

Suzanne Prestrud Anderson

Institute of Arctic and Alpine Research and Department of Geological Sciences
University of Colorado, Campus Box 450, Boulder, CO 80309
e-mail Suzanne.Anderson@colorado.edu; phone 303-492-7071; fax 303-492-6388
<https://orcid.org/0000-0002-6796-6649>

Education

- Ph.D., Geology, University of California, Berkeley 1995
Dissertation: “Flow paths, solute sources, weathering, and denudation rates: The chemical geomorphology of a small catchment”, *Advisor:* William E. Dietrich
- M.S., Geology, University of Washington 1987
Thesis: “The upfreezing process and its role in sorted circles”, *Advisor:* Bernard Hallet
- B.S. cum laude, Chemistry, University of Puget Sound, Tacoma, Washington 1979

Positions held

- Professor*, Dept. of Geological Sciences, University of Colorado, Boulder 2019-present
- Professor*, Dept. of Geography, University of Colorado, Boulder 2016-2018
- Visiting Professor*, Laboratory of HYdrology and GEochemistry of Strasbourg (LHYGES)
University of Strasbourg, France 2012
- Fellow*, Institute of Arctic and Alpine Research (INSTAAR) 2009-present
- Associate Professor*, Dept. of Geography, University of Colorado at Boulder 2009-2016
- Assistant Professor*, Dept. of Geography, University of Colorado at Boulder 2004-2009
- Research Associate*, INSTAAR, University of Colorado at Boulder 2003-2009
- Assistant Research Scientist*, Institute of Tectonics/CSIDE, UC Santa Cruz 1997-2003
- Lecturer*, Dept. of Earth Sciences, UC Santa Cruz 1997-1999
- NSF Earth Sciences Post-doctoral Fellow*, University of Wyoming 1995-1997
- Mentors:* James I. Drever and Neil F. Humphrey

Honors and Awards

- Certificate of Recognition*, International Association of GeoChemistry (IAGC) 2012
- NSF Post-doctoral Fellowship in Earth Sciences* 1995-1997
- Outstanding Graduate Student Instructor Award*, Univ of California, Berkeley 1994
- NASA Graduate Student Fellowship in Global Change Research* 1991-1994
- Searles Fellowship, Regents Fellowship*, University of California, Berkeley 1989,1990

Professional Memberships

American Geophysical Union (AGU)
Geochemical Society
Geological Society of America (GSA)
International Association of GeoChemistry (IAGC)

Publications

Peer-reviewed journal articles

*Student author, **Undergraduate student author, †Post-doc author

62. Anderson, RS, Rajaram, H, and **Anderson, SP** (2019): Climate driven co-evolution of weathering profiles and hillslope topography generates dramatic differences in critical zone architecture. *Hydrological Processes* 33(1): 4-19, doi: 10.1002/hyp.13307.
61. Richter, D, Billings, S, Groffman, P, Kelly, E, Lohse, K, McDowell, W, Riebe, C, Silver, W, White, T, **Anderson, SP**, Brantley, S, Brecheisen, Z, Chadwick, O, Hartnett, H, Hobbie, S, Kazanski, C,

- Markewitz, D, O'Neill, K, Schroeder, P, and Thompson, A (2018): Ideas and perspectives: Strengthening the biogeosciences in environmental research networks. *Biogeosciences* 15, 4815-4832, doi: 10.5194/gb-15-4815-2018.
60. Litaor, MI, Suding, K, **Anderson, SP**, Litus, G, and Caine, TN (2018): Alpine catena response to nitrogen deposition and its effects on the aquatic system. *Catena* 170: 108-118, doi: 10.1016/j.catena.2018.06.004.
59. *Von Voigtlander, J, Clark, MK, Zekkos, D, *Greenwood, WW, **Anderson, SP**, Anderson, RS, and Godt, JW (2018): Strong variation in weathering of layered rock maintains hillslope-scale strength under high precipitation. *Earth Surface Processes and Landforms*, 43: 1183-1194, doi: 10.1002/esp.4290.
58. Brantley, SL, McDowell, W, Dietrich, WE, White, TS, Kumar, P, **Anderson, SP**, Chorover, J, Lohse, KA, Bales, R, Richter, D, Grant, G, and Gaillardet, J (2017): Designing a network of Critical Zone Observatories to explore the living skin of the terrestrial Earth. *Earth Surface Dynamics* 5:841-860, doi: 10.5194/esurf-5-841-2017.
57. *Aguirre, A, Derry, LA, *Mills, TJ, and **Anderson, SP** (2017): Colloidal transport in the Gordon Gulch catchment of the Boulder Creek CZO and its effect on C-Q relationships for silicon. *Water Resour. Res.*, doi: 10.1002/2016WR019730.
56. Hinckley, ES, Ebel, BA, Barnes, RT, Murphy, SF, and **Anderson, SP** (2017): Critical zone properties control the fate of nitrogen during experimental rainfall in montane forests of the Colorado Front Range. *Biogeochemistry* 132 (1): 213-231, doi:10.1007/s10533-017-0299-8.
55. *Mills, TJ, **Anderson, SP**, Bern, C, *Aguirre, A, and Derry, LA (2017): Colloid mobilization and seasonal variability in a semi-arid, headwater stream. *J Environ. Qual.* 46 (1): 88-95, doi:10.2134/jeq2016.07.0268.
54. Hinckley, E-L, **Anderson, SP**, Baron, JS, Blanken, PD, Bonan, G., Bowman, WD, Elmendorf, S, Fierer, N, Fox, A, Goodman, K, Jones, K, Lombardozzi, D, Lunch, C, Neff, J, SanClements, M, Suding, K, and Wieder, W (2016): Optimizing available network resources to address questions in environmental biogeochemistry. *BioScience* XX: 1-10, doi:10.1093/biosci/biw005.
53. White, T, Brantley, S, Banwart, S, Chorover, J, Dietrich, W, Derry, L, Lohse, K, **Anderson, S**, Aufdenkampe, A, Bales, R, Kumar, P, Richter, D, and McDowell, B (2015): Chapter 2—The role of critical zone observatories in critical zone science. *In: Developments in Earth Surface Processes* 19:15-78, doi:10.1016/B978-0-444-63369-9.00002-1.
52. †Mavris, C, Furrer, G, Dahms, D, **Anderson, SP**, Blum, A, Goetze, J, Wells, A, and Egli, M (2015): Decoding potential effects of climate and vegetation change on mineral weathering in alpine soils: An experimental study in the Wind River Range (Wyoming, USA). *Geoderma* 255-256: 12-26, doi:10.1016/j.geoderma.2015.04.014.
51. *Langston, A, Tucker, GE, Anderson, RS, and **Anderson, SP** (2015): Evidence for climatic and hillslope-aspect controls on vadose zone hydrology and implications for saprolite weathering, *Earth Surface Processes and Landforms* 40:1254-1269, doi:10.1002/esp.3718.
50. Anderson, SW, **Anderson, SP**, and Anderson, RS (2015): Exhumation by debris flows in the 2013 Colorado Front Range storm, *Geology* 43 (5): 391-394, doi:10.1130/G36507.1. This paper was the subject of a *Geology* Research Focus commentary: McCoy, SW (2015): Infrequent, large-magnitude debris flows are important agents of landscape change, *Geology* 43 (5): 463-464, doi:10.1130/focus052015.1.
49. Hinckley, E-L, Barnes, RT, **Anderson, SP**, Williams, MW, and Bernasconi, S (2014): Nitrogen retention and transport differ by hillslope aspect at the rain-snow transition of the Colorado Front Range, *Journal of Geophysical Research-Biogeosciences* 119 (7): 1281-1296, doi:10.1002/2013JG002588.

48. *Gabor, RS, Eilers, KG, McKnight, DM, Fierer, N, and **Anderson, SP** (2014): From the litter layer to the saprolite: Chemical changes in water-soluble soil organic matter and their correlation to microbial community composition, *Soil Biology and Biochemistry* 68: 166-176, doi:10.1016/j.soilbio.2013.09.029.
47. **Anderson, SP**, Anderson, RS, Tucker, GE, and Dethier, DP (2013): Critical zone evolution: Climate and exhumation in the Colorado Front Range. *In* Abbot, LD and Hancock, GS, eds., *Classic Concepts and New Directions: Exploring 125 Years of GSA Discoveries in the Rocky Mountain Region: Geological Society of America, Field Guide* 33, p. 1-18, doi:10.1130/2013.0033(01).
46. Anderson, RS, **Anderson, SP**, and Tucker, GE (2013): Rock damage and regolith transport by frost: An example of climate modulation of critical zone geomorphology. *Earth Surface Processes and Landforms* 38: 299-316, doi:10.1002/esp.3330. (Publ. online 18 Oct 2012).
45. **Anderson, SP**, Anderson, RS, and Tucker, GE (2012): Landscape scale linkages in critical zone evolution. *Comptes rendus- Geoscience* 344: 586-596, doi:10.1016/j.crte.2012.10.008.
44. †Hinckley, E-L, Ebel, BA, Barnes, RT, Anderson, RS, Williams, MW, and **Anderson, SP** (2014): Aspect control of water movement on hillslopes near the rain-snow transition of the Colorado Front Range, U.S.A. *Hydrological Processes* 28: 74-85, doi:10.1002/hyp.9549. (Publ. online 17 Oct 2012.)
43. †Portillo, MC, **Anderson, SP**, and Fierer, N (2012): Temporal variability in the diversity and composition of stream bacterioplankton communities. *Environmental Microbiology* 14 (9): 2417-2428, doi:10.1111/j.1462-2920.2012.02785.x.
42. *Eilers, K, **Debenport, S, **Anderson, SP**, and Fierer, N (2012): Digging deeper to find unique microbial communities: the strong effect of depth on the structure of bacterial and archaeal communities. *Soil Biology & Biochemistry* 50: 58-65, doi:10.1016/j.soilbio.2012.03.011.
41. *Frederick, ZA, **Anderson, SP**, and Striegl, R, (2012): Annual estimates of water and solute export from 42 tributaries to the Yukon River. *Hydrological Processes* 26 (13): 1949-1961, doi: 10.1002/hyp.8255.
40. *Bartholomaeus, TC, Anderson, RS, and **Anderson, SP** (2011): Growth and collapse of the distributed subglacial hydrologic system of Kennicott Glacier, Alaska, USA, and its effects on basal motion. *J Glaciology* 57 (206): 985-1002.
39. *Befus, K.M., Sheehan, A.F., Leopold, M., **Anderson, S.P.** and Anderson, R.S. (2011): Seismic constraints on critical zone architecture, Boulder Creek watershed, Front Range, Colorado. *Vadose Zone Journal* 10: 915-927.
38. *Riggins, SG, Anderson, RS, **Anderson, SP**, and Tye, AM (2011): Solving a conundrum of a steady-state hillslope with variable soil depths and production rates, Bodmin Moor, UK. *Geomorphology*, 128: 73-84.
37. White AF, Schulz, MS, Vivit, DV, Blum, AE, Stonestrom, DA, and **Anderson, SP** (2008) Chemical weathering of a marine terrace chronosequence, Santa Cruz, California, I: Interpreting rates and controls based on soil concentration-depth profiles. *Geochimica et Cosmochimica Acta* 72: 36-68.
36. *Bartholomaeus, TC, Anderson, RS, and **Anderson, SP** (2008) Response of glacier basal motion to transient water storage. *Nature Geoscience*, 1: 33-37. (Published online: 20 December 2007)
35. **Anderson, SP**, von Blanckenburg, F, and White, AF (2007) Physical and chemical controls on the critical zone. *Elements* 3: 315-319.
34. Molnar, P.H., Anderson, R.S., and **Anderson, SP** (2007): Tectonics, fracturing of rock, and erosion. *Journal of Geophysical Research-Earth Surface*, 112, F03014, doi:10.1029/2005JF000433, 12 pages.

33. Meier, M.F., Dyurgerov, M.B., *Rick, U.K., O'Neel, S., Pfeffer, W.T., Anderson, R.S., **Anderson, SP**, and Glazovsky, A.F (2007): Small glaciers dominate eustatic sea-level rise in the 21st century. *Science* 317 (5841): 1064-1067. Originally published in *Science Express* on 19 July 2007.
32. *Ebel, B.A., Loague, K., VanderKwaak, J.E., Dietrich, W.E., Montgomery, D.R., Torres, R. and **Anderson, SP** (2007): Near-surface hydrologic response for a steep, unchanneled catchment near Coos Bay, Oregon: 2. Physics-based simulations. *American Journal of Science* 307, 709-748, doi: 10.2475/04.2007.03.
31. *Ebel, B.A., Loague, K., Dietrich, W. E., Montgomery, D. R., Torres, R., **Anderson, SP**, and Giambelluca, T. W. (2007): Near-surface hydrologic response for a steep, unchanneled catchment near Coos Bay, Oregon: 1. Sprinkling experiments. *American Journal of Science* 307, 678-708, doi: 10.2475/04.2007.02.
30. **Anderson, SP** (2007): Biogeochemistry of glacial landscape systems, *Annual Review of Earth and Planetary Sciences*, Vol. 35: 375-399.
29. Nemergut, DR, **Anderson, SP**, Cleveland, CC, Martin, AP, Miller, AE, Seimon, A, and Schmidt, SK (2007): Microbial community succession in an unvegetated, recently-deglaciated soil. *Microbial Ecology*, 53: 110-122 doi: 10.1007/s00248-006-9144-7. Published online 22 Dec 2006.
28. Walder, JS, Trabant, DC, *Cunico, M, Fountain, AG, **Anderson, SP**, Anderson, RS, **Malm, A (2006): Local response of a glacier to annual filling and drainage of an ice-marginal lake. *Journal of Glaciology* 52 (178): 440-450.
27. *Loso, MG, Anderson, RS, **Anderson, SP**, and Reimer, PJ (2006): A 1500-year record of temperature and glacial response inferred from varved Iceberg Lake, southcentral Alaska. *Quaternary Research* 66(1): 12-24.
26. Anderson, RS, Walder, JS, **Anderson, SP**, Trabant, DC, and Fountain, AG (2005): The dynamic response of Kennicott Glacier to the Hidden Creek Lake outburst flood, *Annals of Glaciology* 40: 237-242.
25. Walder, J.S., Trabant, DC, *Cunico, M, **Anderson, SP**, Anderson, RS, and Fountain, AG (2005): Fault-dominated deformation in an ice dam during annual filling and drainage of a marginal lake, *Annals of Glaciology* 40: 174-178.
24. †Skidmore, M.L., **Anderson, S.P.**, Sharp, M., Foght, J.M. and Lanoil, B.D., (2005): Comparison of microbial community compositions of two subglacial environments reveals a possible role for microbes in chemical weathering processes, *Appl. Environ. Microbiol.*, 71(11): 6986-6997.
23. *Riihimaki, CA, *MacGregor, KR, Anderson, RS, **Anderson, SP**, and *Loso, MG (2005): Sediment evacuation and glacial erosion rates at a small alpine glacier, *J. Geophys. Res.*, 110, F03003, doi:10.1029/2004JF000189, 17 pages.
22. **Anderson, SP** (2005): Glaciers show direct linkage between erosion rates and chemical weathering fluxes, *Geomorphology* 67 (1-2): 147-157.
21. *Loso, MG, Anderson, RS, **Anderson, SP** (2004): Post Little Ice Age record of coarse and fine clastic sedimentation in an Alaskan proglacial lake, *Geology* 32(12): 1065-1068.
20. Anderson, RS, **Anderson, SP**, *MacGregor, KR, Waddington, ED, *O'Neel, S, *Riihimaki, CA, and *Loso, MG (2004): Strong feedbacks between hydrology and sliding of a small alpine glacier, *J. Geophys. Res.*, 109, F03005, doi:10.1029/2004JF000120, 17 pages.
19. **Anderson, SP**, **Longacre, SA, and *Kraal, ER (2003): Patterns of water chemistry and discharge in the glacier-fed Kennicott River, Alaska: Evidence for subglacial water storage cycles, *Chemical Geology*, **202** (3-4): 297-312.

18. **Anderson, SP**, Walder, JS, Anderson, RS, *Kraal, ER, *Cunico, M., Fountain, AG, and Trabant, DC. (2003): Integrated hydrologic and hydrochemical observations of Hidden Creek Lake jökulhlaups, Kennicott Glacier, Alaska, *Journal of Geophysical Research*, 108(F1), 6003, doi:10.1029/2002JF000004, 19 pages.
17. **Anderson, SP**, Dietrich, WE, and Brimhall, GH, Jr. (2002): Weathering profiles, mass balance analysis, and rates of solute loss: Linkages between weathering and erosion in a small, steep catchment, *Geological Society of America Bulletin* 114(9): 1143-1158.
16. *Evans, MJ, Derry, LA, **Anderson, SP**, and France-Lanord, C (2001): A hydrothermal source of radiogenic Sr to Himalayan rivers, *Geology* 29(9): 803-806.
15. **Anderson, SP**, and Dietrich, WE (2001): Chemical weathering and runoff chemistry in a steep, headwater catchment. *Hydrological Processes* 15: 1791-1815.
14. *MacGregor, KR, Anderson, RS, **Anderson, SP**, and Waddington, E.D (2001): Numerical simulations of glacial-valley longitudinal profile evolution: Reply. *Geology* 29 (8): 760.
13. *MacGregor, KR, Anderson, RS, **Anderson, SP**, and Waddington, E.D (2000): Numerical simulations of glacial-valley longitudinal profile evolution. *Geology* 28 (11): 1031-1034.
12. **Anderson, SP**, Drever, JI, Frost, CD, and Holden, P (2000): Chemical weathering in the foreland of a retreating glacier. *Geochimica et Cosmochimica Acta* 64 (7): 1173-1189.
11. **Anderson, SP**, *Fernald, KH, Anderson, RS, and Humphrey, NF (1999): Physical and chemical characteristics of a spring flood event, Bench Glacier, Alaska: Evidence for water storage. *Journal of Glaciology* 45 (150): 177-189.
10. Torres, R, Dietrich, WE, Loague, K, Montgomery, DR, and **Anderson, SP** (1998): Unsaturated zone processes and the hydrologic response of a steep, unchanneled catchment. *Water Resources Research* 34 (8): 1865-1879.
9. **Anderson, SP**, Dietrich, WE, Montgomery, DR, Torres, R, Conrad, ME, and Loague, K (1997): Subsurface flow paths in a steep, unchanneled catchment. *Water Resources Research* 33 (12): 2637-2653.
8. **Anderson, SP**, Drever, JI, and Humphrey, NF (1997): Chemical weathering in glacial environments. *Geology* 25 (5): 399-402.
7. Montgomery, DR, Dietrich, WE, Torres, R, **Anderson, SP**, Heffner, JT, and Loague, K (1997): Hydrologic response of a steep unchanneled valley to natural and applied rainfall. *Water Resources Research* 33(1): 91-109.
6. **Anderson, SP**, Dietrich, WE, Torres, R, Montgomery, DR, and Loague, K (1997): Concentration-discharge relationships in a steep, unchanneled valley. *Water Resources Research* 33(1): 211-225.
5. **Anderson, SP**, and Anderson, RS (1990): Debris-flow benches: Dune contact deposits record paleo-sand dune positions in north Panamint Valley, Inyo County, California. *Geology* 18(6): 524-527.
4. Hallet, B., **Anderson, SP**, Stubbs, CW, and Gregory, EC, (1988): Surface soil displacements in sorted circles, western Spitsbergen. In Senneset, K., ed., Permafrost, Fifth International Conf. Proc. v.1: Trondheim, Norway, Tapir Publishers, p. 770-775.
3. **Anderson, SP** (1988): Upfreezing in sorted circles, western Spitsbergen. In Senneset, K., ed., Permafrost, Fifth International Conf. Proc. v.1: Trondheim, Norway, Tapir Publishers, p. 666-671.
2. **Anderson, SP** (1988): The upfreezing process: Experiments with a single clast. *Geological Society of America Bulletin* 100: 609-621.

1. Hallet, B, and **Prestrud, S** (1986): Dynamics of periglacial sorted circles in western Spitsbergen. *Quaternary Research* 26: 81-99.

Textbook

Anderson, RS, and **Anderson, SP** (2010): *Geomorphology: The Mechanics and Chemistry of Landscapes*. Cambridge University Press, 340 pp. (Choice Outstanding Academic Title, 2011. Sales: 1356 in 2010; 1514 in 2011; 435 in 2012; 522 in 2013; 356 in 2014; 545 in 2015; 268 in 2016; 358 in 2017; 313 in 2018.)

Invited commentary

Anderson, SP (2012): How deep and how steady is the Earth's surface? *Geology*, 40 (9): 863-864, doi:10.1130/focus092012.1.

Short papers/extended abstracts for conferences, peer-reviewed

[Invited talk] Anderson, SP, Hinckley, E-L, *Kelly, P, *Langston, A (2014): Variation in critical zone processes and architecture across slope aspects, *Procedia Earth and Planetary Science* 10: 28-33, doi:10.1016/j.proeps.2014.08.006. (Tenth International Symposium on Geochemistry of the Earth's Surface, Paris)

Anderson, SP, Anderson, RS, Hinckley, ES, *Kelly, P, and Blum, AE (2011): Exploring weathering and regolith transport controls on critical zone development with models and natural experiments. *Applied Geochemistry* 26: S3-S5. (Ninth International Symposium on Geochemistry of the Earth's Surface, Boulder, Colorado)

*Langston, AL, Tucker, GE, Anderson, RS, and **Anderson, SP** (2011): Exploring links between vadose zone hydrology and chemical weathering in the Boulder Creek Critical Zone Observatory. *Applied Geochemistry* 26: S70-S71. (Ninth International Symposium on Geochemistry of the Earth's Surface, Boulder, CO)

[Invited talk] Anderson, SP, Bales, RC, and Duffy, CJ (2008): Critical Zone Observatories: Building a network to advance interdisciplinary study of Earth surface processes. *Mineralogical Magazine*, 72(1): 7-10, doi:10.1180/minmag.2008.072.1.7. (Eighth International Symposium on Geochemistry of the Earth's Surface, London)

Anderson, SP (2006): Case study: Impact of mineral surface area on solute fluxes at Bench Glacier, Alaska. In Knight, P., ed., *Glacier Science and Environmental Change*, Oxford: Blackwell Publishing, p. 75-78.

Anderson, SP, Mann, DH, and Blum, AE (2004): Chemical weathering along a depositions sequence of glacial loess-derived soils in Alaska. In Wanty, R. and Seal, R. (eds.) *Eleventh International Symposium on Water-Rock Interaction, Vol. 1* Rotterdam: Balkema, p. 797-799.

Vivit, DV, Schulz, MS, White, AF, and **Anderson, SP** (2004): Cycling of Si in a marine terrace chronosequence demonstrated by pore-water Ge/Si ratios. In Wanty, R and Seal, R (eds.) *Eleventh International Symposium on Water-Rock Interaction, Vol. 1* Rotterdam: Balkema, p. 887-890.

Anderson, SP (2002): A conceptual overview of the geochemistry of glaciation. In *Abstracts Volume, Sixth International Symposium on the Geochemistry of the Earth's Surface (GES-6)*, p. 1-4.

Anderson, SP, Drever, JI, and Humphrey, NF (1996): Glacial chemical weathering regimes in relation to the continental norm. In Bottrell, S.H., ed., *Proceedings of the Fourth International Symposium on the Geochemistry of the Earth's Surface*, Leeds, University of Leeds Press, p. 529-533.

Anderson, SP, Dietrich, WE, Torres, R, Montgomery, DR, and Loague, K, (1993): A case for geochemical control of concentration-discharge relationships. *Chemical Geology* 107: 369-371. (Third International Symposium on Geochemistry of the Earth's Surface, Penn State)

Editorials, book reviews, reports

Banwart, SA, Chorover, J, Gaillardet, J, Sparks, D, White, T, **Anderson, SP**, Aufdenkampe, A, Bernasconi, S, Brantley, SL, Chadwick, O, Dietrich, WE, Duffy, C, Goldhaber, M, Lehnert, K, Nikolaidis, NP, and Ragnarsdottir, KV (2013): *Sustaining Earth's Critical Zone: Basic science and interdisciplinary solutions for global challenges*. Workshop report, University of Sheffield, 48 p, ISBN: 978-0-9576890-0-8.

- Anderson, SP** and Gislason, S (2011): Preface: Geochemistry of the Earth's Surface, *Applied Geochemistry* 26: S1-S2, doi:10.1016/j.apgeochem.2011.02.123.
- Anderson, SP** (2010): Review of "Greetings from Spitsbergen: Tourists on the Eternal Ice 1827-1914" by John T. Reilly. *Arctic, Antarctic and Alpine Research*, 42 (3): 376.
- Loso, MG, Anderson, RS, Doak, DF, and **Anderson, SP** (2007): A disappearing lake reveals the Little Ice Age history of climate and glacier response in the icefields of Wrangell-St. Elias National Park and Preserve, *Alaska Park Science*, 6 (1): 30-35.
- Brantley, SL, White, TS, White, AF, Sparks, D, Richter, D, Pregitzer, K, Derry, L, Chorover, J, Chadwick, O, April, R, **Anderson, S**, and Amundson, R. (2006): Frontiers in Exploration of the Critical Zone: Report of a workshop sponsored by the National Science Foundation (NSF), October 24-26, 2005, Newark, DE, 30p.
- Anderson, SP**, Blum, J, Brantley, SL, Chadwick, O, Chorover, J, Derry, LA, Drever, JI, Hering, JG, Kirchner, JW, Kump, LR, Richter, D, and White, AF (2004): Proposed initiative would study Earth's weathering engine, *Eos Transactions, AGU*, 85 (28): 265,269. (Note: author list was alphabetized by the publisher; I contributed but did not lead the writing of this report.)
- Anderson, SP**, and Blum, AE (2003): (Editorial) Controls on chemical weathering: small- and large-scale perspectives, *Chemical Geology*, **202** (3-4): 191-193.
- Anderson, SP** (2003): Glacier behavior linked to seasonal hydrology, *Witness the Arctic*, 10 (1): 17.
- Jaeger, J, Hallet, B, Pavlis, T, Sauber, J, Lawson, D, Milliman, J, Powell, R, **Anderson, SP**, Anderson, R (2001): Orogenic and glacial research in pristine southern Alaska. *Eos, Transactions, AGU* **82** (19): 213-216.
- Anderson, SP** (1999): Review of "Soils and Geomorphology", third edition by P. Birkeland, *Eos Transactions*. **80** (44): 524.

Grant funding

Active grants

- NSF-EAR-1331828 Boulder Creek CZO II: Evolution, Form, Function, and the Future of the Critical Zone. PI: SP Anderson, Co-PI: RS Anderson, NP Molotch, H Rajaram, GE Tucker. \$4,900,000. 10/1/13-9/30/19.
- NSF-EAR 1818965: Supplement to Boulder Creek Critical Zone Observatory II: Evolution, Form, Function, and Future of the Critical Zone (*supports National Cross-CZO post-doc, 2nd year*). PI: SP Anderson, Co-PI: RS Anderson, NP Molotch, H Rajaram, GE Tucker. \$136,105. 12/1/17-9/30/18.
- NSF-EAR-1822062: Topographic response to the transition from snowmelt- to rainfall-triggered extremes. PI: Matt Rossi, Co-PI: RS Anderson, SP Anderson, GE Tucker. \$404,990. 3/1/18-2/28/20.
- NSF-EAR-1840758: Supplement to Boulder Creek Critical Zone Observatory II: Evolution, Form, Function, and Future of the Critical Zone (*supports graduate students, post-docs, staff, and monitoring*). PI: SP Anderson. \$670,423. 4/1/19-5/30/20.
- NSF-EAR-1928430: Supplement to Boulder Creek CZO II: Evolution, Form, Function, and Future of the Critical Zone. PI: SP Anderson. \$37,482. (*Supports 1 current graduate student to intern with the USGS for 3 months via the Non-Academic Research Internships for Graduate Students (INTERN) (NSF 18-102) program.*)

Invited talks (Recent)

- 9 Jan 2017 University of Potsdam, Germany, Earth Surface Processes speaker series, "*The critical zone: Geo-bio-hydro interactions that shape the Earth's surface*".
- 2 Nov 2016 University of California, Santa Barbara, Department of Earth Sciences Crowell Lecturer, "*In the wake of a knick zone: From block fall to debris flows*".

- 14 Apr 2016 Montana State University, Department of Earth Sciences colloquium, “*The long and the short of it: Frost cracking, debris flows, and critical zone architecture*”.
- 4 Mar 2016 University of Iceland, Faculty of Earth Sciences, Reykjavik, “*Weathering in glaciated landscapes*”.
- 20 Nov 2015 University of Wisconsin-Madison, Department of Geosciences, Weeks Lecture Series, “*The long and the short of it: Frost cracking, debris flows, and critical zone architecture*”.
- 23 Jun 2015 University of Wollongong, Australia, GeoQuest seminar, “*Variations in critical zone processes and architecture, Colorado Front Range, USA*”.
- 14 Oct 2014 Rocky Mountain Hydrologic Research Center, 69th Annual meeting, Wild Basin lodge, Allenspark, CO, “*Exhumation by debris flows in the 2013 Front Range storm: A role in landscape response to base-level lowering*” (with Bob Anderson), and “*Groundwater in the 2013 storm*”.
- 8 Oct 2014 University of Colorado Boulder School of the Environment and Sustainability 2014-15 Colloquium Series, “*The surprisingly deep history of Boulder’s iconic landscape*”.

Teaching

Environmental Systems 2: **Landscapes and Water**, Geog 1011

Principles of Geomorphology, Geog/Geol 4241

Glaciers and Permafrost, Geog 4261

Graduate seminars on extreme events, weathering systems, and critical zone science.

Postdoctoral Researchers Supervised

Matt Rossi, 2016—present, EarthLab (CU Grand Challenge project)/Boulder Creek CZO post-doc, co-supervised with Greg Tucker and Bob Anderson.

Christian Mavris, 2012-13, Visiting Swiss National Science Foundation Post-doctoral Fellow, Global warming induced vegetation changes and their effects on mineral weathering in a cold-dry and alpine environment (Wind River Range). (Now post-doc at Natural History Museum, London)

Eve-Lyn Hinckley, 2009-11, NSF Earth Sciences Post-doctoral Fellow, An Integrated Approach to Study the Interactions between Hydrologic Response and Nitrogen Biogeochemistry (Now Assistant Prof. University of Colorado, Boulder)

Daniel Bain, 2004-6, National Research Council Post-doctoral Fellow, (co-advised with Tom Bullen, USGS), Hydrology and hydrochemistry of the Santa Cruz marine terraces. (Now Associate Prof. University of Pittsburgh)

Graduate Theses Supervised

Masters degrees

Noah (Claire) Hoffman, in progress, Geography. (B.A. Geology and B.A. Biology, Oberlin College, 2015).

Patrick Kelly, 2012, *Subsurface evolution: Characterizing physical and geochemical weathering in bedrock of Gordon Gulch, Boulder Creek Critical Zone Observatory*, M.A. thesis, Dept. of Geography, University of Colorado. (B.S., Geology, Colorado State University, 2009). Now at US EPA, San Francisco, CA.

Zanden Frederick, 2008, *Water and solute export from the Yukon River and its tributaries*, M.A. thesis, Dept. of Geography, University of Colorado, 77 pp. (B.S., Geology, Western Washington University, 2000). Now in Anchorage, Alaska.

Cynthia Cacy, 2006, *Chemical weathering in the loess-mantled landscape of the Matanuska Valley, Alaska*, M.S. thesis, Dept. of Environmental Studies, University of Colorado, 101 pp. (B.S. Chemical Engineering, Rensselaer Polytechnic Institute, 2004). Hired by hydrologic consulting firm S.S. Papadopoulos & Associates, Boulder.

Erin Kraal, 2001, *The 1999 and 2000 Hidden Creek Lake outburst floods on the Kennicott Glacier, Alaska*, M.S. thesis, Dept. of Earth Sciences, University of California, Santa Cruz, 119 pp. (B.S. Geology, Washington and Lee University, 1999) Now faculty, Kutztown University, PA.

Doctor of Philosophy

Brittany Selander, in progress, Geography. (BS, Earth Science, UC Santa Cruz, 2011; MS, Geology, San Jose State University, 2015)

- Taylor Joseph Mills, 2016, Geography. *Water chemistry under a changing hydrologic regime: Investigations into the interplay between hydrology and water-quality in arid and semi-arid watersheds in Colorado, USA*. (BA, Environmental Studies, CU, 2008; MS, Colorado School of Mines, 2010). Now at NCAR, Boulder, CO.
- Susan G. Riggins, 2010, Geography. *The production and evolution of mobile regolith: Modeled soil production and measured chemical weathering*. (B.S. with distinction, Geology, University of Illinois, Urbana-Champaign, 2000; M.S. Geological Sciences, University of Colorado, 2003.) Awarded CZEN International Scholars Fellowship, 2006-2007. Lecturer, Geological and Environmental Sciences, California State University, Chico.

Supervision of Professional Staff

Classified Staff

Wendy Roth, Lab Coordinator II, Manager of the INSTAAR Sedimentology Laboratory.

Professional Research Assistants

Clayton Jensen, Lab manager for the Boulder Creek Critical Zone Observatory..

Eric Parrish, Graphics and data specialist for the Boulder Creek Critical Zone Observatory..

Dillon Ragar, Field manager for the Boulder Creek Critical Zone Observatory.

Professional Service (Selected)

- Search Committee external expert for new professorship in Soil Weathering and Development. Faculty of Geosciences and Environment, University of Lausanne, Switzerland, 2017-2018.
- Reviewer for student awards, Quaternary Geology and Geomorphology division of the Geological Society of America, 2016.
- Niwot Ridge Long Term Ecological Research (LTER) site Science Advisory Board member, 2015-
 Convened *Salon on the Deep Critical Zone, June 2015*. Four-day workshop with 18 participants to synthesize data and understanding from 11 sites.
- Kirk Bryan Field Trip leader, Geological Society of America Annual Meeting, October 30, 2013.
 Lead largest field trip (75 participants) associated with the 2013 GSA Annual Meeting. Also convened a theme session during the meeting. Both on the topic of “*Critical zone evolution: Climate and exhumation in the Colorado Front Range*”.
- QWARTS (Quantifying WeAthering RaTes for Sustainable Forestry) Science Advisory Board member, 2013-2018. Swedish joint program between SLU (Swedish Agricultural University) and Uppsala University
- SoilTrEC (Soil Transformations in European Catchments) Science Advisory Board member, 2010-2015.
 SoilTrEC was a €7M European Commission project based in University of Sheffield.
- AGU Earth and Planetary Surface Processes focus group Executive Committee, 2009-2018
Convener of “The Value of CZ Science in Service of Society” and “Tree, water, regolith and rock: The role of roots and plant hydraulics in CZ processes”, 2018; “The Architecture and Workings of the Critical Zone”, and Union session “The Critical Zone: Revealing the Structure, Function, and Evolution of Earth’s Living Skin”, 2016; “The Deep Critical Zone and the Inception of Surface Processes”, 2012; “Critical Zone Processes”, 2009.
Awards committee (GK Gilbert Award, Luna Leopold Award): 2016, 2018
- Scientific Program Committee, Twelfth International Symposium on the Geochemistry of the Earth’s Surface (GES-12), Zurich, Switzerland, 2020; Tenth International Symposium on Geochemistry of the Earth’s Surface (GES-10), Paris, France, 2014.
- Secretary General, Ninth International Symposium on Geochemistry of the Earth’s Surface (GES-9), Boulder, Colorado, June 2011. Hosted this triennial conference (125 participants), sponsored by the IAGC.
- Steering committee, Critical Zone Exploration Network (CZEN), 2003-2007
- AGU Hydrology Section Langbein Lecture Committee, 2005-2008
 Selects the Walter Langbein Lecturer (given at the AGU Fall Meeting) for their lifetime contributions to hydrology and/or service promoting cooperation in hydrologic research.
- AGU Hydrology Section Sediment and Landscape Dynamics Technical Committee, 1996-2007 (Chair, 2002-2004)
 Convener of “Geomorphology of Mountainous Regions”, 1998; “Hillslope and Fluvial Posters”, 1999; “Geomorphology”, 2000; “Glacial Sediment Systems from Source to Sink”, 2001; “Linkages between physical erosion and chemical weathering”, 2004; “Glaciers and Permafrost”, 2007
- AGU Hydrology Section Outstanding Student Paper Award Committee, 1997-1999
 Coordinated judging of student papers for 4 AGU meetings.

Reviewing and Editorial Service

NSF review panel member, Biocomplexity; Geomorphology and Land Use Dynamics.
Reviewer for U.S. National Science Foundation, U.K. Natural Environmental Research Council, Swiss National Research Council, Swiss National Science Foundation, German Helmholtz Association, American Chemical Society Petroleum Research Fund, Icelandic Research Fund, Israel Science Foundation, and National Geographic Society Research fund.
Reviewer for National Research Council reports: “Landscapes on the Edge” (2010), “Challenges and Opportunities in Hydrologic Sciences” (2011)
The Holocene Editorial Advisory Board member, 2017-
Earth Surface Processes and Landforms International Advisory Board member, 2014-2019.
Guest editor, *Hydrological Processes* Special Issue on “Water in the Critical Zone”, with Ying Fan Reinfelder (Rutgers) and Gordon Grant (USFS/OSU).
Guest Editor, *Applied Geochemistry* Vol. 26 Supplement, 2011. Issue contained 111 abstracts and extended abstracts from the 9th International Symposium on Geochemistry of the Earth’s Surface.
Guest Editor, *Chemical Geology* December 2003 issue on “Controls on Chemical Weathering”
Co-guest editor, Alex Blum (USGS).
Associate Editor, *Arctic, Antarctic, and Alpine Research*, 2007-2011
Editor, *Arctic, Antarctic, and Alpine Research*, 2004-2006.
Collection advisor, AGU Editor's Choice: Surface Processes virtual journal, 2002-2007.
Associate Editor, *Journal of Geophysical Research- Earth Surface*, 2002-2006.

University Service (Selected)

Chair, Geography Department Colloquium Committee, 2017-2018.
Internal reviewer for the Department of Germanic and Slavic Languages and Literature, 2015-2016.
Arts and Science Council ad hoc Core Revision Committee, 2015-16
Geography Dept. Undergraduate Committee member, 2004-05, 2014-16.
Environmental Science Working Group, CU School of the Environment and Sustainability, 2014-15.
Graduate School Research Review Board, 2013-16.
Associate Chair, Director of Graduate Studies, and Chair of Graduate Admissions and Awards, Dept. of Geography, 2010-2011, 2012-13.
Graduate School Executive Advisory Council, 2010-11, 2012-13.
Geography Dept. Personnel Committee member, 2008-10.
Geography Dept. Colloquium Committee member, 2005-08, 2013-14.
Supervisor for INSTAAR Sediment laboratory classified staff member, Nov 2003-present.
Mountain Research Station Executive Committee member, 2006-present.
INSTAAR Planning Committee for Scientific Advisory Committee visit, 2006-07.
LEAP: Introductory Leadership Workshop for Junior Faculty, summer 2005.
INSTAAR ad hoc Mountain Research Station Implementation Committee, June-November 2004.
INSTAAR Executive committee member, 2003-04.

Outreach (Selected)

K-12 community: Science expert on field trip with K-12 Professional Development class on Mountain Research Experience, Niwot Ridge, June 27, 2018.
Scientific community: Hosted delegation of 15 scientists from Chinese Geological Survey to the Boulder Creek Critical Zone Observatory, Nov 6-10, 2017.
Scientific community: Hosted delegation of 8 scientists from Kangwon National University, South Korea to the Boulder Creek Critical Zone Observatory, Jan 27-30, 2016.
Undergraduate students: Led University of Nebraska, Omaha geoscience students on a field trip to Boulder Creek CZO, May 17, 2016. (20 undergraduate students and 4 faculty).
Undergraduate students: Featured in a virtual field trip video supplement to *McKnight's Physical Geography: A Landscape Appreciation* by Darryl Hess (Pearson). The 9-minute video, titled “The Critical Zone at

Boulder Creek”, is one of 20 virtual field trip videos accessible to students who purchase the textbook.

General public: Presentation followed by Q&A in the One Year Later: Boulder County Flood Seminar Series. “Flood landscape: The physical geography of the Front Range and the 2013 storm”, Sept 15, 2014, Lyons Middle/Senior High School.

General public: Radio interview with Maeve Conran, KGNU, for the “Flood Show”. Interviewed 4/1/14, broadcast 4/6/14. Discussed the September 2013 storm produced landslides and what may happen in spring 2014.

Undergraduate students and General public: Advised “Human Glacier Project” movement piece by Maren Waldman, with Beth Osnes’ movement class. Performed on April 1, 2013 at Macky Auditorium, before James Balog’s The Art of Chasing Ice performance. See: <http://www.youtube.com/watch?v=lsx5ECGK-Ow&feature=youtu.be> Taught dancers about glacier dynamics and mass balance, so that their movement piece incorporated elements of scientific understanding of glaciology.

Early career scientists: National Association of Geoscience Teachers (NAGT) On the Cutting Edge-Preparing for an Academic Career in the Geosciences workshop for graduate students and post-doctoral fellows. Presented and led session on research, teaching, careers and career paths (July 7, 2013).

Public agency: Presentation “Boulder Creek CZO: Project goals and work in Betasso Open Space” given to Boulder County Parks and Open Space staff (rangers, managers), March 12, 2013.

K-12 and graduate students: Boulder Creek CZO project partners with Science Discovery to bring graduate students and post-docs into K-12 teaching. 2009-2011: brought environmental science to 5th graders through the Outdoor Classroom program (~90 kids/year) and to middle school kids through Summer Camp (~25 kids per year). 2011-2014: Science Explorers and STEM Workshops, Classroom presentations, Teacher Professional Development workshops, Summer and After school programs have reached 3678 learners, 366 K-12 teachers, and 468 adults and chaperones.