

Susan Hubbard, PhD

Curriculum Vitae

Associate Laboratory Director & Sr. Scientist

Lawrence Berkeley National Laboratory

Full Professor Adjunct, UC Berkeley

<http://eesa.lbl.gov/profiles/susan-hubbard/>

Associate Laboratory Director, Berkeley National Laboratory. Leads a premier [Earth and Environmental Science organization](#) focused on advancing insights and integrative solutions for pressing challenges of our time, including climate change and adaptation, water resources and ecosystem resiliency, and Earth solutions for sustainable energy, carbon management and storage, and critical minerals.

Senior Earth Scientist. Research focuses on quantifying terrestrial processes that govern water availability, water quality, carbon cycling, and agriculture through advancing [geophysical](#) methods and data fusion approaches. Recognized for contributing to the development of the field of hydrogeophysics. Member of the National Academy of Engineering, and elected Fellow of the American Academy of Arts and Sciences, the American Geophysical Union, and the Geological Society of America. Extensive service record for the scientific community, the Department of Energy and California.

Committed to fostering a diverse and inclusive culture, and to the proactive development of early-career scientists and organizational health.

Professional Positions

2015-present, Associate Berkeley Laboratory Director, Earth and Environmental Sciences Area

2015-present, UC Berkeley, Environmental Science, Policy and Mgmt., Full Professor Adjunct

2010-2015, Director, Deputy Director Earth Sciences Division, Berkeley Lab

2007-2010, Founding Associate Director, UC Berkeley Water Center

1998-present, Earth Scientist, Berkeley Lab

1990-1993, Geophysicist, ARCO Oil and Gas Co.

1985-1987, Geologist, U.S. Geological Survey, Menlo Park CA

Education

Ph.D., Civil and Environmental Engineering, Hydrogeology focus, UC Berkeley, 1998.

M.S., Geophysics, Virginia Tech.

B.S., Geology, University of California, Santa Barbara.

Awards and Recognitions (Select):

2021, Society of Geophysicists 2022 Global Lecturer, Near Surface Geophysics
2020, Elected Member, National Academy of Engineering
2019, Elected Fellow, American Academy of Arts and Sciences
2019, American Institute of Hydrology Robert G. Wetzel Award on Water Quality
2019, Distinguished Alumni, UC Santa Barbara Earth Sciences Department
2019, Alameda County CA Women's Hall of Fame, Science Award
2017, Elected Fellow, American Geophysical Union
2016, Hal Mooney Award, Society of Exploration Geophysicists
2014, Distinguished Alumni, Civil and Environmental Engineering Academy, UC Berkeley
2014, Soc. for Technical Communication, Distinguished Technical Communication Award
2013, Outstanding Women @ Berkeley Lab recognition
2011, Elected Fellow, Geological Society of America
2010, Birdsall-Dreiss Distinguished Lecturer, Geological Society of America
2009, Top Associate Editor Award, Journal of Hydrology
2009, Frank Frischknecht Leadership Award, Society of Exploration Geophysicists
2008, Most influential article, SEG Leading Edge

Professional Service (Select):

Advisory / Board Roles

2021-present, Member, Special Nominating Committee, Section 11, National Academy of Engineering
2021-present, Board of Directors, California Council of Science and Technology (CCST)
2021-present, Board of the Distinguished Alumni Academy, UC Berkeley C&E Engineering
2020-present, Chair, Governance Board, National Alliance for Water Innovation (NAWI Hub)
2000-present, Member, Council of Energy, Climate and Environmental Deans, UC Berkeley
2020, Review Committee, Manaaki Whenua Landcare, New Zealand Natl. Lab
2019, Review Committee, Virginia Tech Geosciences
2017-present, Advisory Board, International Soil Modeling Consortium
2017-present, Advisory Board, EPA Superfund Program 'Exposome' UCB
2017-2019, Partnership Board, DOE-BER Environmental System Science Cyberinfrastructure
2016-2019, Scientific Advisory Board, NSF Arctic Data Center UCSB
2016-2019, Advisory Board, Civil and Environmental Engineering Dept, UC Berkeley
2015-2020, Council member, California Council on Science and Technology (CCST)
2015-2019, Director's Council, University of California Water Science
2015-2018, Advisory Board, Interoperable design extreme scale software (IDEAS; DOE-BER)
2014-2018, Advisory Board, Radionuclide Waste Disposal, EPSCoR Program, South Carolina
2014-2017, Sr Advisor, DOE Advanced Simulation Capability for Env. Mgmt (ASCEM, DOE-EM)
2013, Helmholtz Association Terrestrial Program External Review Committee, Germany
2012, Stanford Dept of Energy Resources Engineering External Review Committee
2011, Advisory Board, SmartGeo NSF IGERT, Colorado School of Mines
2010-2015, DOE-BER Federal Advisory Committee (BERAC)
2010, DOE-EM Technical Advisory Committee

2006, Forschungszentrum Jülich National Laboratory Advisory Committee, Germany

Editorial Boards:

2010-2015, Associate Editor JGR-Biosciences
2007-2013, Co-Editor Vadose Zone Journal
2007-2010, Associate Editor, Journal of Hydrology
2001-2005, Associate Editor Water Res. Research

Select Community and DOE Service Roles:

2021, University of California Wildfire Symposium Moderator, CA Agency Engagement
2021, Chair, AAAS Atmospheric and Hydrospheric Section
2020, Chair-Elect, AAAS Atmospheric and Hydrospheric Section
2020-present, National Academy of Engineering Search Committee, Section 11
2020-present, Program Committee, California Council of Science and Technology (CCST)
2020-2021, DOE LOB Working Group: Examining Opportunities for Improvements and Flexibilities
Enhance Recruitment and Retention
2020 Reviewer of select DOE Lab Diversity Program and Plan
2020-present, Canvassing Committee, American Geophysical Union
2019-present, Nominations Committee, American Geophysical Union
2019-present, Senior Leader, International Early Career Critical Zone Science Consortium
2019-2020, Steering Committee, Interagency Conference on Research in Watersheds (ICRW)
2018- 2020, Macelwane Award Committee, American Geophysical Union
2018- 2020, Nominations Committee, Geological Society of America
2018-2019, California AB1281 Produced Water Executive Committee, CCST
2018, Executive Committee, California Water-Data AB1755 Governance & Funding
2017, Fall meeting session co-chair, American Geophysical Union
2018, Organizer, Collaborative Watershed Science Workshop, Crested Butte CO
2017, Organizer, Open and Transparent California Water Data Capstone Workshop, Berkeley,
2017, Writer, DOE-BER Grand Challenges in Biological and Environmental Sci. Chapter Report
2017, Co-Organizer, Environmental Knowledgebase Workshop, BIDS, Berkeley
2016, Co-Chair, DOE-BES Basic Research Needs Workshop Water-Energy, Wash DC
2015, Panel Lead and Writer, DOE-BES Basic Research Needs for Environmental Mgmt.
2015, Technical lead for DOE Subsurface Science, National Laboratory Engagement Day,
Washington DC
2015, Committee member and Writer, UC-DOE Basic Research Needs for Water-Energy
2014-2016 UC Global Food Initiative, Berkeley Lab Representative
2014-2018, Co-lead, National Subsurface DOE 'crosscut' Initiative; Cross DOE strategy to transform
the adaptive control of the subsurface for environmentally responsible energy production
and waste storage
2014, Session Chair, Subsurface fracture control, Rock and Fluid Physics Conference,
Shell Technology Center, Amsterdam, 2014
2014, Conference Co-Chair, Complex Soil Systems SSSA/Bouyoucos Conference, Berkeley
2013, Birdsall Dreiss Search Committee Chair
2012, Session Chair, Geophysical Characterization of Permafrost Systems, Fall AGU, San Francisco

2012, Contributor/writer, DOE-BER Technology Innovation ‘Virtual Laboratory’ Report (DOE/SC-0156)

2010, Contributor/writer DOE-BER “Grand Challenges for Biological and Environmental Research: A Long-Term Vision” (DOE/SC-1035, 2010)

2010, Co-lead and co- author DOE-BER “Complex System Science for Subsurface Fate and Transport” (DOE/SC0123, 2010) and workshop

2010, Writer, DOE-EM Long-Range Deep Vadose Zone Program Plan (DOE/RL-2010-89)

2010, Session chair, Computational Methods in Water Res., Barcelona, June 2010,

2010, Session Chair, Goldschmidt conference, Session Chair Knoxville, TN, June 2010.

2010, Co-author, DOE-EM Scientific Opportunities to Reduce Risk in Groundwater and Soil Remediation (PNNL-18516).

2008, Co-organizer, Computational Methods in Water Resources Conference, San Francisco

2008, Co-organizer, Chapman Conference, Biogeophysics, Portland Maine

2006, Contributor, DOE-BES Basic Research Needs for Geosciences: Facilitating 21st Century Energy Needs

2002-2006, Chair, AGU Hydrogeophysics Technical Committee

2002, Founder, AGU Hydrogeophysics Technical Committee

2002-2006, US representative, International Ass. Hydrological Sci. “2020 “Working Group

2004, Panelist, DOE-BES workshop noninvasive Earth monitoring, Houston Tx

2005, Panelist, DOE EM Geop. Characterization and monitoring workshop.

2005, Chair, Watershed Characterization Special Session, Fall AGU, San Fran.

2004, Chair, Hydrogeophysics Special Session, Fall AGU, San Francisco.

2003, Chair, Hydrogeophysics Special Session, Fall AGU, San Francisco

2003, Organizer, Coupled Processes DOE-BER Workshop, Berkeley CA, LBNL

2003, Chair, Coupled Processes DOE-BER Subsurface Science Session, DOE EMSP, WA

2002, Co-Organizer, NATO Hydrogeophysics Advanced Study Inst., Czech Republic

2000, Chair, Breakthroughs in Field Scale Bacterial Transport, Fall AGU, S.F.

Example Large Initiative and Team Project Leadership

2020-present Carbon Negative Labwide Initiative, Senior Advisor

2019-present [NAWI](#) (National Alliance for Water Innovation) Hub. Senior Advisor and Chair of Governance Board

2015-present [Water-Energy Resilience](#) Initiative Berkeley Lab, Founding Labwide Lead, currently Co-Sr. Advisor

2014-2017 DOE [SubTER](#) (Subsurface Technology and Engineering Research, Development and Demonstration) National Crosscut, co-chair

2013-present [Microbes to Biomes \(M2B\)](#) Initiative, Berkeley Lab, Senior Advisor

2007-present [Watershed Function](#) Scientific Focus Area, PI

2007-2010 [Berkeley Water Center](#). Founding Associate Director

Invited Speaking Engagements (Select)

2021, Panelist, BER Mountainous Hydroclimate Workshop
2021, Plenary speaker, DOE-BER ESS PI Meeting
2021, CUASHI Critical Zone - Watershed Seminar Series
2021, Moderator with California Agency Leaders, UC Wildfire Virtual Symposium
2021, University of California, Davis
2021, University of Washington, St. Louis
2021, University of Idaho and Washington State
2020, American Geophysical Union
2020, Interagency Conference on Research in Watersheds
2020, AAAS Panel Moderator, Wildfire Resilience through Science and Technology
2019, Commencement Speech, Virginia Tech, Geoscience Department
2019, American Geophysical Union Fall Meeting, San Francisco
2019, Stanford University, Geophysics Dept Seminar
2019, CA Contemporary Groundwater Issues Council Panelist, UC Davis
2019, Moderator, Wildfire Panel for CA Legislators, CCST, Sacto CA
2019, University of Wyoming, Laramie, WY
2019, Soil Science Society of America, San Diego, CA
2018, American Geophysical Union Fall Meeting, San Francisco, CA
2018, Tsinghua University, China
2018, Peking University, China
2018, Chinese Academy of Sciences, Tibetan Research Inst Beijing, China
2018, Chinese Academy of Sciences, Env. and Ecosys. Science, Beijing Normal University, China
2017, CA Department of Water Resources, Sacto CA
2017, American Chemical Society, California Water Resiliency, Washington DC
2017, American Geophysical Society Union Fall Meeting, Session H32D, New Orleans, LA
2017, American Geophysical Society Union Fall Meeting, Session H31J, New Orleans, LA
2017, Urbana Champaign Illinois University, Distinguished seminar, Urbana Champaign, Ill
2018, OZCAR France Critical Zone meeting, Frejus, France
2018, Colorado School of Mines Heiland Distinguished Speaker, Golden CA
2018, National Academies Review, Washington DC
2017, UC Berkeley Civil and Environmental Engineering Seminar, Berkeley CA
2017, 27th Annual Intern. Conf. on Soil, Water, Energy, & Air, San Diego, CA
2017, University of Southern California Distinguished Seminar, Los Angeles, CA
2016, American Geophysical Union Fall Meeting, San Francisco
2016, France National Polytechnical Institute, Bordeaux, Distinguished Seminar
2016, University of Saskatchewan Saskatoon Distinguished Lecturer series, Saskatoon, Canada
2016, UC Merced Distinguished Seminar, Merced CA
2016, CUAHSI Big Data Workshop, Shepherdstown, WV
2016, Geotech/Geoengineering Distinguished Lecture, UC Berkeley, CA
2016, KOPRI Polar Science Symposium, Plenary Speaker, Seoul Korea
2016, Waterloo Distinguished 'Watertalks' Lecture Series, Waterloo, Ontario, Canada
2015, Water Resource Sustainability Issues on Tropical Islands Conference, Hawaii

2015, American Geophysical Union Fall Meeting, B52C-04, San Francisco, CA
2015, American Geophysical Union Fall Meeting, Union Session Invited San Francisco, CA
2015, European Geophysical Union Invited Speaker, Vienna Austria
2014, CUAHSI Big Data Bi-Annual Conference, Shepherdstown, WV
2014, University of Wyoming Geology and Geop. Distinguished Lecturer Series, Laramie, WY
2014, Complex Soils Systems 2014 Conference, Berkeley, CA
2014, Jason Group, 'State of Stress in the Engineered Subsurface', Los Angeles, CA
2014, US Energy Association, Research needs in Subsurface Energy Science, Arlington, VA
2014, Shell Subsurface Complexity Workshop, Amsterdam, Netherlands
2014, Env. Science and Policy Mgmt UCB Berkeley Seminar Series, Berkeley CA
2014, DOE Subsurface Biogeochemistry and Terrestrial Ecosystems PI Meeting, Maryland
2013, American Geophysical Union Fall Meeting, San Francisco, CA
2013, Energy Biosciences Institute Seminar Series, Berkeley, CA
2013, Keynote Presentation, Washington Hydrology Symposium, Tacoma, WA
2013, Stanford Environmental Fluid Mechanics and Hydrology Colloquium
2012, American Geophysical Union H53F-1586 AGU, San Francisco, CA
2012, American Geophysical Union, H33N-01 Fall Meeting, AGU, San Francisco, CA,
2012, Water Research Horizon Conference, Berlin, Germany
2012, European Geophysical Union Vienna, Austria
2012, Battelle Chlorinated Conference Keynote, Monterey CA
2011 Dept of Energy Biological and Env Advisory Committee, Washington DC
2011, New Frontiers in Engineering Science for Sustainability, Texas A&M Water Scholar Seminar
2011, University of Nevada, Seminar Speaker, Las Vegas Nevada
2011, Duke University Distinguished Seminar, North Carolina
2011, Advanced Dept of Energy Simulation Capability Workshop, Washington, DC
2011, Rensselaer University Invited Seminar, NY
2011, NSF Water Scholar Seminar Series Keynote, Texas A&M, College Station TX
2010, University of Wisconsin, Madison Invited Seminar, Wisconsin
2010, Argonne National Laboratory Distinguished Speaker, Illinois
2010, Northern Illinois University, Dekalb, Distinguished Seminar, Illinois
2010, Michigan State, East Lansing Michigan
2010, Grand Valley University, Michigan
2010, Groundwater Research Association Distinguished Speaker, Sacramento, CA
2010, Inland Geological Society Invited Speaker, Riverside, CA
2010, Computational Methods in Water Resources Keynote, Barcelona Spain
2010, UC Davis Hydrological Seminar Series, Davis CA
2010, National Groundwater Summit Keynote, Denver, CO
2010, UC Berkeley Civil and Environmental Eng. Seminar Series, Berkeley CA
2010, Dept of Energy Env Remediation Science Program Platform Presentation, Washington, DC,
2010, Distinguished Environmental Lecture, Florida International University, Miami FLA
2010, University of Florida Spring Seminar Series, Gainesville, FLA
2010, Delaware Environmental Institute Distinguished Lecture
2010, UMass Environmental Lecture Series, Amherst, Massachusetts
2010, K. Douglas Nelson Lecture Series, Syracuse University, New York

2009, Semi-Annual Dawdy Invited Lecture, Department of Geos., San Francisco State University
2010, Oregon State University Geoscience Seminar Series
2010, Portland Environmental Geology Seminar Series, Oregon
2009, New Mexico Tech Hydrology Seminar, Socorro, NM
2009, Frontiers in Geosciences' Distinguished Colloquium, Los Alamos Natl Laboratory
2009, American Geophysical Union Fall Meeting, San Francisco
2009, American Geophysical Union Spring Meeting, Toronto, Canada
2009, Association for Env. Health and Sciences Invited platform speaker, San Diego
2008, Stanford Environmental and Fluid Mechanics Invited Seminar
2008, U.S.G.S. Water Research Division Seminar Series, Menlo Park, CA
2008, Gordon Conference Flow in Porous Media, Oxford England
2007, NRC Workshop on Uncertainty, sensitivity and parameter estimation Wash DC
2007, American Geophysical Union Fall Meeting, San Francisco, CA
2007, UC Davis Engineering Seminar Series, Davis CA
2006 American Geophysical Union, Fall Meeting San Francisco, CA
2006 Geological Society of America, Philadelphia, PA
2006, Groundwater Resources of California, Long Beach, CA
2006, Oregon State University 'World-Class Women in Water' seminar series, Corvallis, OR
2006, Seismological Laboratory Seminar Series, Berkeley CA
2006, Computational Methods in Water Resources (CMWRC), Platform Speaker, Copenhagen
2005, IWAGPR Conference Keynote, Delft, Netherlands
2004, UC Merced Environmental Seminar Series, Merced CA
2004, Univ of Texas at Austin, Austin, TX
2004, Waste Management Conference Keynote, Tuscon AZ
2005, American Geophysical Union Frontier Lecture, Spring Meeting Montreal, Canada
2004, Dept of Energy Characterization and Monitoring Workshop Keynote, Salt Lake City
2004, Univ of Buffalo, UB Geology Pegrem Speaker Series, New York
2004, University of Kansas at Lawrence, Seminar Speaker, Lawrence Kansas
2004, USGS Water Resources Seminar, Menlo Park, CA
2003, Heiland Distinguished Lecturer, Colorado School of Mines, Golden, CO
2003, Vadose zone characterization Series, University of Arizona, Tuscon, AZ
2003, NRC-180 Precision Agriculture Conference, UC Davis, CA
2002, American Geophysical Union Spring Meeting Washington DC
2001, Geological Society of America Annual Meeting, Boston, MA
2001, UC Berkeley Environmental Engineering Series, Berkeley CA
2001, American Geophysical Union Fall Meeting, San Francisco
2001, Kovacs Colloquium Speaker: Groundwater Resources at Risk, IAHS, Paris, France
2001, American Geophysical Union Spring Meeting, Washington, DC
2000, Boise State Geology Seminar Series, Boise, ID
2000, UC Davis Hydrology Seminar Series, Davis, CA

Memberships

National Academy of Engineering
American Geophysical Union
American Academy of Arts and Sciences
Geological Society of American
Society of Exploration Geophysicists
American Association for the Advancement of Science
American Association for Women in Science
Soil Science Society of America

Publications

Researcher ID E-9508-2010; Metrics and publications available [HERE](#)

In Review

1. Carroll, R. W. H., Deems, J. S., Maxwell, R. M., Sprenger, M., Brown, W. S., Newman, A., Beutler, C., Bill, M., Hubbard, S. S., & Williams, K. H. (2021). Stable water isotope inputs across Mountain Landscapes. <https://doi.org/10.1002/essoar.10507500.1>
2. Dafflon, B., Wielandt, S., Lamb, J., McClure, P., Shirley, I., Uhlemann, S., Wang, C., Fiolleau, S., Brunetti, C., Akins, F. H., Fitzpatrick, J., Pullman, S., Busey, R., Ulrich, C., Peterson, J., & Hubbard, S. S. (2021). A distributed temperature profiling system for vertically and laterally dense acquisition of soil and snow temperature. <https://doi.org/10.5194/tc-2021-292>
3. Dwivedi, D., Steefel, C., Arora, B., Banfield, J., Bargar, J., Boyanov, M.I, Brooks, S.C., Chen, X., Hubbard, S., Kaplan, D., Kemner, K.M., O'Loughlin, E.J., Pierce, E.M., Painter, S.L., Scheibe, T., Wainwright, H., Williams, K.H., Zavarin, M., (2021), From Legacy Contamination to Watershed Systems Science: A Review of Scientific Insights and Technologies Developed through DOE-Supported Research in Water and Energy Security", Environmental Research Letters
4. Uhlemann, S., Dafflon, B., Wainwright, H.W., Williams, K.H., Minsley, B.J., Zamudio, K.D., Carr, B., Falco, N., Ulrich, C., Hubbard, S.S., Surface parameters and bedrock properties co-vary across a mountainous watershed: Insights from Machine Learning and Airborne EM, Science Advances
5. Wainwright, H. M., Uhlemann, S., Franklin, M., Falco, N., Bouskill, N. J., Newcomer, M., Dafflon, B., Woodburn, E., Minsley, B. J., Williams, K. H., and Hubbard, S. S.: Watershed zonation approach for tractably quantifying above-and-belowground watershed heterogeneity and functions, Hydrol. Earth Syst. Sci. Discuss. [preprint], <https://doi.org/10.5194/hess-2021-228>.

Published

1. Cantor, A., Kiparsky, M., Hubbard, S. S., Kennedy, R., Pecharroman, L. C., Guivetchi, K., Darling, G., McCready, C., & Bales, R. (2021). Making a water data system responsive to information needs of decision makers. *Frontiers in Climate*, 3. <https://doi.org/10.3389/fclim.2021.761444>
2. Varadharajan, C., V.C. Hendrix, D.S. Christianson, M. Burrus, C. Wong, S.S. Hubbard, D.A. Agarwal, (2021), BASIN-3D: A brokering framework to integrate diverse environmental data, *Computers and Geosciences*, 2021,105024, ISSN 0098-3004, doi: 10.1016/j.cageo.2021.105024
3. Dafflon, B., Uhlemann, S., Hubbard, S.S., (2021) Permafrost-Through-Canopy Investigation of Thermal and Ecohydrological Processes in Arctic Systems, *Technical Articles*, Vol. 26. 3 *Climate Change and Critical Zone Geophysics*, EEGS Fast Times Online

4. Yan, Q., Wainwright, H., Dafflon, B., Uhlemann, S., Steefel, C. I., Falco, N., Kwang, J., & Hubbard, S. S. (2021). A hybrid data–model approach to map soil thickness in mountain hillslopes. *Earth Surface Dynamics*, 9(5), 1347–1361. <https://doi.org/10.5194/esurf-9-1347-2021>
5. Chen, J., Dafflon, B., Tran, A. P., Falco, N., & Hubbard, S. S. (2021). A deep learning hybrid predictive modeling (HPM) approach for estimating evapotranspiration and ecosystem respiration. *Hydrology and Earth System Sciences*, 25(11), 6041–6066. doi: 10.5194/hess-25-6041-2021
6. Dwivedi, D., Mital, U., Faybishenko, B., Dafflon, B., Varadharajan, C., Agarwal, D., Williams, K. H., Steefel, C., & Hubbard, S. (2021). Imputation of contiguous gaps and extremes of subhourly groundwater time series using random forests. *Journal of Machine Learning for Modeling and Computing*. <https://doi.org/10.1615/jmachlearnmodelcomput.2021038774>
7. Revil, A., Schmutz, M., Abdulsamad, F., Balde, A., Beck, C., Ghorbani, A., & Hubbard, S. S. (2021). Field-scale estimation of soil properties from spectral induced polarization tomography. *Geoderma*, 403, 115380. doi: 10.1016/j.geoderma.2021.115380
8. Wan, J., Tokunaga, T. K., Brown, W., Newman, A. W., Dong, W., Bill, M., Beutler, C. A., Henderson, A. N., Harvey-Costello, N., Conrad, M. E., Bouskill, N. J., Hubbard, S. S., & Williams, K. H. (2021). Bedrock weathering contributes to subsurface reactive nitrogen and nitrous oxide emissions. *Nature Geoscience*, 14(4), 217–224. doi: 10.1038/s41561-021-00717-0
9. Matheus Carnevali, P.B. et al (2021). Meanders as a scaling motif for understanding of floodplain soil microbiome and biogeochemical potential at the watershed scale. *Microbiome*, 9(1). doi: 10.1186/s40168-020-00957-z
10. Wainwright, H. et al. (2021), High-resolution Spatiotemporal Estimation of Net Ecosystem Exchange in Ice-Wedge Polygon Tundra Using In Situ Sensors and Remote Sensing Data, *Land*, <https://doi.org/10.3390/land10070722>
11. Hubbard, S.S., Schmutz, M., Balde, A. et al. (2021) Estimation of soil classes and their relationship to grapevine vigor in a Bordeaux vineyard: advancing the practical joint use of electromagnetic induction (EMI) and NDVI datasets for precision viticulture. *Precision Agric.* doi: 10.1007/s11119-021-09788-w
12. Rogers, D.B., Newcomer, M.E., Raberg, J.H., Dwivedi, D., Steefel, C., Bouskill, N., Nico, P., Faybishenko, B., Fox, P., Conrad, M., Bill, M., Brodie, E., Arora, B., Dafflon, B., Williams, K.H. and Hubbard, S.S. (2021) Modeling the Impact of Riparian Hollows on River Corridor Nitrogen Exports. *Front. Water* 3:590314. doi: 10.3389/frwa.2021.590314
13. Kakalia, Z., Varadharajan, C., Alper, E., Brodie, E. L., Burrus, M., Carroll, R. W. H., Christianson, D. S., Dong, W., Hendrix, V. C., Henderson, M., Hubbard, S. S., Johnson, D., Versteeg, R., Williams, K. H., & Agarwal, D. A. (2021). The Colorado East River Community Observatory Data Collection. *Hydrological Processes*, 35(6), e14243. doi: 10.1002/hyp.14243
14. Falco, N., Wainwright, H. M., Dafflon, B., Ulrich, C., Soom, F., Peterson, J. E., Brown, J. B., Schaettle, K. B., Williamson, M., Cothren, J. D., Ham, R. G., McEntire, J. A., & Hubbard, S. S. (2021). Influence of soil heterogeneity on soybean plant development and crop yield evaluated using time-series of UAV and ground-based geophysical imagery. *Scientific Reports*, 11(1). doi: 10.1038/s41598-021-86480-z
15. Uhlemann, S., Dafflon, B., Peterson, J., Ulrich, C., Shirley, I., Michail, S., & Hubbard, S. S. (2021). Geophysical Monitoring Shows that Spatial Heterogeneity in Thermohydrological Dynamics Reshapes a Transitional Permafrost System. *Geophysical Research Letters*, 48, e2020GL091149. <https://doi.org/10.1029/2020GL091149>

16. Newcomer, M. E., Bouskill, N. J., Wainwright, H., Maavara, T., Arora, B., Siirila-Woodburn, E. R., Dwivedi, D., Williams, K. H., Steefel, C., & Hubbard, S. S. (2021). Hysteresis Patterns of Watershed Nitrogen Retention and Loss Over the Past 50 years in United States Hydrological Basins. *Global Biogeochemical Cycles*, 35(4). doi: 10.1029/2020gb006777
17. Hubbard, S.S., et al., (2020), Emerging technologies and radical collaboration to advance predictive understanding of watershed hydro-biogeochemistry, *Hydrological Processes*, 1-8. <https://doi.org/10.1002/hyp.13807>
18. Peruzzo, L. et al., Imaging of Plant Current Pathways for Non-invasive Root Phenotyping using a newly developed Electrical Current Source Density Approach (2020), *Plant and Soil*, <https://doi.org/10.1007/s11104-020-04529-w>
19. Mary, B., Peruzzo, L., Boaga, J., Cenni, N., Schmutz, M., Wu, Y., Hubbard, S.S., and Cassiani, G., (2020), Time-lapse monitoring of root water uptake using electrical resistivity tomography and mise-à-la-masse: a vineyard infiltration experiment,, *Soil*, v. 6, p. 95–114, doi: 10.5194/soil-6-95-2020.
20. Wainwright, H.M., C. Steefel, S. Trutner, A. Henderson, E. Nikolopoulos, K. Chadwick, Katherine; N. Falco, C. Wilmer, H. Steltzer, K. Williams, S. Hubbard, K. Schaettle, J. Brown, B. Enquist, (2020), Satellite-derived Foresummer Drought Sensitivity of Plant Productivity in Rocky Mountain Headwater Catchments: Spatial Heterogeneity and Geological-Geomorphological Control, *Env. Research Letters*, 15, 084018
21. Sorensen, P.O et al., The Snowmelt Nice Differentiates Three Microbial Life Strategies that Influence Soil Nitrogen Availability During and After Winter (2020), *Frontiers in Microbiology*, doi: 10.3389/fmicb.2020.00871
22. Arora, B. et al., (2020), Differential C-Q Analysis: A new approach to inferring lateral transport and hydrologic transients within multiple reaches of a mountainous headwater catchment, *Frontiers in Water*, <https://doi.org/10.3389/frwa.2020.00024>
23. Wan, J., Tokunaga, T.K., Williams, K.H., Dong, W., Brown, W., Henderson, A.N., Newman, A.W., and Hubbard, S.S. (2019), Predicting sedimentary bedrock subsurface weathering fronts and weathering rates: *Scientific Reports*, v. 9, doi: 10.1038/s41598-019-53205-2.
24. Varadharajan, C. et al., (2019) Challenges in Building an End-to-End System for Acquisition, Management, and Integration of Diverse Data from Sensor Networks in Watersheds: Lessons from a Mountainous Community Observatory in East River, Colorado, *IEEE Access*, *IEEE Access*, vol. 7, pp. 182796-182813,
25. Arora, B., Wainwright, H.M., Dwivedi, D., Vaughn, L.J., Curtis, J.B., Torn, M.S., Dafflon, B., and Hubbard, S.S. (2019) Evaluating temporal controls on greenhouse gas (GHG) fluxes in an Arctic tundra environment: An entropy-based approach: *Science of The Total Environment*, v. 649, p. 284–299, doi: 10.1016/j.scitotenv.2018.08.251.
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