

Ronald Sigmund Sletten—Curriculum Vita May 2013

Education

BS (microbiology), BA (chemistry) 1979 University of Washington

MS (civil engineering) 1987 University of Washington Thesis Title: Aragonite Formation in Polar Soils.

Ph.D. (civil engineering) 1995 University of Washington, Dissertation Title: Characteristics of fulvic and humic acids isolated from various sources and their role in Fe and Al mobilization.

Professional Experience

2004 Research Associate Professor, Earth and Space Sciences, University of Washington

1997-2004 Research Assistant Professor, Geological Sciences, University of Washington

1999 Guest Professor, University of Copenhagen

1995-1997 Postdoctoral Research Associate, Geological Sciences, University of Washington

1995-1996 Guest Professor, Agricultural University, Vienna, Austria

1991-1995 Doctoral Candidate, Civil Engineering, University of Washington

1987-1993 Research Assistant, Civil Engineering, University of Washington

1983-1987 Laboratory managers, College of Forest Resources, Univ. of Washington

1982-1983 Construction Manager, Trans Alaska Pipeline, Prudhoe Bay

Research Interests

Biogeochemistry and ecology of northern ecosystems, Arctic/Antarctic permafrost processes and geomorphology, Mars Science Laboratory collaborator, dissolved organic carbon metal complexation, arsenic chemistry.

Teaching

Environmental Chemistry, Paleoenvironmental Reconstruction, Water in the environment

Professional Certifications

E.I.T. certified

Publications

Ronald S. Sletten, B. H., John Stone, Birgit Hagedorn, David Gilichinsky (In prep.). Ancient landscapes-active surfaces in the Dry Valleys, Antarctica: the role of ground ice and contraction cracks.

Liu, L., R. S. Sletten, et al. (In prep). "An Enhanced Model of Ground Ice Stability in Beacon Valley, Antarctica Using Long-term Meteorological and Soil Moisture Data." Journal of Geophysical Research In prep.

Toner, J. D., J. K. Feathers, et al. (In prep.). "Luminescence ages of fluvial terraces in Taylor Valley, Antarctica."

Toner, J. D. and R. S. Sletten (2013). The formation of Ca-Cl-rich groundwaters in the Dry Valleys of Antarctica: Field measurements and modeling of reactive transport. *Geochimica et Cosmochimica Acta* 110(0): 84-105.

- Toner, J. D., R. S. Sletten and M. L. Prentice (2013). Soluble salt accumulations in Taylor Valley, Antarctica: Implications for paleolakes and Ross Sea Ice Sheet dynamics. *Journal of Geophysical Research: Earth Surface*. DOI: 10.1029/2012jf002467
- Alexander, B., D. Allman, et al. (2012). "Isotopic constraints on the formation pathways of sulfate aerosol in the marine boundary layer of the subtropical northeast Atlantic Ocean." *Journal of Geophysical Research: Atmospheres* (1984–2012) 117(D6).
- Abramov, A., R. Sletten, et al. (2011). "Antarctica, ice-free areas, permafrost, temperature regime, active layer." *EARTH* 15(3): 3-19.
- Hallet, B., R. Sletten and K. Whilden (2011). Micro-relief development in polygonal patterned ground in the Dry Valleys of Antarctica. *Quaternary Research* 75(2): 347-355.
- Meyer, H. and R. S. Sletten (2011). Preface to the Special Issue on Stable Isotopes and Geochemistry of Ground Ice. *Permafrost and Periglacial Processes* 22(1): 1-2.
- Hallet, B., R. Sletten and K. Whilden (2011). Micro-relief development in polygonal patterned ground in the Dry Valleys of Antarctica. *Quaternary Research* 75(2): 347-355.
- Burnham, J. H. and R. S. Sletten (2010). Spatial distribution of soil organic carbon in northwest Greenland and underestimates of high Arctic carbon stores. *Global Biogeochemical Cycles* 24: 14p.
- Hagedorn, B., R. S. Sletten, B. Hallet, D. F. McTigue and E. J. Steig (2010). Ground ice recharge via brine transport in frozen soils of Victoria Valley, Antarctica: Insights from modeling $\delta^{18}\text{O}$ and δD profiles. *Geochimica et Cosmochimica Acta* 72(2): 435-448.
- Kokorowski, H. D., P. M. Anderson, R. S. Sletten, A. V. Lozhkin and T. A. Brown (2008). Late Glacial and Early Holocene Climatic Changes Based on a Multiproxy Lacustrine Sediment Record from Northeast Siberia. *Arctic, Antarctic, and Alpine Research* 40(3): 497-505.
- Sullivan, P. F., J. M. Welker, H. Steltzer, R. S. Sletten, B. Hagedorn, S. J. T. Arens and J. L. Horwath (2008). Energy and water additions give rise to simple responses in plant canopy and soil microclimates of a high arctic ecosystem. *Journal of Geophysical Research* 113: G03s08.
- Horwath, J. L., R. S. Sletten, B. Hagedorn and B. Hallet (2008). Spatial and Temporal Distribution of Soil Organic Carbon in Non-sorted Striped Patterned Ground of the High Arctic. *Journal of Geophysical Research* 113: G03S07.
- Gilichinsky, D. A., G. S. Wilson, E. I. Friedmann, C. P. McKay, R. S. Sletten, E. M. Rivkina, T. A. Vishnivetskaya, L. G. Erokhina, N. E. Ivanushkina, G. A. Kochkina, V. A. Shcherbakova, V. S. Soina, E. V. Spirina, E. A. Vorobyova, D. G. Fyodorov-Davydov, B. Hallet, S. M. Ozerskaya, V. A. Sorokovikov, K. S. Laurinavichyus, A. V. Shatilovich, J. P. Chanton, V. E. Ostroumov and J. M. Tiedje (2007). Microbial Populations in Antarctic Permafrost: Biodiversity, State, Age, and Implication for Astrobiology. *Astrobiology* 7(2): 275-311.
- Hagedorn, B., R. S. Sletten and B. Hallet (2007). Sublimation and ice condensation in hyperarid soils: Modeling results using field data from Victoria Valley, Antarctica. *Journal of Geophysical Research Earth Surfaces* 112: F03017, doi:10.1029/2006JF000580.

- Sletten, R. S., D. H. Mann, W. C. McIntosh, N. W. Dunbar, M. L. Prentice, W. Dickinson and J. O. Stone (2007). Possible redeposition of volcanic ashes in the Dry Valleys by glacier transport: in Antarctica. *A Keystone in a Changing World - Online Proceedings of the 10th ISAES*. A. K. Cooper, C. R. Raymond and ISAES Editorial Team: Extended Abstract 158, 4 p.
- Barrett, J. E., R. A. Virginia, D. W. Hopkins, J. Aislabie, R. Bargagli, J. G. Bockheim, I. B. Campbell, W. B. Lyons, D. Moorhead, J. Nkem, R. S. Sletten, H. Steltzer, D. H. Wall and M. Wallenstein (2006). Terrestrial Ecosystem Processes of Victoria Land, Antarctica. *Soil Biology and Biochemistry* 38(10): 3019-3034.
- Grant, S. A., G. E. Boitnott, C. J. Korhonen and R. S. Sletten (2006). Effect of temperature on hydration kinetics and polymerization of tricalcium silicate in stirred suspensions of CaO-saturated solutions. *Cement and Concrete Research* 36(4): 671-677.
- Ng, F., B. Hallet, R. S. Sletten and J. O. Stone (2005). Fast-growing till over ancient ice in Beacon Valley, Antarctica. *Geology* 33(2): 121-124.
- Kramer, M. G., P. Sollins and R. S. Sletten (2004). Soil carbon dynamics across a windthrow disturbance sequence in Southeast Alaska. *Ecology* 85(8): 2230-2244.
- Hallet, B., J. Putkonen, R. S. Sletten and J. N. Potter (2004). Advances in Permafrost Process Research in the United States since 1960s. *The Quaternary Period in the United States*. A. Gillespie, S. P. Porter and B. Atwater. Amsterdam, Elsevier: 127-145.
- Anders, A. M., R. S. Sletten, L. A. Derry and B. Hallet (2003). Germanium/silicon ratios in the Copper River Basin, Alaska: Weathering and partitioning in periglacial versus glacial environments. *Journal of Geophysical Research* 108(F1): 6005, doi:10.1029/2003JF000026.
- Kramer, M. G., P. Sollins, R. S. Sletten and P. K. Swart (2003). N isotope fractionation and measures of organic matter alteration during decomposition. *Ecology* 84(8): 2021-2025.
- Sletten, R. S., B. Hallet and R. C. Fletcher (2003). Resurfacing time of terrestrial surfaces by the formation and maturation of polygonal patterned ground. *Journal of Geophysical Research* 108(E4): 8044, doi:10.1029/2002JE001914.
- Grant, S.A. and R.S. Sletten (2002). Calculating capillary pressures in frozen and ice-free soils below the melting temperature. *Environmental Geology* 42(2-3): 130-136.
- Mironenko, M.V., G.E. Boitnott, S.A. Grant, and R.S. Sletten (2001). Experimental determination of the volumetric properties of NaCl solutions to 258 K. *Journal of Physical Chemistry B* 105 (41): 9909-9912
- Lombi, E., R.S. Sletten, and W.W. Wenzel (2000). Sequentially extracted arsenic from different size fractions of contaminated soils, *Water Air and Soil Pollution*, 124 (3-4), 319-332
- Jandl, R. and R.S. Sletten (1999). "Mineralization of forest soil carbon: Interactions with metals." *Journal of Plant Nutrition and Soil Science Zeitschrift Fur Pflanzenernahrung Und Bodenkunde* 162(6): 623-629.
- Banks, D., U. Siewers, R. S. Sletten, S. Haldorsen, B. Dale, M. Heim, and B. Swensen 1998 The thermal springs of Bockfjord, Svalbard: II: Selected aspects of trace element hydrochemistry. *Geothermics* 28:713-728
- Lombi, E., W. W. Wenzel, R.S. Sletten (1999). "Arsenic adsorption by soils and iron-oxide-coated sand: kinetics and reversibility." *Journal of Plant Nutrition and Soil Science Zeitschrift Fur Pflanzenernahrung Und Bodenkunde* 162(4): 451-456.

- Banks, D., R. S. Sletten, S. Haldorsen, B. Dale, M. Heim, and B. Swensen (1998) The thermal springs of Bockfjord, Svalbard: Occurrence and major ion hydrochemistry. *Geothermics* 27(4):445-467
- Korshin, G.V., M.M. Benjamin and R.S. Sletten 1997 Adsorption of natural organic matter (NOM) on iron oxide: Effects on NOM composition and formation of organo- halide compounds during chlorination. *Water Research* 31(7):1643-1650
- Wenzel, W.W., R.S. Sletten, G. Wieshammer, A. Brandstetter, and G. Stingeder. 1997 Adsorption of trace metals by tension lysimeters: nylon membrane versus porous ceramic cup. *Journal of Environmental Quality* 26:1430-1434.
- Wenzel, W.W., W. E. H. Blum, A. Brandstetter, R. S. Sletten, and G. Wieshammer. 1997 Ni and Al mobilization along a soil pH transect in forest soils of the Günser Mountains, Austria, *Proceedings of 3rd International Conference on the Biochemistry of Trace Elements, Paris 1995* (in press)
- Haldorsen, S. , G. Riise, R.S. Sletten and B. Swensen. 1997. Environmental isotopes as tracers in catchments. In: *Geochemical processes, weathering and groundwater recharge in catchments*, O.M. Saether and P. de Caritat (Editors), A.A. Balkema, Rotterdam, 185-210.
- Benjamin, M. M., R. S. Sletten, R. P. Bailey, and T. Bennett. 1996 Sorption and filtration of metals using iron-oxide-coated sand. *Water Research* 30(11):2609-2620.
- Mann, D.H., Sletten, R.S., and Reanier, R.E. 1996 Quaternary glaciations of the Rongbuk Valley, Tibet. *Journal of Quaternary Science* 11(4):267-280.
- Brandstetter, A., R. S. Sletten, A. Mentler and W. W. Wenzel. 1996. Estimating dissolved organic carbon in natural waters by UV absorbance (254 nm). *Zeitschrift für Pflanzenernährung und Bodenkunde* 159: 605-607
- Sletten, R. S., M. M. Benjamin, J. J. Horng, and J. F. Ferguson. 1995. Physical-chemical treatment of landfill leachate for metals removal. *Water Research* 29:2376-2386
- Tatur, A., A. Barczuk, R. del Valle, R. S. Sletten, and E. Kicinska. 1993. Surface mineralization on Seymour Island, Antarctica. *Polish Polar Research* 14:153-168
- Sletten, R. S. 1993. Laboratory simulation of dolomite and limestone dissolution: rates, yield, and mineralogy of fine-grained residue, *VI International Conference on Permafrost Proceedings*, Beijing, China, p. 580-585
- Zabowski, D. and R. S. Sletten. 1991. Carbon dioxide degassing effects on the pH of Spodosol soil solutions. *Soil Sci. Soc. Am. J.* 55: 1456-1461
- Dahlgren, R.A., F.C. Ugolini, S. Shoji, T. Ito, and R.S. Sletten (1991). Soil-forming processes in Alic Melanudands under Japanese pampas grass and oak, *Soil Science Society of America Journal*, 55 (4), 1049-1056
- Sletten, R. S. and Ugolini, F. C. 1990. Pedogenic processes in well-drained soils of Spitsbergen and Nordaustlandet. *Inter-Nord* 19: 465-470
- Ugolini, F. C. and R. S. Sletten. 1990. The role of proton donors in pedogenesis as revealed by soil solution studies. *Soil Science* 151: 59-75
- Ugolini, F. C., R. S. Sletten, and D. Marrett. 1990. Contemporary pedogenic processes in the Arctic: brunification. *Science Du Sol* 28: 333-348
- Ugolini, F. C. and R. S. Sletten. 1988. Genesis of Arctic Brown Soils (Pergelic Cryochrept) in Svalbard, *V International Conference on Permafrost Proceedings*, Trondheim, Norway, p. 478-483

- Sletten, R. S. 1988. The Formation of Pedogenic Carbonates on Svalbard: The Influence of Cold Temperatures and Freezing, *V International Conference on Permafrost Proceedings*, Trondheim, Norway, p. 467-472
- Sletten, R. S. 1987. Aragonite formation in polar soils. Master's thesis, University of Washington, Seattle, WA
- Mann, D. H., R. S. Sletten and F. C. Ugolini. 1986. Soil Development at Kongsfjorden, Spitsbergen. *Polar Research* 4: 1-16

Reports and non-refereed papers

- 1998 Arsenic in Soils of Austria-Final report to the Austrian Environmental Ministry
- 1996 Basal processes at subfreezing temperatures: Meserve glacier revisited. *Antarctic Journal* (H. Conway, K. Cuffey, A.M. Gades, B. Hallet, C.F. Raymond and R. Sletten)
- 1992 Metals treatment at superfund sites by adsorptive filtration. Report to EPA. (with Mark Benjamin)
- 1989 Treatment of Cedar Hills landfill leachate prior to discharge to municipal sewage system
- 1987 Analysis efficacy of fly ash to purify effluent from Tacoma sewage treatment plant (Dellchem process). (for John Ferguson and David Stensel)
- 1986 Sediment analysis from hydroblast site for preparation of ship hulls (for David Stensel)
- 1985 Procedure manual for soil and water chemistry analyses.
- 1984 Analyses of paper and pulp waste from MacMillan Bloedel Ind. (for John Ferguson)

Field work

- 2010 Svalbard and northern Siberia
- 1995-2011 Ten field seasons in Antarctica Dry Valleys
- 2002-2013 Over 20 excursions to Thule and Kangerlussaq, Greenland
- 1997-1999 Cooperative field study at Zackenberg, Greenland with Geographic Institute, Copenhagen
- 1996 Geochemistry and stable isotope study on karst system on Spitsbergen
- 1996 Chemistry of Meserve Glacier basal ice and evaluation of polygon growth in Dry Valleys, Antarctica
- 1991 to 1995 Soils and plant physiology study in Canadian High Arctic, Devon Island, NWT, Canada

Select recent published abstracts

- Parker, T., M. Malin, et al. (2013). "Localization and Contextualization of Curiosity in Gale Crater, and Other Landed Mars Missions." *LPI Contributions* 1719: 2534.
- Hallet, B., R. Sletten, et al. (2013). "Fracture Networks, Gale Crater, Mars." *LPI Contributions* 1719: 3108.
- Sletten, R. (2011). Morphological Development of Polygonal Patterned Ground and Associated Sand Wedges in Dry Valleys, Antarctica. AGU Fall Meeting Abstracts.
- Liu, L., R. Sletten, et al. (2011). An Enhanced Vapor Transport and Sublimation Model using 10+ Years of Field Measurements of Earth's Oldest Ground Ice in Beacon Valley, Antarctica. AGU Fall Meeting Abstracts.

- Liu, L., R. S. Sletten, et al. (2011). An enhanced vapor transport and sublimation model using 10+ years of field measurements of Earth's oldest ground ice in Beacon Valley, Antarctica. American Geophysical Union, Fall Meeting 2011, abstract #C33B- 0641, San Francisco.
- R.S. Sletten, B. Hallet, and J.O. Stone (2009) Hyperinflation of surfaces in lower Beacon Valley, Dry Valleys, Antarctica: Implication for paleoenvironmental reconstruction/ Eos Trans., Fall Meet. Suppl., Abstract C41A-0446.
- Sletten, R. S., B. Hagedorn, B. Hallet and E. J. Steig (2004). Constraining formation and stability of subsurface ice in the Dry Valleys: an integrating study of observations of stable isotopes, salt translocation, and climatic data. SCAR 2004, Potsdam, Germany.
- Sletten, R. S. and B. Hallet (2004). Extreme soil inflation in the Dry Valleys, Antarctica. Geological Society of America Annual Meetings; Invited Talk, Seattle.
- Toner, J. D. and R. S. P. Sletten, M L (2008). Soil Processes on Delta and Till Deposits in Taylor Dry Valley, Antarctica. Eos Trans. AGU, 89(53), Fall Meet. Suppl., Abstract C11D-0533.
- Sletten, R.S. 1998 Assessing Risks of Contaminant Dispersion In Permafrost Terrains, Invited participant, NATO ARW: Permafrost Response on Economic Development, Environmental Security and Natural Resource Potential, Novosibirsk, Russia, 12-15 November 1998
- Cuffey, K., H. Conway, A. Gades, B. Hallet, R. Sletten and C. Raymond 1996. Tunneling in the name of science: Meserve glacier revisited. *American Geophysical Union Fall Meeting*, San Francisco U42E-09.
- Hallet, B., K. Whilden and R.S. Sletten 1996. 30+ Year Displacement Measurements in Permafrost Polygons, Dry Valleys, Antarctica. *American Geophysical Union Fall Meetings*, 1996 Fall meeting, EOS 77(46), 57, San Francisco U42E-08.
- Wenzel, W.W., A. Brandstetter, And R.S. Sletten 1996. Historical and Present Soil Acidification And Metal Mobilization In Central European Forest Soils. *Agronomy Abstracts*, Indianapolis, IN
- Sletten, R.S. 1996 Cryptogamic Crust Effects on Soil Weathering, Nutrients, and Stability in High Arctic Soils. *Agronomy Abstracts*, Indianapolis, IN
- Sletten, R.S. 1995. Carbon biogeochemistry in High Arctic soils. *Frozen Ground Workshop*, Hanover, NH.