

## Curriculum Vitae Steven K. Schmidt

### Education

Ph.D., Microbiology, Cornell University  
M.S., Mycology, Colorado State University  
B.S., (Magna Cum Laude), Biology, Boise State University

### Positions

2018 Interim Chair, Dept. of Ecology and Evol. Biology, U. Colorado, Boulder  
2011-2015 Chair, Dept. of Ecology and Evol. Biology, U. Colorado, Boulder  
2001-present Professor, Dept. of Ecology and Evol. Biology, U. Colorado, Boulder  
1996-2001 Associate Chair for graduate studies, Dept. of EEB.  
1993-2000 Assoc. Professor, Dept. of EEB, University of Colorado, Boulder  
1987-1993 Asst. Professor, Dept. of EEB, University of Colorado, Boulder

### Professional Societies

American Society for Microbiology  
American Association for the Advancement of Science  
American Geophysical Union

### Honors

College Scholar Award, University of Colorado, Boulder, 2015/2016  
Research Excellence Award, Boulder Faculty Assembly, 2011  
Faculty Fellowship, University of Colorado, Boulder, 2008/2009  
Junior Faculty Dev. Award, University of Colorado, Boulder  
Sage Graduate Fellowship, Cornell University  
Elon Huntington Hooker Fellowship, Cornell University

### National Panels served on (last 10 years)

NSF Integrative Ecological Physiology panel 2017  
NSF Ecosystem Studies panel 2014  
NASA Exobiology panel 2010

### Major Grants

NSF "Collaborative Research: SitS UKRI: Sensors UNDER snow, Seasonal Processes in the Evolution of Arctic Soils (SUN SPEARS)". (Co-PI with P. Sommers), 01/01/20-12/31/22  
NSF "Collaborative Research: Stochasticity and Cyroconite Community Assembly and Function" (Co-PI with D. Nemergut), 09/01/16-08/31/2020  
**The Kristina and William Catto Foundation.** "Effects of Herbicides on Mycorrhizal Fungi and Soil Ecosystems" 2017 - 2020.  
NSF "Moving uphill: Microbial Facilitation at the Leading Edge of Plant Species Distributional Shifts" (Co-PI with K. Suding), 6/1/15 - 5/31/2019.  
USAF Office of Scientific Research. "Engineering Survival Functions with Genes from Extremophilic Bacteria of the High Atacama Desert", 10/2013 – 08/2016.  
NSF "Relative Controls of Niche vs. Neutral Microbial Community Assembly Processes Over Ecosystem Function Post-Disturbance" (Co-PI with D. Nemergut) 4/2013 – 3/2017.

- NSF “The Role of Dust on Snow and Other Aeolian Inputs in Soil Formation and Biogeochemical Cycling in Barren, Alpine Catchments” 9/11 – 08/14.
- NSF “LTER: Tipping points in high-elevation ecosystems in response to changes in climate and atmospheric deposition.” \$5,640,000, 12/2010 – 11/2016. (Co-PI w/ 16 others).
- NSF “Collaborative Research: Links Between Soil Biogeochemistry and Microbial Community Dynamics Along Recently Deglaciated Chronosequences” 9/09 – 08/12.
- NSF (**Microbial Observatories**) “The Alpine Microbial Observatory: Changes in Microbial Diversity and Function Across Extreme Environmental Gradients” 10/2005 - 9/2010
- National Geographic Society** “The Aeolian Zone Revisited: Life in Earth’s Most Extreme Ecosystems” 8/2008 - 7/2009.
- NSF (**Biotic Surveys and Inventories**), “Discovery, Description, and Biogeography of Novel Alpine Fungi” 7/04 - 6/07 (Lead PI).
- NSF (**LTER**), “Long Term Ecological Research: The Landscape Continuum Model: A Biogeochemical Paradigm for High Elevation Ecosystem” 12/04-11/10, coPI.
- NSF (**Microbial Observatories**), “Microbial Biogeochemistry and Functional Diversity across the Forest-Tundra Ecotone of the Rocky Mountains” 10/00 - 9/05 (lead PI).
- National Geographic Society** “Biogeography of novel fungal lineages on three continents” 1/04 - 12/05.
- NSF, "Soil Respiration and Microbial Diversity in a Subalpine Forest". 6/1/02 - 5/31/05 (Co-PI with R. Monson).
- NSF, "Phosphorus regulation of decomposition, microbial dynamics, and foliar chemistry in moist tropical forests" 01/01/01 - 12/31/03 (Co-PI with A. Townsend).
- NSF, "Ecophysiological roles of plants, mycorrhizae, and soil microbes in early spring nitrogen dynamics", 6/99 - 5/02 (Lead PI).
- NSF (LEnEn), "Microbial Diversity and Energy Flow in Barren High Elevation Talus" 9/98 - 8/01.
- EPA, "Effects of anthropogenic nitrogen deposition on the functioning of alpine and subalpine ecosystems: N cycling and trace gas fluxes" \$9/95 - 10/99.
- NSF (LTER), "Controls on the structure, function and interactions of alpine and subalpine ecosystems of the Colorado Front Range", 1998 - 2004 (CoPI w/ 16 others).
- NSF, "Soil amino acid uptake by alpine plants and microorganisms", 1/96 - 12/98 (Co-PI with R. Monson).
- EPA, "Biotic and abiotic controls of N<sub>2</sub>O fluxes from alpine ecosystems", 8/93 - 7/96.
- NSF, "Resource storage in alpine plants", (coPI w/ R. Monson) 1992 - 1995.
- NSF (LTER), "Effects of climate change in the Colorado alpine: Ecosystem response to altered snowpack and rainfall regimes" (CoPI w/ 19 others) 1992-1998.

## Publications

- Knelman J., S.K Schmidt, E.B Graham. **2021**. Cyanobacteria in early soil development of deglaciated forefields: Dominance of non-heterocystous filamentous cyanobacteria and phosphorus limitation of N-fixing Nostocales. *Soil Biology and Biochemistry* 154: 108127
- Sommers P, DL Porazinska, JL Darcy, et al. **2020**. Microbial species–area relationships in Antarctic cryoconite holes depend on productivity. *Microorganisms* 8, 1747.
- Bueno de Mesquita CP, Sartwell, SA, Schmidt SK, Suding KN. **2020**. Growing-season length and soil microbes influence the performance of a generalist bunchgrass beyond its current range. *Ecology* 101: e03095
- Reider, K.E., and Schmidt, S.K. **2020**. Vicuña dung gardens at the edge of the cryosphere. *Ecology* 102: e03228. [10.1002/ecy.3228](https://doi.org/10.1002/ecy.3228)

- Zawierucha, K., Porazinska, D.L., Ficetola, G.F., et al. **2020**. A hole in the nematosphere: tardigrades and rotifers dominate the cryoconite hole environment, whereas nematodes are missing. *J. Zoology* <https://doi.org/10.1111/jzo.12832>
- Vimercati, L.; Bueno de Mesquita, C.P.; Schmidt, S.K. **2020**. Limited response of indigenous microbes to water and nutrient pulses in high-elevation Atacama soils: Implications for the cold-dry limits of life on Earth. *Microorganisms* 8, 1061.
- Schmidt, S.K., Sowell, P., Schubert, Z.R. et al. **2020**. Of Microbes and Mummies: Tales of Microbial Activity and Inactivity at 6000 m a.s.l. *IN Microbial Ecosystems in Central Andes Extreme Environments: Biofilms, Microbial Mats, Microbialites and Endoevaporites*. Springer International Publishing, Cham, pages 97-112.
- Sommers P., R.S. Fontenele, T. Kringen, S. Kraberger, D.L. Porazinska, J.L. Darcy, S.K. Schmidt, A. Varsani. 2019. Single-Stranded DNA Viruses in Antarctic Cryoconite Holes. *Viruses* 11: 1022 doi:10.3390/v11111022
- Bueno de Mesquita CP, Schmidt SK, Suding KN. 2019. Litter-driven feedbacks influence plant colonization of a high elevation early successional ecosystem. *Plant and Soil* 444: 71-85.
- Bueno de Mesquita CP, Brigham LM, Sommers P, Porazinska DL, Farrer EC, Darcy JL, Suding KN, Schmidt SK. 2020. Evidence for phosphorus limitation in high-elevation unvegetated soils, Niwot Ridge, Colorado. *Biogeochemistry* 147: 1-13.
- Farrer EC, Porazinska DL, Spasojevic MJ, King AJ, de Mesquita CPB, Sartwell SA, Smith JG, White CT, Schmidt SK, Suding KN 2019. Soil Microbial Networks Shift Across a High-Elevation Successional Gradient. *Frontiers Microbiology* ARTN 2887.
- Knelman JE, Schmidt SK, Garayburu-Caruso V, Kumar S, Graham EB. 2019. Multiple, Compounding Disturbances in a Forest Ecosystem: Fire Increases Susceptibility of Soil Edaphic Properties, Bacterial Community Structure, and Function to Change with Extreme Precipitation Event. *Soil Systems* ARTN 40.
- Sommers P., J.L. Darcy, D.L. Porazinska, E.M.S. Gendron, A.G. Fountain, F. Zamora, K. Vincent, K.M. Cawley, A.J. Solon, L. Vimercati, J. Ryder, S.K. Schmidt. 2019. Microbial communities in the sediments and water columns of frozen cryoconite holes in the McMurdo Dry Valleys, Antarctica. *Frontiers Microbiology* doi: 10.3389/fmicb.2019.00065
- Sommers P., D.L. Porazinska, J.L. Darcy, F. Zamora, A.G. Fountain, S.K. Schmidt. 2019. Experimental cryoconite holes as mesocosms for studying community ecology. *Polar Biology* <https://doi.org/10.1007/s00300-019-02572-7>
- Schmidt S.K., L. Vimercati L. 2019. Growth of cyanobacterial soil crusts during diurnal freeze-thaw cycles. *J. Microbiology* DOI 10.1007/s12275-019-8359-5
- Vimercati L., A.J. Solon, A. Krinsky, P. Arán, D.L. Porazinska, J.L. Darcy, C. Dorador, S.K. Schmidt. 2019. Nieves penitentes are a new habitat for snow algae in one of the most extreme high elevation environments on Earth. *Arctic, Antarctic, Alpine Res.* 51:190-200.
- Vimercati L., J.L. Darcy, S.K. Schmidt. 2019. The disappearing periglacial ecosystem atop Mt. Kilimanjaro supports both cosmopolitan and endemic microbial communities. *Sci. Reports* (In Press)
- Gendron, E.M.S., J.L. Darcy, K. Hell, S.K. Schmidt. 2019. Structure of bacterial and eukaryote communities reflect *in situ* controls on community assembly in a high-alpine lake. *J. Microbiol.* (In Press).
- Darcy J.L., S.K. Schmidt, J.E. Knelman, C.C. Cleveland, S.C. Castle, D.R. Nemergut. 2018. Phosphorus, not nitrogen, limits plants and microbial primary producers following glacial retreat. *Science Advances* 4: eaaq0942

- Darcy J.L., Gendron E.M.S., Sommers P., Porazinska D.L., Schmidt S.K. 2019. Island biogeography of cryoconite hole bacteria in Antarctica's Taylor Valley and around the world. *Frontiers Ecology Evolution* 6: 10.3389/fevo.2018.00180
- Porazinska, D.L., Farrer E.C., Spasojevic M.J., Bueno de Mesquita C.P. et al. 2018. Plant diversity and density predict belowground diversity and function in an early successional alpine ecosystem. *Ecology* 99: 1942-1952.
- Bueno de Mesquita C.P., Martinez del Río C.M., Suding K.N. et al. 2018. Rapid temporal changes in root colonization by arbuscular mycorrhizal fungi and fine root endophytes, not dark septate endophytes, track plant activity and environment in an alpine ecosystem. *Mycorrhiza* 28: 717. <https://doi.org/10.1007/s00572-018-0863-7>
- Schmidt S.K., Gendron E.M.S., Vincent K. et al. 2018. Life at extreme elevations on Atacama volcanoes: The closest thing to Mars on Earth? *Antonie van Leeuwenhoek* <https://doi.org/10.1007/s10482-018-1066-0>
- Sommers P., JL Darcy, EMS Gendron, LF Stanish, EA Bagshaw, DL Porazinska, SK Schmidt 2018. Diversity patterns of microbial eukaryotes mirror those of bacteria in Antarctic cryoconite holes. *FEMS Microbiol. Ecol.* 94: <https://doi.org/10.1093/femsec/fix167>
- Solon AJ, Vimercati L, Darcy JL, Arán P, Porazinska D, Dorador C, Farias ME, Schmidt SK (2018) Microbial communities of high-elevation fumaroles, penitentes and dry tephra "soils" of the Puna de Atacama Volcanic Zone. *Microb Ecol* doi.org/10.1007/s00248-017-1129-1
- Bueno de Mesquita, C.P., S.A. Sartwell, E.V. Ordemann et al. (2018) Patterns of root colonization by arbuscular mycorrhizal fungi and dark septate endophytes across a mostly-unvegetated, high-elevation landscape. *Fungal Ecology* 36: 63-74
- Knelman JE, Graham EB, Prevéy JS, Robeson MS, Kelly P, Hood E and Schmidt SK (2018) Interspecific plant interactions reflected in soil bacterial community structure and nitrogen cycling in primary succession. *Front. Microbiol.* 9:128. doi: 10.3389/fmicb.2018.00128
- Buscardo, E., J. Geml, S.K Schmidt, A.L.C. Silva, R.T.J. Ramos et al. 2017. Of mammals and bacteria in a rainforest: Temporal dynamics of soil bacteria in response to simulated N pulse from mammalian urine. *Functional Ecol.* DOI: 10.1111/1365-2435.12998
- Buscardo, E., J. Geml, S.K Schmidt, H. Freitas, H. Brandão da Cunha, L. Nagy. 2018. Spatio-temporal dynamics of soil bacterial communities as a function of Amazon forest phenology. *Sci. Reports* <https://doi.org/10.1038/s41598-018-22380-z>
- Castle S.C., B.W. Sullivan, J.E. Knelman, E. Hood, D.R. Nemergut, S.K. Schmidt, C.C. Cleveland. 2018. Nutrient limitation of soil microbial activity during the earliest stages of ecosystem development. *Oecologia* 185: 513-524.
- Bueno de Mesquita, CP, J.E. Knelman, A.J. King, E.C. Farrer, D.L. Porazinska, S.K. Schmidt, K.N. Suding. 2017. Plant colonization of moss-dominated soils in the alpine: Microbial and biogeochemical implications. *Soil Biol. Biochem.* 111: 135-142.
- Schmidt S.K., J. L. Darcy, P. Sommers, E. Gunawan, J. E. Knelman, K. Jager. 2017. Freeze-thaw revival of rotifers and algae in a desiccated, high elevation (5500 meters) microbial mat, high Andes, Perú. *Extremophiles* 21: 573-580.
- Schmidt S.K., L. Vimercati, J.L. Darcy, P. Arán, E.M.S. Gendron, A.J. Solon, D. Porazinska, C. Dorador. 2017. A *Naganishia* in high places: functioning populations or dormant cells from the atmosphere? *Mycology* doi: 10.1080/21501203.2017.1344154
- Darcy J.L., A.J. King, E.M.S. Gendron, S.K. Schmidt. 2017. Spatial autocorrelation of microbial communities atop a debris-covered glacier is evidence of a supraglacial chronosequence. *FEMS Microbiol. Ecol.* 10.1093/femsec/fix095
- Castle, S.C., D.R. Nemergut, A.S. Grandy, J.W. Leff; E.B. Graham, E. Hood; S.K. Schmidt, K. Wickings, C.C. Cleveland. 2016. Biogeochemical drivers of microbial community convergence across actively retreating glaciers. *Soil Biol. Biochem.* 101:74-84.

- Schmidt, S.K., D. Porazinska, B.-L. Concienne, J.L. Darcy, A.J. King, D.R. Nemergut. 2016. Biogeochemical stoichiometry reveals P and N limitation across the post-glacial landscape of Denali National Park, Alaska. *Ecosystems* 19: 1164–1177.
- Darcy, J.L. and S.K. Schmidt. 2016. Nutrient limitation of microbial phototrophs on a debris-covered glacier. *Soil Biol. Biochem.* 95: 156-163
- Nemergut D.R., J.E. Knelman, S. Ferrenberg, T. Bilinski, B. Melbourne, L. Jiang, C. Violle, J.L. Darcy, T. Prest, S.K. Schmidt and A.R. Townsend. 2016. Decreases in average bacterial community rRNA operon copy number during succession. *ISME Journal* 10: 1147-1156.
- Vimercati L., S. Hamsher, Z. Schubert, S.K. Schmidt. 2016. Growth of a high-elevation *Cryptococcus* sp. during extreme freeze-thaw cycles. *Extremophiles* 20: 579-588.
- Bueno de Mesquita, CP, A.J. King, S.K. Schmidt, E.C. Farrer, K.N. Suding. 2015. Incorporating biotic factors in species distribution modeling: are interactions with soil microbes important? *Ecography* 39: 970–980.
- Liptzin, D., D. Helmig, S.K. Schmidt, B. Seoka, M.W. Williams. 2015. Winter gas exchange between the atmosphere and snow-covered soils on Niwot Ridge, Colorado, USA. *Plant Ecology & Diversity* doi 10.1080/17550874.2015.1065925
- Nemergut D.R., J.E. Knelman, S. Ferrenberg, T. Bilinski, B. Melbourne, L. Jiang, C. Violle, J.L. Darcy, T. Prest, S.K. Schmidt and A.R. Townsend. 2015. Decreases in average bacterial community rRNA operon copy number during succession. *ISME Journal* doi: 10.1038/ismej.2015.191
- Knelman J.E., E.B. Graham, N.A. Trahan, S.K. Schmidt and D.R. Nemergut. 2015. Fire severity shapes plant colonization effects on bacterial community structure, microbial biomass, and soil enzyme activity in secondary succession of a burned forest. *Soil Biol. Biochem.* 90: 161-168.
- Schmidt, S.K. and J.L. Darcy. 2015. Phylogeography of ulotrichalean soil algae from extreme high altitude and high latitude ecosystems. *Polar Biology* 38: 689-697.
- Schmidt, S.K., A.J. King, C.L. Meier, W.D. Bowman, E.C. Farrer, K.N. Suding, D.R. Nemergut. 2015. Plant-microbe interactions at multiple scales across a high-elevation landscape. *Plant Ecology and Diversity* doi: 10.1080/17550874.2014.917737
- Knelman J.E., S.K. Schmidt, R.C. Lynch, J.L. Darcy, S.C. Castle, et al. 2014. Nutrient addition dramatically accelerates microbial community succession. *PLoS ONE* 9(7): e102609. doi: 10.1371/journal.pone.0102609
- Schmidt, S.K., D. R. Nemergut, J.L. Darcy, R Lynch. 2014. Do bacterial and fungal communities assemble differently during primary succession? *Molecular Ecology* 23: 254-258.
- Lynch, R.C., J.L. Darcy, N.C. Kane, D.R. Nemergut, S.K. Schmidt. 2014. Metagenomic evidence for metabolism of trace atmospheric gases by high-elevation desert Actinobacteria. *Frontiers Microbiol.* (In Press)
- Naff, C.S., J.L. Darcy and S.K. Schmidt. 2013. Phylogeny and biogeography of an uncultured clade of Snow Chytrids. *Environmental Microbiology* 15: 2672-2680.
- Schmidt, S.K., S.R. Frankel, R.L. Wagner and R.C. Lynch. 2013. Do growth kinetics of snow-mold fungi explain exponential CO<sub>2</sub> fluxes through the snow? Pp 245-254, IN *Plant and microbe adaptation to cold in a changing world*. R. Imai et al. ed. Springer, New York.
- Ferrenberg, S., S. O'Neill, J. Knelman, B. Todd, S. Duggan, D. Bradley, T. Robinson, S. K. Schmidt, et al. 2013. Changes in assembly processes in soil bacterial communities following a wildfire disturbance. *ISME Journal* 7: 1102-1111
- Nemergut DR, Schmidt SK, Fukami T, O'Neill SP, Legg TM, Stanish L, Knelman JE, Darcy JL, Lynch RC, Wickey P, Ferrenberg S. 2013. Patterns and Processes of Microbial Community Assembly. *Microbiol. Mol. Biol. Rev.* 77: 342-356.

- Rhodes, M., J. Knelman, R.C. Lynch, J.L. Darcy, D.R. Nemergut and S.K. Schmidt. 2013. Structure and Function of Prokaryotic Communities in Soils of Polar and High Elevation Deserts. pp. 201-213 *IN* E. Rosenberg, E. Delong et al. (eds.), *The Prokaryotes*, DOI 10.1007/978-3-642-30123-0\_37, Springer-Verlag, Berlin.
- Lynch, R.C., A.J. King, M.E. Fariás, P. Sowell, C. Vitry and S.K. Schmidt. 2012. The potential for microbial life in the highest elevation (>6000 m.a.s.l.) mineral soils of the Atacama region. *J. Geophys. Res.* 117: G02028
- Schmidt, S.K., D.R. Nemergut, B.T. Todd, R.C. Lynch, J.L. Darcy, C.C. Cleveland and A.J. King. 2012. A simple method for determining limiting nutrients for photosynthetic crusts. *Plant Ecology and Diversity* 5: 513-519.
- King, A.J., E.C. Farrer, K.N. Suding, S.K. Schmidt. 2012. Co-occurrence patterns of plants and soil bacteria in the high-alpine subnival zone track environmental harshness. *Frontiers in Microbiology* 3: doi: 10.3389/fmicb.2012.00347
- Mladenov, N., M.W. Williams, S.K. Schmidt and K. Cawley. 2012. Atmospheric deposition as a source of carbon and nutrients to an alpine catchment of the Colorado Rocky Mountains. *Biogeosciences* 9: 3337-3355.
- Marano, A.V., J.E. Edwards, F.H. Gleason, F. Bärlocher, C.L.A. Pires-Zottarelli, O. Lilje, S.K. Schmidt, S. Rasconi, M. Kagami, M.D. Barrera, T. Sime-Ngando, S. Boussiba. 2012. Quantitative methods for the analysis of zoospore fungi. *J. Microbiol. Methods* 89: 22-32.
- Schmidt, S.K., C.S. Naff and R.C. Lynch. 2012. Fungal communities at the edge: Ecological lessons from high alpine fungi. *Fung. Ecol.* 5: 443-452.
- Schmidt, S.K., R.C. Lynch, A.J. King, D. Karki, M.S. Robeson, L. Nagy, M.W. Williams, M.S. Mitter and K.R. Freeman. 2011. Phylogeography of microbial phototrophs in the dry valleys of the high Himalayas and Antarctica. *Proc. Roy Soc. B* 278: 702-708.
- Darcy, J.L., A.J. King, M.S. Robeson and S.K. Schmidt. 2011. Global distribution of *Polaromonas* phylotypes - evidence for a highly successful dispersal capacity. *PLoS ONE* 6(8): e23742.
- Robeson, M.S. A.J. King, K.R. Freeman, C.W. Birky, A.P. Martin and S.K. Schmidt. 2011. Soil Rotifer communities are extremely diverse globally but spatially autocorrelated locally. *Proc. Natl. Acad. Sci. USA* 108: 4406-4410.
- Schmidt, S.K., C.C. Cleveland, D.R. Nemergut, S.C. Reed, A.J. King and P. Sowell. 2011. Estimating phosphorus availability for microbial growth in an emerging landscape. *Geoderma* 163: 135-140.
- Nemergut, D.R., E.K. Costello, M. Hamady, C. Lozupone, L. Jiang, S.K. Schmidt, N. Fierer, A.R. Townsend, C.C. Cleveland, L. Stanish and R. Knight. 2011. Global patterns in the biogeography of bacterial taxa. *Environ. Microbiol.* 13: 135-144.
- King, A.J., K.R. Freeman, C.A. Lozupone, R. Knight and S.K. Schmidt. 2010. Biogeography and habitat modelling of high-alpine bacteria. *Nature Commun.* 1:53 doi: 10.1038/ncomms1055.
- Gleason, F, S.K. Schmidt, and A. Marano. 2010. Can zoospore true fungi grow or survive in extreme or stressful environments? *Extremophiles* 14: 417-425.
- King, A.J., D. Karki, L. Nagy, A. Racoviteanu and S.K. Schmidt. 2010. Microbial biomass and activity in high elevation soils of the Annapurna and Sagarmatha regions of the Nepalese Himalayas. *Himalayan J. Sci.* doi: 10.3126/hjs.v6i8.2303.
- Freeman, K.R., A.P. Martin, D. Karki, R.C. Lynch, M.S. Mitter, A.F. Meyer, J.E. Longcore, D.R. Simmons and S.K. Schmidt. 2009. Evidence that chytrids dominate fungal communities in high-elevation soils. *Proc. Natl. Acad. Sci. USA* 106: 18315-18320.
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- Robeson, M.S., E.K. Costello, K.R. Freeman, J. Whiting, B. Adams A.P. Martin & S.K Schmidt. 2009. Environmental DNA sequencing primers for eutardigrades and bdelloid rotifers. *BMC Ecology* doi:10.1186/1472-6785-9-25.
- Seimon, A., Yager, K., Seimon, T., Schmidt, S.K., Grau, A., Beck, S., García, C., Tupayachi, A., Sowell, P., Touval, J. & Halloy, S. 2009. Changes in Biodiversity Patterns in the High Andes - Understanding the Consequences and Seeking Adaptation to Global Change. *Mountain Forum Bulletin* 9: 25-27.
- Schmidt S.K., D.R. Nemergut, A.E. Miller, K.R. Freeman, A.J. King, A. Seimon. 2009. Microbial activity and diversity during extreme freeze-thaw cycles in periglacial soils, 5400 m Elevation, Cordillera Vilcanota, Perú. *Extremophiles* 13: 807-816.
- Freeman, K.R., M.Y. Pescador, S.C. Reed, E.K. Costello, M.S. Robeson and S.K. Schmidt. 2009. Soil CO<sub>2</sub> flux and photoautotrophic community composition in high-elevation, “barren” soils. *Environ. Microbiol.* 11: 674-686.
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- Schmidt, S.K., K.L. Wilson, R.K. Monson and D.A. Lipson. 2009. Exponential growth of “snow molds” at sub-zero temperatures: an explanation for high beneath-snow respiration rates and Q<sub>10</sub> values. *Biogeochemistry* 95: 13-21.
- Costello, E.K., S.R.P. Halloy, S.C. Reed, P. Sowell, S.K. Schmidt. 2009. Fumarole-supported islands of biodiversity within a hyperarid, high-elevation landscape on Socompa Volcano, Puna de Atacama, Andes. *Appl. Environ. Microbiol.* 75: 735-747.
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- Schmidt, S.K., L.C. Sobieniak-Wiseman, S.A. Kageyama, S.R.P. Halloy and C.W. Schadt. 2008. Mycorrhizal and dark-septate fungi in plant roots above 4270 meters elevation in the Andes and Rocky Mountains. *Arctic, Antarctic and Alpine Res.* 40: 576-583.
- Schmidt, S.K., K.L. Wilson, M.M. Gebauer, A.F. Meyer and A.J. King. 2008. Phylogeny and ecophysiology of opportunistic “snow molds” from a sub-alpine forest ecosystem. *Microbial Ecology* 56: 681-687.
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