

Susan S. Hubbard

Associate Laboratory Director, Earth and Environmental Sciences

Senior Scientist

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Professional Positions:

- Associate Laboratory Director, Earth and Environmental Sciences. Staff of ~450. Premier Energy Geoscience and Climate & Ecosystems Science Divisions with significant research portfolios in climate science, terrestrial ecosystem science, environmental and biological system science, fundamental geoscience, and subsurface energy resources, including carbon sequestration, geothermal, nuclear and fossil energy strategies.
- Director, Earth Sciences Division, Berkeley Lab, 2013-2015.
- Deputy Director for Programs, Earth Sciences Division, Berkeley Lab, 2010-2013. With Division Director, responsible for Division strategy and research, with particular focus on environmental, biological, carbon and climate programs.
- Senior Geological Scientist, Berkeley Lab, 2010-present. Lead or co-lead of several large, multi-disciplinary, multi-institutional team projects, including PI of the DOE 'genomes-to-watershed' subsurface scientific focus area (SFA) and co-PI of the DOE's Next Generation Ecosystem Experiment-Arctic (NGEE-Arctic) project
- Associate Director, Berkeley Water Center, UC Berkeley, 2007-present.
- Program Lead, Environmental Remediation and Water Resources Program, 2004-2010.
- Group Lead, Environmental Geophysics, Berkeley Lab, 2003-present.
- Staff Geological Scientist, Berkeley Lab, 2002-2010. Substantially contributed the development of fields now known as hydrogeophysics and biogeophysics. Applied developed methods to improve understanding of complex subsurface functioning relevant to environmental remediation, water resources, agriculture and ecosystems
- Geological Scientist, Berkeley Lab, 1998-2002.
- Geophysicist, ARCO Oil and Gas Co., 1990-1993. With the advent of horizontal drilling, developed new ways to use geophysical methods to explore for hydrocarbons in fractured formations. Interpretations and drilling recommendations led to the development of the company's largest onshore asset.
- Geologist, U.S. Geological Survey, Menlo Park, CA, 1985-1987. Collected, processed and interpreted seismic datasets to interpret deep crustal structure.

Education:

- Ph.D., Civil and Env. Engineering, UC Berkeley, 1998
- M.S., Geophysics, Virginia Tech, 1990
- B.S., Geology, University of California, Santa Barbara, 1985
- Prof. Cert, Winemaking and Viticulture, UC Davis, 2009

Advisory and Editorial Positions (partial list):

- 2015-present, Council member, California Council of Science and Technology (CCST)
- 2014-present, Advisory Board, Radionuclide Waste Disposal: Development of Multi-scale Experimental and Modeling Capabilities, EPSCoR Program, South Carolina
- 2014-present, Sr Advisor, DOE Advanced Simulation Capability for Environmental Management (ASCEM)
- 2013, Helmholtz Association Review Committee
- 2012, Dept of Energy Resources Engineering Review Committee, Stanford
- 2011, Advisory Board, SmartGeo NSF IGERT, Colorado School of Mines
- 2010-present, BERAC -DOE Biological and Environmental Research Advisory Committee
- 2010-2015 Associate Editor, JGR-Biosciences
- 2010, DOE Environmental Management Technical Advisory Committee
- 2007-2013, Co-Editor, Vadose Zone Journal
- 2007-2010, Associate Editor, Journal of Hydrology
- 2006, Forschungszentrum Julich German National Laboratory Advisory Board
- 2001-2005, Associate Editor, Water Resources Research

Awards and Recognitions (partial list):

- 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, Fellow, Geological Society of America
- 2010, Birdsall-Dreiss Distinguished Lecturer, Hydrological Sciences GSA
- 2009, Frank Frischknecht Leadership Award, SEG Near Surface Geophysical Society
- 2009, Top Associate Editor Award, Journal of Hydrology
- 2008, 'Most Influential Article', SEG Leading Edge recognition
- 2002-2006 Founder and First Chair, AGU Hydrogeophysics Technical Committee

Service to Scientific Community & DOE (partial list):

- 2015, BRN-EM (Basic Research Needs for Environmental Management) lead, subsurface flow and transport panel. BRN jointly sponsored by DOE BES, BER and ASCR
- 2015, National Laboratory Engagement Day, Technical lead for DOE Subsurface Science, Washington DC
- 2015, Co-organizer, Water Energy Co-evolution DOE-UC workshop, Riverside, CA
- 2014-present, Co-lead, Subsurface crosscut 'big idea'. Working with DOE applied energy offices and 13 National Labs to develop a program plan to enable adaptive control of subsurface fractures, reactions and flow, as needed to transform the use of subsurface resources for both energy production and energy waste storage.
- 2014, Session Co-Chair, Charactering Spatiotemporal Variability of Biogeochemical and Hydrological Processes across Scales, AGU San Francisco

- 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, 2014
- 2012, Session Chair, Geophysical Characterization of Permafrost Systems, Fall AGU, San Francisco
- 2012, Lead Author, Technology Innovation ‘Virtual Laboratory’ Report, Response to Dr. Bill Brinkman request to DOE-BERAC (DOE/SC-0156)
- 2010, Co-author, DOE-SC “Grand Challenges for Biological and Environmental Research: A Long Term Vision” (DOE/SC-1035, 2010)
- 2010, Co-author and workshop co-lead, DOE-BER “Complex System Science for Subsurface Fate and Transport” (DOE/SC0123, 2010)
- 2010, Contributor, DOE-EM Long-Range Deep Vadose Zone Program Plan (DOE/RL-2010-89, 2011).
- 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, presenter- 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, Internat. Ass. Hydrological Sci. “2020 “Working Group
- 2004, Panelist, DOE BES workshop noninvasive 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 Workshop, Berkeley CA, LBNL
- 2003, Chair, Coupled Processes DOE Subsurface Science Session, EMSP, WA
- 2002, Co-Organizer, Hydrogeophysics Advanced Study Inst., Czech Republic
- 2000, Chair, Breakthroughs in Field Scale Bacterial Transport, Fall AGU, S.F.

Invited, Keynote and Plenary Speaking Engagements (partial list)

- European Geophysical Union Invited Speaker, Above and below ground characterization of Arctic functional zones, April 2015
- University of Wyoming’s Distinguished Lecturer Series, Terrestrial environment functional zones: identification and quantification using geophysical methods, Nov 24, 2014

- Complex soils systems 2014 conference, Invited Opening Presentation, Berkeley, Sept 3, 2014
- Invited presentation to Jason group on 'State of Stress in the Engineered Subsurface' June 20, 2014
- US Energy Association, Research needs in Subsurface energy science, July 23, 2014, Arlington VA
- Invited presentation, Adaptive Control of Fractures and Reactions, Shell subsurface complexity workshop, Amsterdam, Sept 2014
- Geophysical quantification of ecosystem processes across scales and system compartments, ESPM UC Berkeley seminar series, April 2014
- DO Subsurface Biogeochemistry and Terrestrial Ecosystems PI Meeting, Invited Speaker, Maryland, May 2014, Identifying ecosystem controls through joint use of above and below ground datasets
- AGU invited speaker, Characterizing Controls on Terrestrial Environment Functioning Across Scales using Geophysical Datasets, San Francisco, Dec. 2013
- Energy Biosciences Seminar Series, Berkeley, CA April 15, 2013, Advanced modeling and monitoring of microbially-mediated petroleum reservoir processes,
- Keynote Presentation, Washington Hydrology Symposium, Tacoma, WA March 2013
- Stanford Environmental fluid mechanics and hydrology colloquium, Feb 2013
- AGU 2012 Invited speaker, Advanced approaches for characterizing and exploiting micro-terroir, Invited presentation, H53F-1586 AGU, San Francisco, CA, 3-7 Dec. 2012.
- AGU 2012 invited speaker, Quantifying physicochemical heterogeneity and critical transitions that influence plume behavior using geophysical approaches and reactive transport modeling, Abstract H33N-01, presented at 2012 Fall Meeting, AGU, San Francisco, CA, 3-7 Dec. 2012.
- Invited speaker, New Perspectives in Integrated Monitoring, Assessment and Management in the Water Sector, Water Research Horizon Conference, Berlin. 'Strategies to observe hydro-biogeochemical states and processes across scales and compartments', July 8-10, 2012
- European Geophysical Union invited speaker 2012, Quantifying and Relating Subsurface and Land-Surface Variability in Permafrost Environments using Surface Geophysical and LIDAR Datasets, Vienna, April 2012
- Battelle Chlorinated Conference Keynote platform presentation, Characterization of the Distribution of Hydraulic Fractures and introduced Amendments using Geophysical Approaches, May 23-27, 2012, Monterey CA
- DOE-BERAC invited presentation, Geophysical Signatures of Subsurface Microbially Mediated Processes: Toward Quantifying In-Situ Ecosystem Functioning, 2011
- New Frontiers in Engineering Science for Sustainability, Texas A&M NSF Water Scholar Seminar, Invited, Nov 2011
- Univ Nevada Las Vegas seminar speaker, Feb 2, 2011
- Duke University distinguished seminar, Feb 23, 2011
- Advanced DOE Simulation Capability Workshop, ASCEM overview invited Presentation, Wash DC, Jan 2011

- Rensselaer University Invited seminar, May 4, 2011
- NSF Water scholar seminar series keynote, Texas A&M, College Station, November 2011
- Univ of Wisconsin, Madison invited seminar, Sept 2010
- Argonne National Laboratory distinguished speaker, Sept 2010
- Northern Illinois University, Dekalb, seminar, Sept 2010
- Michigan state, East Lansing, Oct 2010
- Grand Valley University, Michigan, Oct 2010
- Groundwater Research Association distinguished speaker, Sacramento, August 2010
- Inland Geological Society invited speaker, Riverside, CA, July 2010
- Keynote, Computational Methods in Water Resources Keynote Barcelona June 2010
- UC Davis Hydrological Seminar Series, June 2010
- National Groundwater Summit Keynote, Denver, CO April 2010
- UC Berkeley Civil and Environmental Eng. Seminar Series, April 2010
- DOE ERSP Annual PI meeting Invited speaker, March, Wash DC 2010
- Distinguished Environmental lecture, Florida International University, Feb 2010
- University of Florida Spring Seminar Series, Feb. 2010
- Delaware Environmental Institute Distinguished Lecture, March 5, 2010
- UMass Environmental lecture Series, March 9, 2010
- K. Douglas Nelson Lecture Series, Syracuse University, March 11, 2010
- Semi-Annual Dawdy Invited Lecture, Department of Geos., San Francisco SU Sept 2009.
- Oregon State University Geoscience Seminar Series, Jan 21, 2010
- Portland Environmental Geology Seminar Series Jan 2010
- New Mexico Tech Hydrology Seminar, Dec 10, 2009
- LANL's Frontiers in Geosciences' Distinguished Colloquium, Dec 2009
- AGU Invited speaker, Fall 2009 San Francisco, Dec 15, 2009
- AGU invited speaker, Spring 2009, Toronto Canada
- Stanford Environmental and Fluid Mechanics Seminar Series, Invited Seminar, 11/08
- Association for Env. Health and Sciences Invited platform speaker, San Diego, 303/09
- U.S.G.S. Water Research Division Seminar Series, 09/2008
- Gordon Conference Invited Speaker, Flow in Porous Media, Oxford England, 07/08
- NRC Workshop on Uncertainty, sensitivity and parameter estimation for multimedia environmental modeling, 7/07
- AGU invited speaker, Fall Meeting 2007, San Francisco
- UC Davis Engineering Seminar Series, 5/07
- AGU invited speaker, Fall Meeting 2006, San Francisco
- Geological Society of America invited speaker, Philadelphia, 11/06
- Groundwater Resources of California, Long Beach, 10/06
- Oregon State University 'World-Class Women in Water' seminar series, 05/06
- UCB Seismological Laboratory Spring 06 Seminar Series, 3/06
- Platform speaker, Computational Methods in Water Resources (CMWRC), Copenhagen, 06/06
- Invited Keynote, IWAGPR Conference, Delft, Netherlands, 5/05

- UC Merced Environmental Seminar Series 9/04
- PGE Distinguished Shell Speaker, UT Austin, 11/04
- Waste Management Conference Keynote, 2004
- AGU 'Union Frontier' Lecture, Spring Meeting 2005, Montreal
- Keynote DOE Characterization and Monitoring Workshop, Salt Lake City, 2004
- Univ of Buffalo, UB Geology Pegrem Speaker Series 3/04
- University of Kansas at Lawrence, Seminar Speaker, 4/04
- USGS Water Resources Seminar, Menlo Park, CA 5/04
- Heiland Distinguished Lecturer, Colorado School of Mines, Golden, Co, 2/03
- Vadose zone characterization Series, University of Arizona at Tucson, 3/03
- NRC-180 Precision Agriculture Conference, UC Davis; 2/03
- AGU invited speaker, Spring Meeting 2002, Washington DC.
- Geological Society of America invited speaker, Annual Meeting 2001, Boston
- UC Berkeley Environmental Engineering Series, 11/01
- AGU invited speaker Fall Meeting 2001, San Francisco
- IAHS Kovacs Colloquium Speaker: Groundwater Resources at Risk, Paris, 06/02
- AGU invited speaker, Spring Meeting 2001
- Boise State Geology Seminar Series, Aquifer characterization, 11/00
- UC Davis Hydrology Seminar Series, 12/00

Media & Social Media. A partial list of interviews, videos and scientific highlights in popular press focused on different aspects of my research.

- [Genomes-to-Watershed](#), December 2014 video
- Arctic research video story, December 2014: PBS KQED 'Deep Look', [The hidden perils of permafrost](#)
- Arctic research media highlight, UCB Engineering: [The underground: Studying the Arctic tundra, Innovations, February 2014 issue](#)
- Arctic research media highlight, 'Witness the Arctic' [Arcus Highlight, 2013](#)
- Arctic geophysical research media highlight, 'Imaging Permafrost' 2013 [PNAS highlight on NGEE Geophysical Efforts](#)
- Arctic Research video 2013, [You Tube Video describing NGEE project](#)
- Arctic research media highlight, [Science Today, March 12, 2012](#)
- Arctic research, [NGEE field blog](#)
- Arctic research media highlight, 'Permafrost Science Heats up in the US', [Nature News Dec 19th, 2011](#)
- Precision agriculture media highlight, [Wine Enthusiast](#), 'Water into Wine', May 2009
- Precision agriculture media highlight, CNN - Next@CNN, Nov. 1, 2003 [CNN Video Clip](#) and [Text Summary](#)
- Precision agriculture media highlight, 'Radar in the Vineyard', [Wine Business Monthly](#) Volume X, No. 11, p. 35, Nov,2003.
- Precision agriculture media highlight, [California Agriculture](#) ,Vol. 58, Number 1, Jan. 2004

- Precision agriculture media highlight, [The Economist](#), Dec. 18, 2003
- Precision agriculture media highlight, 'Radar fur die Reben', [Der Spiegel](#), Dec. 2003, Germany
- Precision agriculture media highlight, [Science News](#), May 29, 2004
- Precision agriculture media highlight, [New York Times](#) April 15, 2004
- Precision agriculture media highlight, 'Cat Scan your Soil', [California Farmer Magazine](#) Dec., 2003
- Precision agriculture media highlight, Yahoo News, April 2004
- Precision agriculture media highlight, [Vitavinicultura](#), Oct. 2003, Chili
- Precision agriculture media highlight, The Toronto Star, Dec., 2004
- Precision agriculture media highlight, [The Daily Cal](#), Berkeley, 2004
- Precision agriculture media highlight, 'Il buon vino? Lo sceglie il radar', [Corriere](#), Italy, 2004
- Precision agriculture interview and science story, TECH TV, Nov. 18th, 2003

Publications (Partial; full list and citation metrics provided at <http://esd.lbl.gov/about/staff/susanhubbard/publications.html>)

Journal Papers:

1. Berryman, J.G., T.H. Kwon, S. Doug, J.B. Ajo-Franklin, S.S. Hubbard, Analysis of laboratory data on ultrasonic monitoring of permeability reduction due to biopolymer formation in unconsolidated granular media, in press with geophysical prospecting, 2015.
2. Binley, A, S. Hubbard, J. A. Huisman, A. Revil, D. A. Robinson, K. Singha, L. D. Slater, The emergence of hydrogeophysics for improved understanding of subsurface processes over multiple scales, 2015, WRR. DOI 10.1002/2015WR017016
3. Wainwright, H., Identifying multiscale zonation and assessing the relative importance of polygon geomorphology on carbon fluxes in an Arctic Tundra Ecosystem, JGR-Biogeosciences, 10.1002/2014JG002799, 2015
4. Lam, E.V., K.S. Niel, B. Dafflon, J.E. Peterson, and S.S. Hubbard (2015), Monitoring Arctic landscape variation by pole and kite mounted cameras. SPIE 9405; DOI: 10.1117/12.2083403
5. Newman, B. D., H. M. Throckmorton, D. E. Graham, B. Gu, S. S. Hubbard, L. Liang, Y. Wu, J. M. Heikoop, E. M. Herndon, T. J. Phelps; C. J. Wilson, S. D. Wulfschleger, Microtopographic and Depth Controls on Active Layer Chemistry in Arctic Polygonal Ground, Geophysical Research Letters, 10.1002/2014GL062804 2015
6. Gangodagamage, C., J. C. Rowland, S. S. Hubbard, S. P. Brumby, A. K. Liljedahl, H. Wainwright, C. J. Wilson, G. L. Altmann, B. Dafflon, J. Peterson, C. Ulrich, C. E. Tweedie, and S. D. Wulfschleger (2014), Extrapolating active layer thickness measurements across Arctic polygonal terrain using LiDAR and NDVI data sets, Water Resources Research, 1944-7973, doi:10.1002/2013WR014283

7. Wainwright, H., J. Chen, D. Sassen, S.S. Hubbard, Bayesian Hierarchical Approach and Geophysical Datasets for Estimation of Reactive Facies over Plume Scales, *Water Resources Research*, DOI: 10.1002/2013WR013842 , 2014.
8. Wu, Y., Surasani, V.K., Li, L., Hubbard, S.S., Geophysical monitoring and reactive transport simulations of bioclogging processes induced by *Leuconostoc mesenteroides*, *Geophysics*, Vol. 79, No. 1. doi: 10.1190/GEOP2013-0121.1, 2014
9. Dafflon, B., Hubbard, S.S., Ulrich, C., Peterson, J., Electrical conductivity imaging of active layer and permafrost in an Arctic ecosystem, through advanced inversion of electromagnetic induction data, doi:10.2136/vzj2012.0161, *Vadose Zone Journal*, 2013
10. Surasani, V.K., Li, L., Ajo-Franklin, J., Hubbard, C.G., Hubbard, S.S., Wu, Y., Bioclogging and Permeability Alteration by *L. mesenteroides* in a Sandstone Reservoir: A Reactive Transport Modeling Study, *Energy and Fuels*, doi: 10.1021/ef401446f, 2013
11. Revil et al., Geochemical and geophysical responses during the infiltration of fresh water into the contaminated saprolite of the Oak Ridge Integrated Field Research Challenge site, Tennessee, *Water Resources Research*, 49(8): 4952-4970, AUG 2013, DOI: 10.1002/wrcr.20380
12. Vilcáez, J., Li, L., Hubbard, S.S., A new model for the biodegradation kinetics of oil droplets: Application to the Deepwater Horizon oil spill in the Gulf of Mexico, *Geochemical Transactions*, 2013 Oct 20;14(1):4, doi: 10.1186/1467-4866-14-4
13. Chen, J., S. Hubbard and K. Williams, Data-driven approach to identify field-scale biogeochemical transitions using geochemical and geophysical data and hidden Markov models: development and application at a uranium-contaminated aquifer, *Water Resources Research*, 2013
14. Bea, S., Wainwright, H., Spycher, N., Faybishenko, B., Hubbard, S.S., Denham, M., Identifying key controls on the behavior of an acidic-U(VI) plume in the Savannah River Site using reactive transport modeling, doi:10.1016/j.conhyd.2013.04.005.
15. Truex, M.J., Johnson, T.C., Strickland, C.E, Peterson, J.E. and Hubbard, S.S., Monitoring Vadose Zone Desiccation with Geophysical Methods, *Vadose Zone Journal*, 2013
16. Vilcáez, J., Li, L., Hubbard, S.S. 2012. Reactive Transport Modeling of Induced Selective plugging by *L. Mesenteroides* in Carbonate Formations, *Geomicrobiology Journal*, DOI:10.1080/01490451.2013.774074
17. Revil, A., Skold, M., Hubbard, S.S., Wu, Y., Watson, D., Karaoulis, M., Petrophysical properties of saprolites from the Oak Ridge Integrated Field Research Challenge site, Tennessee, *Geophysics* 78(1), p d21-d40, DOI 10.1190/GEO2012-0176.1.
18. Trautz, R.C., Pugh, J.D., Varadharajan, C., Zheng, L., Bianchi, M., Nico, Peter, Spycher, N., Newell, D.L., Esposito, R., Wu, Y., Dafflon, B., Hubbard, S.S., Birkholzer, Jens., Effect of dissolved CO₂ on a shallow groundwater system: A controlled release field experiment, dx.doi.org/10.1021/es301280t | *Environ. Sci. Technol.* 2013, 47, 298–305, 2013.
19. Wu, Y, S.S. Hubbard, C. Ulrich, S. Wullschleger Remote Quantification of Freeze Thaw Transition Using Complex Resistivity Method, doi:10.2136/vzj2012.0062, *Vadose zone Journal*, 2012.

20. Hubbard, S.S., C. Gangodagamage, B. Dafflon, H. Wainwright, J. E. Peterson, A. Gusmeroli, C. Ulrich, Y. Wu, C. Wilson, J. Rowland, C. Tweedie and S.D. Wullschleger, Quantifying and relating land-surface and subsurface variability in permafrost environments using LiDAR and surface geophysical datasets, *Hydrogeology*, 2013
21. Gasperikova, E., Hubbard, S.S., Watson, D., Baker, G., Peterson, J., Kowalsky, M., Smith, M., Brooks, S., Long-term electrical resistivity monitoring of recharge-induced contaminant plume behavior, *Journal of Contaminant Hydrology*, V 142-143, p. 33-49, 2012
22. Dafflon, B., Wu, Y., Hubbard, S.S., Birkholzer, J., Thomas, D., Pugh, J., Peterson, J., Trautz, B., Monitoring CO₂ transition and associated geochemical transformations in a shallow groundwater system using complex electrical methods, *Environmental Science and Technology*, DOI 10.1021/es301260e, 2012
23. Meyer, J., E. W. Bethel, S. S. Hubbard, J. L. Horsman, H. Krishnan, A. Romosana, P. Weber, E. Keating, T. C. Johnson, I. Gorton, L. Monroe, P. Moore, G. Flach, D. Schep, Visual Data Analysis and Exploration as an Integral Part of Environmental Management, *IEEE Transactions on Visualization and Computer Graphics*, October 2012
24. Mingliang, L., Yang, D., Chen, J., Hubbard, S.S., Calibration of a distributed flood forecasting model with input uncertainty using a Bayesian framework, *Water Resources Research*, Vol. 48, W08510, doi: 10.1029/2010WR010062, 2012.
25. Jadoon, K., L. Weihermüller, B. Scharnagl, M. B. Kowalsky, M. Bechtold, S.S. Hubbard, H. Vereecken, and S. Lambot, Full-waveform hydrogeophysical inversion of time-lapse ground-penetrating radar data to estimate the unsaturated soil hydraulic properties, doi:10.2136/vzj2011.0177, *Vadose Zone Journal*, 2011.
26. Wan, J., Tokunaga, T., Dong, W., Denham, M., Hubbard, S.S., Persistent source influences on the trailing edge of a groundwater plume, and natural attenuation timeframes: The F-Area Savannah River Site, *Environmental Science and Technology*, web released, dx.doi.org/10.1021/es204265q, 2012.
27. Li, M., D. Yang, J. Chen, and S. S. Hubbard, Calibration of a Distributed Flood Forecasting Model with Input Uncertainty Using a Bayesian Framework, VOL. 48, W08510, 20 PP., doi:10.1029/2010WR010062, *Water Resources Research*, 2012
28. Wu, Y., S.S. Hubbard, D. Wellman, Geophysical Monitoring of Foam Based Remediation Methods for Metals and Radionuclides in the Deep Vadose Zone, *Vadose Zone Journal*, DOI 10.2136/vzj2011.0160, 2011
29. Kowalsky, M., S. Finsterle, M. Commer, K. H. Williams, C. Murray, D. Newcomer, A. Englert, C. I. Steefel, S. S. Hubbard, On parameterization of the inverse problem for estimating aquifer properties using tracer data, *Water Resources Research*, doi:10.1029/2011WR011203, 2012.
30. Sassen, D., S. S. Hubbard, S. Bea, N. Spycher, J. Chen and M. Denham, Reactive facies: An approach for parameterizing field-scale reactive transport models using geophysical methods, *Water Resources Research*, 2012
31. Wu, Y., J.B. Ajo-Franklin, N. Spycher, S. S. Hubbard, G. Zhang, K. H. Williams, J. Taylor, Y. Fujita, R. Smith, Geophysical Monitoring and Reactive Transport Modeling of Ureolytically Driven Calcium Carbonate Precipitation, *Geochem Trans.* 2011; 12: 7, 2011

32. Chen, J., S. S. Hubbard, K. Williams, A. Flores Orozco, and A. Kemna, Estimating Spatio-temporal Distribution of Geochemical Parameters Associated with Biostimulation Using Spectral Induced Polarization Data and Hierarchical Bayesian Models, *Water Resources Research*, v. 48, W05555, 25p, 2012
33. Kowalsky, M., S. Finsterle, M. Commer, K. H. Williams, C. Murray, D. Newcomer, A. Englert, C. I. Steefel, S. S. Hubbard, On parameterization of the inverse problem for estimating aquifer properties using tracer data, *Water Resources Research*, doi:10.1029/2011WR011203, 2012.
34. Li, L., N. Gawande, M. B. Kowalsky, C.I. Steefel, S. S. Hubbard, Physiochemical heterogeneity controls on Uranium Bioreduction Rates at the Field scale, *DOE: 10.1021/es201111y*, *Environ. Sci. Technol.*, 2011, 45 (23), pp 9959–9966, 10.1021/es201111y, 2011
35. Scheibe, T.D., S. S. Hubbard, T. C. Onstott, M. F. DeFlaun, Lessons Learned from Bacterial Transport Research at the South Oyster Site, *Groundwater*, Vol 49, no. 5, pages 745–763, September/October 2011
36. Williamson, M., J.Meza, D. Moulton, I. Gorton, M. Freshley, P. Dixon, R. Seitz, C. Steefel, S. Finsterle, S. Hubbard, M. Zhu, K. Gerdes, R. Patterson and Y. Collazo, Advanced simulation capability for environmental management (ASCEM): an overview of initial results, *Technology and Innovation*, Vol. 13, pp. 175–199, 1949-8241/11, DOI: 10.3727/194982411X13085939956625, 2011.
37. Kowalsky, M. B., E. Gasperikova, S. Finsterle, D. Watson, G. Baker, and S. S. Hubbard , Coupled modeling of hydrogeochemical and electrical resistivity data for exploring the impact of recharge on subsurface contamination, *Water Resour. Res.*, 47, W02509, doi:10.1029/2009WR008947, 2011
38. Flores Orozco, A., K. H. Williams, P. E. Long, S. S. Hubbard, and A. Kemna, Using complex resistivity imaging to infer biogeochemical processes associated with bioremediation of an uranium-contaminated aquifer, *J. Geophys. Res.*, 116, G03001, doi:10.1029/2010JG001591, 2011.
39. Commer, M., G. A. Newman, K.H. Williams, S.S. Hubbard, 3D induced-polarization data inversion for complex resistivity, *Geophysics*, 76(3), F157-F171, 2011.
40. Hubbard, S, J. Peterson, P. Freese, J. Wolf, A. Hubbard and Y. Rubin, Statistical Integration of Advanced Characterization Datasets to Guide Vineyard Development, *Practical Winery and Vineyard*, 2011.
41. Chen, J., S. S. Hubbard, V. Korneev, D. Gaines, G. Baker, and D. Watson, Stochastic inversion of seismic refraction data for estimating watershed-scale aquifer geometry: development and application to a contaminated aquifer. *Water Resources Research*, VOL. 46, W11539, 16 PP., doi:10.1029/2009WR008715 , 2010
42. Hubbard, S.S. Understanding Vineyard Soils, *Vadose Zone Journal* 1107–1108, doi: 10.2136/vzj2010.0084br, 2010.
43. Grote, K., C. Anger, B. Kelly, S. Hubbard, and Y. Rubin, Characterization of soil water content variability and soil texture using GPR groundwave techniques, *Journal of Environmental and Engineering Geophysics*, 15(3), 93-110, 2010.

44. Williams, K.H., A.L. N'Guessan, J. Druhan, P.E. Long, S.S. Hubbard, D.R. Lovley, and J.F. Banfield, Electrode voltages accompanying stimulated bioremediation of a uranium-contaminated aquifer. *JGR-Biogeosciences*, doi:10.1029/2009JG001142, 2010.
45. Zhang, Y., S. Hubbard and S. Finsterle, A Numerical Study on Sustainable Groundwater Pumping near Rivers, *Ground Water*, DOI: 10.1111/j.1745-6584.2010.00743.x, 2010
46. Wu, Y., S.S. Hubbard, K.H. Williams, and J. Ajo-Franklin, On the complex conductivity signatures of calcite precipitation, *JGR-Biosciences*, Vol. 115, G00G04, 10 PP., doi:10.1029/2009JG001129, 2010.
47. Revil, A., C.A. Mendonca, E.A. Atekwana, B. Kulesa, S.S. Hubbard and K. Bohlen, Understanding biogeobatteries: where geophysics meets microbiology, *Journal of Geophysical Research*, V. 115 G00G02, 2010
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