Ecosystem Science and Management Department (Scott Miller), coordinated and planned the Showcase Saturday event for potential students interested in Outdoor and Environmental Degrees at UWYO (January 2017).
- Invited to display the UWYO Pedology Augmented Reality Sandbox at the Tri-Societies Booth at ASA-CSSA-SSSA, Phoenix, AZ (2016).
- Participated in and displayed the Augmented Reality Sandbox to the Women in STEM Conference for Junior High and High School Students, University of Wyoming, Wyoming NASA Space Grant Consortium (2016).
- Delivered *Incorporating Experiential Learning in Soil Science Education: Use of an Augmented Reality Sandbox* presentation at the ECTL Active Learning Symposium (2016).
- WORMS and SOIL - explored the wonderful belowground world with toddlers at the University of Wyoming Early Childhood Education Center (2016).
- Organized and hosted the California State FFA Land Judging Competition at Cal Poly (2014, 2015).
- Environmental Earth Science for fourth graders from San Luis Obispo County Schools (2013).
- Agriculture Development for Afghanistan Pre-Deployment (ADAPT) Training instructor (2013).
- WORMS - explored the wonderful world of worms with toddlers at the ASI Children's Center at Cal Poly (2012, 2013, 2014, 2015).
- NRES Enrollment Taskforce member (2011) - Responsible for identifying ways to increase enrollment in all NRES majors.
- NRES Mission and Vision Statement Taskforce member (2011) - Responsible for developing a recommendation for the new mission and vision statement for the NRES department.
- Green Career Day at Thanksgiving Point (2010) Lehi, UT - Discussed environmental career opportunities with Utah high school students.
- Soil Science education for third graders at Rose Wagner Elementary (2010) Salt Lake City, UT - Taught third grade class about the importance of the environment and soil health.
- Encouraged Earth team volunteers to assist in soil descriptions and sampling at SNOTEL and SCAN sites (supervised 4 volunteers in 2009-2010).
- Soil Science education for second graders at West Park Elementary (2007) Moscow, ID - Taught second grade classes about the importance of the environment and soil health.
- Soil Stewards Farm Field Day (2007) Moscow, ID - Presented information about the soil fertility and morphology on the University of Idaho student-run organic farm.
- El Segundo Taller de Suelos (2007) Talamanca, Costa Rica - Assisted a colleague in preparing and hosting a workshop for a Cabécar indigenous community about the importance of soil fertility on their farms.
- Community supported agriculture coordinator (2007) Moscow, ID - Liaison between community shareholders and student members of the Soil Stewards.
- Mountain biking through Thailand (2007) Moscow, ID - Informal presentation to the Moscow Grange Chapter.

- Backyard Harvest (2006-2008) Moscow, ID - Delivered and organized the weekly donation of produce grown by the Soil Stewards to Backyard Harvest who then distributed produce to regional food banks.

TRAININGS AND WORKSHOPS

- Participated in the WySci Lab-based Research Photography Workshop (November 12, 2018)
- Completed the Workforce Diversity Training (2018)
- Participated in the WySci Sharing your science: A panel on the professional implications of engaging with policy makers (October 30, 2018)
- Participated in the workshop, Demystifying the Media, University of Wyoming (2018)
- Attended the Sci-Art Exploratorium hosted by the UW Art Department, University of Wyoming (2017)
- Storytelling Science through Film workshop participant, Wyoming EPSCoR, resulted in the production of a short film entitled: Science for All (<https://vimeo.com/205465224>) (2017)
- UW Laboratory Safety Training (2017)
- Grant Writers' Workshop - University of Wyoming (2016)
- Field tour of problematic calcareous hydric soils of western Wyoming in conjunction with the USDA-NRCS and BLM range and soil scientists - Pinedale, WY (2016)
- Tips and Tricks for Actively Engaged Learning - University of Wyoming, Ellbogen Center for Teaching and Learning (2015)
- Employment Equity Facilitator Training - California Polytechnic State University (2014)
- USDA-NRCS Emerging Leadership Development Program - Potomac, MD (2011)
- CPR and First Aid - America Red Cross (2011)
- NASCA National Conservation Partnership Leadership Training - Louisville, KY (2010)
- All-Terrain Vehicle Training - ATV Safety Institute (2010)
- Aviation Safety - Interagency Aviation Training (2010)
- Introductory Helicopter Flight Training, Upper Limit Aviation, Utah (2009)
- Tower Climbing Safety and Rescue - Boise, ID (2009)
- Snow Safety and Survival School - Tahoe City, CA (2009)
- 7th Biennial Conference on University Education in Natural Resources - Corvallis, OR (2008)
- Radiation Safety Training - University of Maryland (2002) and University of Idaho (2007)
- Grant Writing Workshop - University of Idaho (2007)
- Ground-penetrating radar and electromagnetic induction training - James Doolittle, NRCS (2006)
- Cultural Resources Training - Bureau of Land Management, Shoshone, ID (2005)
- Teaching Assistant Training - University of Idaho (2004)
- Grantsmanship Workshop - University of Maryland (2004)
- Wildland Fire Safety Training and Red-Card certification - Big Cypress National Preserve, FL (2001)

PRESENTATIONS & ABSTRACTS

1. Ayayee, P., A. Schwyter, **K. Vaughan**, and L. van Diepen. 2019. Temporal and spatial patterns of microbial structure and function in montane wetlands. Ecological Society of America. Louisville, KY. Poster presentation.
2. Pennino, A., **K. Vaughan**, and K. Fleisher. 2019. Dynamic soil properties and vegetative establishment following geomorphic reclamation in Wyoming. Soil Science Society of America. San Diego, CA. Oral presentation
3. **Vaughan, K.**, P. Drohan, J. Galbraith, M. Rabenhorst, L. Spokas, M. Stolt, J. Thompson, and B. Vasilas. 2019. Redoximorphic feature expression in seasonally inundated soils reveals belowground climatic influence on development. Soil Science Society of America. San Diego, CA. Oral and poster presentation.
4. Duball, C. and **K. Vaughan**. Iron Monosulfide Is the New Black: Quantifying FeS in Freshwater, Saline Wetlands. Soil Science Society of America. San Diego, CA. Oral and poster presentation.
5. Kholodov, A., S. Natali, M. Loranty, **K.L. Vaughan**, D.C. Weindorf, B. Sharenbroch, M. McKenzie, and B. Bevacqua. 2019 Influence of ground thermal and moisture regime on soil processes within the discontinuous permafrost zone of interior Alaska. Soil Science Society of America. San Diego, CA. Oral presentation.
6. Acree, A., T. Blackman, D. Brumm, C. Duball, H. Dolliver, J. Fiola, A. Kholodov, J. Kraklow, R. Lybrand, V. Monsaint-Queeney, D. Nicolsky, L. Paulette, A. Pennino, J. Peralta, E. Rooney, B. Scharenbroch, D. Schulze, **K. Vaughan**, and D. Weindorf. 2019. Experiential learning in the Arctic. Soil Science Society of America. San Diego, CA. Oral and poster presentation.
7. Rabenhorst M.C., P. J. Drohan, J.M. Galbraith, L. Spokas, M. Stolt, J.A. Thompson, B.L. Vasilas, and **K.L. Vaughan**. 2019. Biogeochemistry of vernal pools assessed using IRIS film technology. Soil Science Society of America. San Diego, CA. Poster presentation.
8. Brevik, E. and **K. Vaughan**. 2019. Academic degrees earned by faculty teaching in American soil science programs; evaluation by sub-discipline. Soil Science Society of America. San Diego, CA. Poster presentation.
9. **Vaughan, K.** 2018. Soil evolution and mass flux of basaltic volcanics and cool, arid climate. University of Wyoming Geology Distinguished Lecture Series. *Invited*.
10. **Vaughan, K.** 2018. Wetland Biogeochemistry: where disciplines collide. Oregon State University, Benno P. Warkentin Guest Lecturer. May 2018. *Invited*.
11. **Vaughan, K.** 2018. If a tree falls in the forest and no one hears it, does it matter? The importance of communicating science. Oregon State University, Benno P. Warkentin Guest Lecturer. May 2018. *Invited*.
12. Duball, C., **K. Vaughan**, Berkowitz, A. Miller, and M. Vepraskas. 2018. Quantification of iron monosulfide expression in arid-land wetlands. Society of Wetland Scientists. Denver, CO. Poster presentation.
13. King, M. and **K. Vaughan**. 2018. Problematic calcareous soils in western Wyoming. Society of Wetland Scientists. Denver, CO. Poster presentation.
14. Duball C., **K. Vaughan**, A. Pennino, Y. Pressler, E. Brevik, C. Youngquist, S. Ying, P. Thompson, and L. Lynn. Reflections on the gender distribution and parity of U.S. soil scientists. IUSS World Congress of Soil Science. 2018. Rio, Brazil. Poster presentation.

15. **Vaughan K.** 2018. University of Wyoming Pedology Lab update. National Technical Committee for Hydric Soils Annual Meeting. Salt Lake City, UT. *Invited.*
16. **Vaughan K.** 2018. Graduate student → government soil scientist → faculty at a teaching university → faculty at a research university. Haub School Career Series. *Invited.*
17. Pennino A., **K. Vaughan.** 2018. A pedologic view of geomorphic reclamation in Wyoming. American Society of Mining and Reclamation. St. Louis, MO. Oral presentation.
18. Pennino A., K. Fleisher, K. Hufford, and **K. Vaughan.** 2018. Geomorphic Reclamation: A pioneer method on the frontier of the Wild West. American Society of Mining and Reclamation. St. Louis, MO. Poster presentation.
19. Brevik, E. and **K. Vaughan.** 2018. Academic Degrees Earned by Faculty Teaching in Soil Science Programs in the USA. European Geosciences Union General Assembly. Vienna, Austria. Poster presentation.
20. **Vaughan. K.L.** 2017. UWYO Pedology Lab update. Wyoming Cooperative Soil Survey Meeting. Cheyenne, WY. Oral presentation. *Invited.*
21. Berhe A.A., E. C. Brevik, T. Christopherson, C. Duball, D. S. Page-Dumroese, S. Kienast-Brown, D. L. Lindbo, L. A. Lynn, U. Norton, C. G. Olson, Y. Pressler, P. Thomas, **K. L. Vaughan**, S. Weems, S. C. Ying, C. Price Youngquist, A. Pennino, Z. Ash-Kropf, M. Tsiafouli, L. Winowiecki, and J. Chirtas. 2017. State of gender parity in soil science. Soil Science Society of America Annual Meeting. Tampa, FL. Combined oral and poster presentation accessed at www.uwyopedology.com/gender-parity-in-ss.html.
22. Pennino, A., **K.L. Vaughan**, and J. Norton. 2017. Soil development in response to geomorphic reclamation in the semi-arid west. Soil Science Society of America. Tampa, FL. Oral presentation.
23. Ash-Kropf, Z., L. Van Diepen, and **K.L. Vaughan.** 2017 Microbial dynamics in recently thawed high-alpine permafrost-affected soils. Soil Science Society of America. Tampa, FL. Poster presentation.
24. Kasten M., J.N. Norton, and **K.L. Vaughan.** 2017. Impact of grazing management on soil carbon storage and spatial area of wetlands along the national historic trails corridor, Wyoming. Soil Science Society of America. Tampa, FL. Poster presentation.
25. King, M. and **K. Vaughan.** 2017. Problematic calcareous soils in western Wyoming. Soil Science Society of America. Tampa, FL. Poster presentation.
26. **Vaughan K.** 2017. University of Wyoming update. National Technical Committee for Hydric Soils annual meeting. Duluth, MN. Oral presentation.
27. **Vaughan K.**, Z. Ash-Kropf, and L.T.A. van Diepen. 2017. Pedogenesis, permafrost, and C dynamics of alpine ecosystems in the Snowy Range Mountains, Wyoming. Ecological Society of America. Portland, OR. Poster presentation.
28. Regan M., J. Bruggink, C. Cole, E. Geisler, D. Kingsbury, P. Martyn, J. Rose, **K. Vaughan**, T. Rodgers, R. Almaraz. 2017. Initial Mapping Focus Team. National Cooperative Soil Survey Conference. Boise, ID. Poster presentation.
29. **Vaughan K.** 2017. Alpine permafrost in the Snowy Range...Are we too late? University of Wyoming Research Office Lightning Talks. Oral presentation.
30. Pennino, A., Fleisher, **K., Vaughan**, K., Hufford, K., Stahl, P. and Norton, J. 2017. Geomorphic reclamation and landscape heterogeneity: A preliminary look at landscape heterogeneity and

- vegetation establishment. American Society of Mining and Reclamation, Morgantown, WV. Poster presentation.
31. Brevik, E.C., **K. Vaughan**, S.J. Parikh, H. Dolliver, D. Lindbo, J.J. Steffan, D. Weindorf, P. McDaniel, M. Mbila, and S. Edinger-Marshall. 2017. Which Academic Majors Are Enrolling Students in American Soil Science Classes? Soil Science Society of America. Tampa, FL. Poster presentation.
 32. Pennino, A., **Vaughan, K.**, Hufford, K., Stahl, P. and Norton, J. 2017. Geomorphic reclamation and landscape heterogeneity: A preliminary look at landscape heterogeneity and vegetation establishment. Poster presentation at the annual Geoscience Communication Workshop, Castiglione del Lago, Umbria, Italy.
 33. **Vaughan, K.** 2017. Pedogenesis, permafrost, and C dynamics in the Snowy Range Mountains, Wyoming. Colorado State University Soil and Plant Science Seminar. Fort Collins, CO. Oral presentation. *Invited.*
 34. Pennino, A., **K. Vaughan**, and J. Norton. 2017. Geomorphic reclamation and landscape heterogeneity: A preliminary look at geomorphic stability and vegetation establishment. High-Altitude Revegetation and Central Rockies Society for Ecological Restoration(HAR-CeRSER) Conference, Fort Collins, CO. Poster presentation.
 35. Kasten, M., J. Norton, and **K. Vaughan**. 2017. Quantifying the impact of grazing management practices on soil carbon storage in hummock-affected wetlands. High Altitude Restoration Science and Practice Conference. Fort Collins, CO. Poster presentation.
 36. **Vaughan, K.**, F. Miller, N. Navarro, and C. Appel. 2017. Visual Assessment of sulfate reduction to identify wetland soils. Society of Wetland Scientists. San Juan, Puerto Rico. Oral presentation.
 37. Lindbo, D., E.C. Brevik, **K. Vaughan**, S.J. Parikh, H. Dolliver, J.J. Steffan, D. Weindorf, P. McDaniel, M. Mbila, and S. Edinger-Marshall. 2017. Trends in gender diversity in American soil science classes: 2004-2006 to 2013-2014 academic years. European Geosciences Union General Assembly. Vienna, Austria. Poster presentation.
 38. **Vaughan, K.**, R. Vaughan, J. Seeley, and E. Brevik. 2017. Experiential learning in soil science: Use of an augmented reality sandbox. European Geosciences Union General Assembly. Vienna, Austria. Poster presentation.
 39. Brevik, E.C., **K. Vaughan**, S.J. Parikh, H. Dolliver, D. Lindbo, J.J. Steffan, D. Weindorf, P. McDaniel, M. Mbila, and S. Edinger-Marshall. 2017. Enrollment trends in American soil science classes: 2004-2005 to 2013-2014 academic years. European Geosciences Union General Assembly. Vienna, Austria. Poster presentation.
 40. Brevik, E.C., **K. Vaughan**, S.J. Parikh, H. Dolliver, D. Lindbo, J.J. Steffan, D. Weindorf, P. McDaniel, M. Mbila, and S. Edinger-Marshall. 2017. The academic majors of students taking American soil science classes: 2004-2005 to 2013-2014 academic years. European Geosciences Union General Assembly. Vienna, Austria. Poster presentation.
 41. **Vaughan, K.**, R. Vaughan, and J. Seeley. 2016. Experiential learning in soil science: Use of an augmented reality sandbox. Soil Science Society of America. Phoenix, AZ. Combined oral and poster presentation.
 42. Vaughan, R., V. Archer, J. Skovlin, and **K. Vaughan**. 2016. Predication of volcanic ash distribution and depth in western Montana and eastern Idaho panhandle, USA. Soil Science Society of America. Phoenix, AZ. Poster presentation.

43. Pressler, Y., K. Osterloh, and **K. Vaughan**. 2016. Increasing undergraduate exposure to novel soil types through "virtual" soil judging regionals. Soil Science Society of America. Phoenix, AZ. Combined oral and poster presentation.
44. Verma, P., **K. Vaughan**, K. Martin, E. Pulitano, J. Garrett, and D.D. Piirto. 2016. Integrating Indigenous Knowledge & Western Science into Forestry, Natural Resource & Environmental Programs. Society of American Foresters. Madison, WI. Oral presentation.
45. **Vaughan, K.** 2016. University of Wyoming update. National Technical Committee for Hydric Soils annual meeting. Scottsbluff, NE. Oral presentation.
46. **Vaughan, K.** 2016. Visual assessment of sulfate reduction to identify hydric soils. Vaughan / van Diepen research group meeting. Fall 2016. Oral presentation.
47. **Vaughan, K.** 2016. Incorporating Experiential Learning in Soil Science Education: Use of an Augmented Reality Sandbox. Ellbogen Center for Teaching and Learning Summer Institute, University of Wyoming. Oral presentation, *invited*.
48. **Vaughan, K.**, R. Vaughan, J. Noller, T., *Cullum*, and M. *Taggart*. Quantification of outcomes generated using multi-scale geomorphic classification systems in predictive and update modes of digital soil mapping. Soil Science Society of America. Minneapolis, MN. 2015. Poster presentation.
49. **Vaughan, K.**, F. *Miller*, N. *Navarro*, and C. *Appel*. Development and documentation of a standard for visual sulfur reduction to identify seasonally inundated wetlands. Soil Science Society of America. Minneapolis, MN. 2015. Poster presentation.
50. Verma, P., **K. Vaughan**, K. Martin, E. Pulitano, J. Garrett, and D.D. Piirto. Integrating indigenous knowledge and western science into forestry, natural resources, and environmental programs. Association for Environmental Studies and Science. San Diego, CA. 2015. Oral Presentation
51. **Vaughan, K.** Hydric soil update for California and Wyoming. National Technical Committee for Hydric Soils Annual Meeting. Fairbanks, AK. 2015. Oral Presentation.
52. Noller, J., **Vaughan, K.**, Vaughan, R., and C. Ringo. Multi-Scale Geomorphic Classifications - In predictive and update digital soil mapping. Western Regional National Cooperative Soil Survey Meeting. Portland, OR. 2014. Oral Presentation.
53. Namm, A. and **K. Vaughan**. Serpentinic problematic hydric soil in a Mediterranean climate along the central coast of California. Soil Science Society of America. Tampa, FL. 2013. Poster presentation.
54. Pressler, Y. and **K. Vaughan**. Nitrogen cycling in well-developed cyanobacterial biological soil crusts under varied moisture conditions. Soil Science Society of America. Tampa, FL. 2013. Poster presentation.
55. **Vaughan, K.** Use of soil climatic data to improve agricultural productivity and water supply forecasts. CAFES Graduate Seminar. California Polytechnic State University. San Luis Obispo, CA. 2011. Oral presentation, *invited*.
56. Julander, R., **K. Vaughan**, M. Bricco, B. Uriona, T. Bardsley, and B. Nault. 2011. The Mill Flat Fire hydrologic and flood potential evaluation. Western Snow Conference. South Lake Tahoe, CA. 2011. Oral Presentation.
57. **Vaughan, K.** and R. Julander. What does soil moisture tell us about the behavior of snowpack? Western Snow Conference. South Lake Tahoe, CA. 2011. Poster Presentation.

58. Bronsten, T., R. Julander, R. Vaughan, **K. Vaughan**, and M. Bricco. The use of UAVs in mapping vegetation at snow sites. Western Snow Conference. South Lake Tahoe, CA. 2011. Poster Presentation.
59. **Vaughan, K.** Soil Climate Analysis Network and Snow Survey Program. Utah Soil Scientists Workshop. St. George, UT. 2011. Oral Presentation, *invited*.
60. **Vaughan, K.**, M. Domeier, and R. Julander. Soil Climate Analysis Network: Importance of monitoring the influence of climatic conditions on soil. Soil Science Society of America. Long Beach, CA. 2010. Poster presentation.
61. **Vaughan, K.** Soil moisture and temperature data collected at SNOTEL sites in the western United States. National Oceanic and Atmospheric Administration and National Weather Service. Salt Lake City, UT. 2010. Oral presentation, *invited*.
62. **Vaughan, K.**, M. Domeier, and R. Julander. Relationship between climatic conditions and soil properties at SCAN and SNOTEL sites in Utah. Western Soil Science Society Annual Meeting. Las Vegas, NV. 2010. Poster presentation.
63. Strachen, S. and **Vaughan, K.L.** Soil moisture and temperature measured at SNOTEL and SCAN sites. ID, OR, and WA Tri-State Soil Scientists Training Session. Moscow, ID. 2010. Oral Presentation.
64. Abramovich, R., Perkins, T., Julander, R, and **Vaughan, K.** Products, tools, and resources for water management. Western Snow Conference. Logan, UT. 2010. Oral presentation.
65. **Vaughan, K.** and R. Julander. Relationship between climatic conditions and soil properties at SCAN and SNOTEL sites in Utah. Western Snow Conference. Logan, UT. 2010. Poster presentation.
66. Baker, L.L, D.G. Strawn, **K.L. Vaughan**, and P.A. McDaniel. XAFS study of Fe mineralogy of soil colloids formed in basaltic tephra under cold, dry conditions. Soil Science Society of America. 2009. Pittsburg, PA. Poster presentation.
67. **Vaughan, K.**, K. Sutcliffe, R. Julander, and M. Domeier. Utah Soil Climate Analysis Network. National Cooperative Soil Survey Conference. Las Cruces, NM. 2009. Poster presentation.
68. **Vaughan, K.** Utah Soil Climate Analysis Network – data usage and product availability. Utah Water Users Workshop. 2009. St. George, UT. Poster presentation.
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