

CURRICULUM VITÆ
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EDUCATION

Post-doctoral experience (May 2012-November 2010)

University of Montana, Advised by Cory C. Cleveland.

Ph.D. in Ecology (August 2002-May 2008)

University of Colorado at Boulder, Department of Ecology & Evolutionary Biology and Institute of Arctic & Alpine Research (INSTAAR), Boulder, CO. Advised by Alan R. Townsend.

B.A. in Organic Chemistry (August 1993-May 1997)

Colgate University, Department of Chemistry, Hamilton, NY. Graduated *magna cum laude*. Advised by David A. Modarelli.

Courses Outside My Universities:

- CO₂ Flux Methods course led by Drs. Russ Monson, Dave Moore & Paul Stoy, Niwot Ridge Research Station, July 2012.
- Stable Isotopes in Ecology Course, led by Dr. Jim Ehleringer, University of Utah, June 2005.
- Organization for Tropical Studies (OTS) Tropical Ecology Program, Costa Rica, January - March 2003.
- NSF Environmental Geology and Environmental Philosophy Internship, Southwest Earth Studies Group, Durango, CO, May - August 1997.

RESEARCH INTERESTS

My research interests are centered within the fields of biogeochemistry and ecosystem ecology and my work explores how terrestrial ecosystems respond to a host of global changes. Currently, I have research sites in Utah, New Mexico, Arizona, Hawai'i, and Puerto Rico. While my study sites and the methods I use are diverse, with each of my projects I strive to determine the dynamic controls over fundamental ecosystem processes, with the ultimate goal of providing information that will help maintain the desirable features of Earth's ecosystems in a world that is rapidly changing.

HONORS & FELLOWSHIPS

Awardee, **Presidential Early Career Award for Scientists and Engineers**

(**PECASE**). Awarded by President Obama: Highest honor bestowed by the U.S. government on scientists and engineers in the early stages of their research careers in recognition of exceptional scientific innovation and service to society. October 2011.

Recipient, **Star Award**. Received for outstanding work with the Department of the Interior. October 2010.

Awardee, **Graduate Student Research and Creative Works Award**. University of

HONORS & FELLOWSHIPS (Cont.)

- Colorado at Boulder. One of two graduating Ph.D. students from across the University whose dissertation was selected by faculty members from all disciplines as representing outstanding research and creative work. May 2008.
- Fellow, **USGS Student Career Experience Program (SCEP)**. Supported in creating a research project to model how soil gas fluxes in dryland ecosystems will vary under altered climate regimes. June-August of 2006 & 2007.
- Awardee, **Student Policy Award**, Ecological Society of America (ESA). Graduate student chosen and funded by ESA to meet with members of Congress regarding national scientific funding. September 2006.
- Selected Participant, **AAAS Program for Excellence in Science**. Nominated by the University of Colorado Vice Chancellor of Research to participate in a program rewarding praiseworthy graduate students working in the life sciences. August 2006.
- Fellow, **NSF Graduate Research Fellowship**. Awarded April 2003; deferred until September 2005-May 2008.
- Fellow, **NSF IGERT Fellowship**, Carbon Climate and Society Initiative (CCSI). August 2003-August 2005.
- Selected Full Member, **Sigma Xi Scientific Research Society**, Fall 2003-Present.
- Recipient, **Star Award**, received for outstanding work with the Department of the Interior. May 2000.
- Fellow, **Wolk Foundation**, fellowship for promising student research. Summer 1996.
- Recipient, **Lawrence Award**, awarded to one student annually for superior performance in organic chemistry. April 1996.
- Selected Member, **Phi Eta Sigma University Honor Society**, chosen for academic excellence. April 1994-May 1997.
- Selected Board Member, **Phi Eta Sigma Aid Committee**, elected for superior research to a board that selected student grant applications for funding. September 1995-May 1997.
- Nominee, **Barry Goldwater Award**, nationally nominated by Colgate University for academic distinction. November 1994.

PUBLICATIONS

- Darrouzet-Nardi, A, **SC Reed**, EE Grote, J Belnap (2015). Observations of net soil exchange of CO₂ in a dryland show experimental warming increases carbon losses in biocrust soils. *Biogeochemistry*.
- Smith, WK, **SC Reed**, C Cleveland, AP Ballantyne, WRL Anderegg, WR Wieder, YY Liu, SW Running (In Press) Large divergence of satellite and Earth system model estimates of global terrestrial CO₂ fertilization. *Nature Climate Change*.
- Metcalf et al. (In Press) Terrestrial mammalian decomposition proceeds by universal rules of microbial assembly and metabolic function. *Science*.
- Steven, B, TA McHugh, **SC Reed** (In Press). The Response of Arid Soil Ecosystems to Climate Change. In: (Ed: Steven, B) Life in Extreme Environments: The Biology of Arid Soils.
- Reed, SC**, FT Maestre, R Ochoa-Hueso, CR Kuske, A Darrouzet-Nardi, M Oliver, B Darby, LG Sancho, RL Sinsabaugh, J Belnap (In Press) Biocrusts in the Context of

PUBLICATIONS (Cont.)

Global Change. In: Belnap, J, O Lange. Biological Soil Crusts: Structure, Function, and Management.

- Steven, B, CR Kuske, **SC Reed**, J Belnap (2015) Climate change and physical disturbance result in distinct biological soil crust communities. *Applied and Environmental Microbiology*. 81: 7448-7459.
- Reed, SC**, X Yang, PE Thornton (2015) Urgent need for warming experiments in tropical forests. *New Phytologist*. 208: 324-329.
- Ferrenberg, S, **SC Reed**, J, Belnap (2015) Climate change and physical disturbance cause similar community shifts in biological soil crusts. *Proceedings of the National Academy of Sciences*. 112: 12116-12121.
- Cavaleri, MA, **SC Reed**, WK Smith, TE Wood (2015) Urgent need for warming experiments in tropical forests. *Global Change Biology*. 21: 2111-2121.
- Wertin, T, **SC Reed**, J Belnap (2015). C₃ and C₄ plant responses to increased temperatures and altered monsoonal precipitation in a cool desert on the Colorado Plateau, USA. *Oecologia* 177: 997-1013.
- McHugh, T, EM Morrissey, **SC Reed**, BA Hungate, E Schwartz (2015). Water from air: an overlooked source of moisture in arid and semiarid regions. *Scientific Reports* 5: 13767.
- Lü, XT, **SC Reed**, Q Yu, XG Han (2015) Nutrient resorption helps drive intra-specific coupling of foliar nitrogen and phosphorus under nutrient-enriched conditions. *Plant and Soil*: 1-10: doi:10.1007/s11104-015-2642-y.
- Hiltbrunner, E, R Aerts, T Bühlmann, K Huss-Danell, B Magnusson, DD Myrold, **SC Reed**, BD Sigurdsson, C Körner (2014) Ecological consequences of the expansion of N₂-fixing plants into cold biomes. *Oecologia* 176: 11-24.
- Sullivan, BW, WK Smith, AR Townsend, MK Nasto, **SC Reed**, RL Chazdon, CC Cleveland (2014) Spatially robust estimates of biological nitrogen fixation imply substantial human alteration of the tropical nitrogen cycle. *Proceedings of the National Academy of Sciences* doi:10.1073/pnas.1320646111.
- Sullivan, BW, S Alvarez-Clare, SC Castle, S Porder, **SC Reed**, L Schreeg, AR Townsend, CC Cleveland (2014) Assessing nutrient limitation in complex forested ecosystems: alternatives to large-scale fertilization experiments. *Ecology* 95: 668-681.
- Cleveland, CC, **SC Reed**, AB Keller, DR Nemergut, SP O'Neill, R Ostertag, PM Vitousek (2014) Litter quality versus soil microbial community controls over decomposition: a quantitative analysis. *Oecologia* 110:12733-12737.
- Smith, WK, CC Cleveland, **SC Reed**, SW Running (2013) Agricultural conversion without external water and nutrient inputs reduces terrestrial vegetation productivity. *Geophysical Research Letters* 10.1002/2013GL058857.
- Cleveland, CC, BZ Houlton, WK Smith, AR Marklein, **SC Reed**, SJ Del Grosso, SW Running (2013) Patterns of new versus recycled primary production in the terrestrial biosphere. *Proceedings of the National Academy of Sciences* 110:12733-12737.
- Reed, SC**, AR Townsend, CC Cleveland (2013) Relationships between phosphorus, molybdenum and free-living nitrogen fixation in tropical rain forests: Results from observational and experimental analyses. *Biogeochemistry: Synthesis & Emerging Ideas* Section 114:1-13.
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PUBLICATIONS (Cont.)

- Vitousek, PM, DNL Menge, **SC Reed**, CC Cleveland (2013) Biological nitrogen fixation: rates, patterns, and ecological controls in terrestrial ecosystems. *Philosophical Transactions of the Royal Society B*. 368: 20130119.
- Lu, X-T, **SC Reed**, Q Yu, NP He, ZW Wang, XG Han (2013) Convergent responses of nitrogen and phosphorus resorption to nitrogen inputs in a semi-arid grassland. *Global Change Biology* 19:2775-2784.
- Keville, MP, **SC Reed**, CC Cleveland (2013) Nitrogen cycling responses to mountain pine beetle disturbance in a high elevation Whitebark Pine ecosystem. *PLoS One* 8: e65004. doi:10.1371/journal.pone.0065004.
- Zelikova, TJ, R Hufbauer, **SC Reed**, T Wertin, C Fetting, J Belnap. (2013) Eco-evolutionary responses of *Bromus tectorum* to climate change: Implications for biological invasions. *Ecology & Evolution* 3:1374-1387.
- Keller, AB, **SC Reed**, AR Townsend, CC Cleveland (2013) Effects of canopy tree species on belowground biogeochemistry in a lowland wet tropical forest. *Soil Biology & Biochemistry* 58: 61-69.
- Wickings, K, AS Grandy, **SC Reed**, CC Cleveland (2012) The origin of litter chemical complexity during decomposition. *Ecology Letters* 15: 1180-1188.
- Reed, SC**, AR Townsend, CC Cleveland, EA Davidson (2012). Stoichiometric patterns in foliar nutrient resorption across multiple scales. *New Phytologist* 196: 173-180.
- Reed, SC**, KK Coe, JP Sparks, DC Housman, TJ Zelikova, J Belnap (2012) Increased precipitation results in rapid moss mortality and altered fertility in a dryland ecosystem. *Nature Climate Change* 2:752-755.
- Wood, TE, MA Cavaleri, **SC Reed** (2012) Tropical forest carbon balance in a warmer world: a critical review spanning microbial- to ecosystem-scale processes. *Biological Reviews* 87: 912-927.
- Reed, SC**, T. Wood & M. Cavaleri (2012) Tropical forests in a warming world. *New Phytologist* 193: 27-29.
- Wertin, TM, SL Phillips, **SC Reed**, J Belnap (2012) Elevated CO₂ did not mitigate the effect of a short-term drought on biological soil crusts. *Biology & Fertility of Soils* 48: 797-805.
- Smith, WK, CC Cleveland, **SC Reed**, NL Miller, SW Running (2012) Bioenergy potential of the United States constrained by satellite observations and existing productivity. *Environmental Science & Technology* 46: 3536-3544.
- Reed, SC**, CC Cleveland, AR Townsend (2011). Functional ecology of free-living nitrogen fixation: a contemporary review. *Annual Review for Ecology and Systematics* 42: 489-512.
- Reed, SC**, PM Vitousek, CC Cleveland (2011) Are patterns in nutrient limitation belowground consistent with those aboveground: Results from a 4 million year chronosequence. *Biogeochemistry* 106: 323-336.
- Cleveland, CC, AR Townsend, P Taylor, MMC Bustamante, G Chuyong, P Grierson, K Harms, B Houlton, A Marklein, W Parton, S Porder, **SC Reed**, et al. (2011) Relationships among net primary productivity, nutrients and climate in tropical rain forests: A pan-tropical analysis. *Ecology Letters* 14: 939-947.
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PUBLICATIONS (Cont.)

- Schmidt SK, CC Cleveland, DR Nemergut, **SC Reed**, AJ King, P Sowell (2011) Estimating phosphorus availability for microbial growth in an emerging landscape. *Geoderma* 163: 135-140.
- Wickings, K, AS Grandy, **SC Reed**, CC Cleveland (2011) Management intensity alters decomposition via biological pathways. *Biogeochemistry* 104: 365-379.
- Reed, SC**, AR Townsend, PG Taylor, CC Cleveland. (2011) Phosphorus Cycling in Tropical Forests Growing on Highly-Weathered Soils. In: (Buneman EK, A Oberson, E Forssard) *Phosphorus In Action—Biological Processes in Soil Phosphorus Cycling*. Springer Publishing Co. vol. 26, pp. 339-369.
- Cleveland, CC, WR Wieder, **SC Reed**, AR Townsend (2010) Experimental drought in a wet tropical forest increases soil carbon dioxide losses to the atmosphere. *Ecology* 91: 2313-2323.
- Reed, SC**, CC Cleveland, DR Nemergut, SK Schmidt & AR Townsend (2010) *Scaling from molecules to ecosystems: Exploring controls over free-living nitrogen fixation in terrestrial systems*. VDM Publishers, Saarbrücken Germany.
- Reed, SC**, AR Townsend, CC Cleveland, DR Nemergut (2010) Microbial community shifts influence patterns in tropical forest nitrogen fixation. *Oecologia* 164: 521-531.
- Cleveland, CC, BZ Houlton, C Neill, **SC Reed**, AR Townsend, YP Wang (2010) Using indirect methods to constrain symbiotic nitrogen fixation rates: A case study from an Amazonian rain forest. *Biogeochemistry* 99: 1-13.
- Sattin SR, CC Cleveland, E Hood, **SC Reed**, AJ King, MS Robeson, NL Ascarrunz, DR Nemergut (2009) Functional shifts in perhumid, recently-deglaciated soils do not correlate with shifts in soil bacterial community composition. *The Journal of Microbiology* 47: 673-681.
- Costello, EK, SRP Halloy, **SC Reed**, P Sowell, SK Schmidt (2009) Fumarole-supported islands of biodiversity within a hyper-arid, high-elevation landscape on Socompa Volcano, Puna de Atacama, Andes. *Applied & Environmental Microbiology* 75: 735-747.
- Freeman, KR, MY Pescador, **SC Reed**, EK Costello, MS Robeson, SK Schmidt (2009) Soil CO₂ flux and photoautotrophic community composition in high-elevation, 'barren' soil. *Environmental Microbiology* 11: 674-686.
- Schmidt, SK, **SC Reed**, DR Nemergut, AS Grandy, CC Cleveland, MN Weintraub, AW Hill, EK Costello, AF Meyer, AM Martin, JC Neff (2008) The earliest stages of primary succession in high-elevation (5000 meters above sea-level), recently deglaciated soils. *Proceedings of the Royal Society B: Biological Sciences* 275: 2793-2802.
- Reed, SC**, CC Cleveland, AR Townsend (2008) Tree species control rates of free-living nitrogen fixation in a tropical rain forest. *Ecology* 89: 2924-2934.
- Reed, SC**, CC Cleveland, AR Townsend (2007) Controls over leaf litter and soil nitrogen fixation in two lowland tropical rain forests. *Biotropica* 39: 585-592.
- Schmidt, SK, EK Costello, DR Nemergut, CC Cleveland, **SC Reed**, MN Weintraub, AF Meyer, AM Martin (2007) Microbial turnover and seasonal succession drive biogeochemical cycles in the alpine. *Ecology* 88: 1379-1385.
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PUBLICATIONS (Cont.)

- Reed, SC**, TR Seastedt, CM Mann, KN Suding, AR Townsend (2007) Phosphorus fertilization stimulates nitrogen fixation and increases inorganic nitrogen concentrations in a restored prairie. *Applied Soil Ecology* 36: 238-242.
- Cleveland, CC, **SC Reed**, AR Townsend (2006) Nutrient regulation of organic matter decomposition in a tropical rain forest. *Ecology* 87: 492-503.
- Bowker, MA, **SC Reed**, J Belnap, SL Phillips (2002) Temporal variation in community composition, pigmentation, and *Fv/Fm* in desert cyanobacterial soil crusts. *Microbial Ecology* 43: 13-25.
- Reed, SC**, GJ Capitosti, Z Zhu & DA Modarelli (2001) Photochemical generation and matrix-isolation detection of dimethylvinylidene. *Journal of Organic Chemistry* 66: 287-291.
- Reed, SC**, DA Modarelli (1996) Conformational effects on the excited state 1,2-hydrogen migration in alkyldiazomethanes. *Tetrahedron Letters* 37: 7209-7212.

GRANTS

- Department of Energy**, Climate and Environmental Sciences Division. Effects of warming on tropical forest carbon cycling: investigating temperature regulation of key tropical tree and soil processes. Co-PIs: M. Cavaleri and T. Wood. \$960,000 over 3 years.
- NPS-Air Resources Division**. Assessment of how nitrogen deposition directly and indirectly affects dryland community composition (plants and soils), gaseous and dissolved nitrogen losses, exotic plant success, and fire regimes. Co-PIs: M. Weintraub, T. Crews, L. Floyd-Hanna, J. Belnap. Awarded April 2014. \$69,874 for 1 year.
- Natural Resources Preservation Program**. Research exploring the relationships between tree mortality, native plant establishment, biological soil crusts and soil stability in Bandelier National Monument. Co-PIs: M. Bowker, M. Duniway, C. Allen, B. Jacobs. Awarded June 2013. \$232,016 for 3 years.
- Mesa Verde NPS**. Unsign a biogeochemical lens to assess the factors that determine exotic invasion success in Mesa Verde National Park. Awarded June 2013. Co-PI: L. Floyd-Hanna. \$4,971 for 1 year.
- Department of Energy**, Climate and Environmental Sciences Division. Dryland feedbacks to future climate change: how species mortality and replacement will affect coupled biogeochemical cycles and energy balance. Co-PIs: J. Belnap and T. Painter. \$1,049,357 over 3 years.
- USGS-SBSC Nitrogen deposition affects in drylands**. This project uses a set of existing nitrogen deposition plots to explore how increased anthropogenic nitrogen inputs are affecting the Southwest. Co-PI: M. Weintraub. Awarded May 2013. \$10,000.
- US Forest Service**, Beginning the world's first tropical forest warming experiment in Puerto Rico. Co-PIs: M. Cavaleri and T. Wood. \$224,600 over 3 years.
- Department of Energy**, Climate and Environmental Sciences Division. Supplemental funds to allow for research 'wrapping-up' the existing DOE-funded climate change experiment on the Colorado Plateau. Co-PI: J. Belnap. \$224,600 for 1 year.

GRANTS (Cont.)

Department of Defense Strategic Environmental Research and

Development Program (SERDP). Research attempting to achieve dryland restoration through the deployment of enhanced biocrusts with the goals of improving soil stability, fertility and native plant recruitment. Co-PIs: N. Barger, M. Bowker, J. Belnap, M. Duniway, F. Garcia-Pichel. Awarded August 2012. *\$2.3million over 5 years* (USGS portion of budget is \$737,552).

John Wesley Powell Center for Analysis and Synthesis. Leading a series of workshops with the goal of bringing modelers and empiricists together to assess and improve models that predict climate change, with a focus on the effects of increasing temperatures on tropical forest carbon balance. Co-PIs: M. Cavaleri, T. Wood. Awarded August 2012. *\$112,858* over two years for workshop travel and graduate student/post-doctoral salary.

USGS-SBSC Nitrogen and water in bedrock. Research to explore if the nitrogen and water stored within bedrock is fueling plant growth and maintenance in dryland ecosystems. Co-PI: Mike Duniway. Awarded April 2012: *\$10,000* for 1 year.

Mendenhall USGS. Co-PI on a proposal that has received a post-doctoral fellow (Dr. Seth Munson) to use long-term datasets and modeling to explore how climate change affects plant community composition on the Colorado Plateau. Lead-PI: J. Belnap; Co-PIs: M. Miller, R. Webb, M. Dettinger, R. Reynolds, G. Okin, J. Herrick. Selected October 2011. Funding is *\$224,000* over 2 years (*\$189,000* covering the post-doctoral fellow's salary and benefits).

USGS-SBSC Inter-annual rainfall variability. Data suggest that inter-annual variation in rainfall patterns could result in plant mortality in dryland ecosystems. This research investigates differences in the responses of a common grass to drought depending on the rainfall treatment received during the previous year. Awarded May 2011. *\$19,500* for 1 year.

USGS-SBSC Dryland soil carbon with changing climate. This project takes advantage of a large climate manipulation experiment on the Colorado Plateau and focuses on determining the mechanisms behind observed acclimation of soil respiration to increased temperatures. Co-PI's: J. Belnap and C. Cleveland. Awarded May 2011. *\$16,000* for 1 year.

USGS-Invasive Plant Program. Funding to study the ecosystem effects of Tamarisk defoliation by Tamarisk beetle, focusing on (1) shifts in plant and animal community composition after defoliation and (2) on the role of coupled biogeochemical cycles, geomorphology, and hydrology in driving observed community shifts. Co-PI's: J. Belnap, P. Shafroth, S. Ostojka, P. Nagler. Awarded June 2010-September 2014. Canyonlands Research Station Portion is *\$201,000* to date.

Mendenhall USGS. Lead-PI on a proposal that received a post-doctoral fellow (Dr. Jane Zelikova) to use long-term grazing manipulations and a local elevation gradient to explore how climate change could affect relationships between plants, microbial communities and carbon cycling on the Colorado Plateau. Co-PIs: J. Belnap, N. Barger, R. Reynolds, M. Dettinger, C. Kendall, J. Harden. Post-doc selected June 2010 and over 2 yrs receives *\$184,000* for salary/benefits and *\$43,000* for research over 2 years.

NPS-Air Resources Division. Funded to explore how nitrogen deposition is affecting

GRANTS (Cont.)

U.S. National Park ecosystems in the Four Corners region of the U.S. The project will integrate data synthesis, modeling, collection of new NO_x deposition data, and fertilization plots to investigate how nitrogen deposition could change dryland community composition (plant and soil) and function, including exotic annual plant invasion and fire regimes. Co-PIs: T. Crews, L. Floyd-Hanna, J. Herring, J. Belnap, M. Miller. Awarded April 2010. \$63,000 for 1 year.

USGS Alternative Energy Group. Received base funding to enact short- and long term approaches to explore the potential for and consequences of biofuels development in the western U.S. Biogeochemical, ecological, modeling, and remote sensing perspectives are all used. Awarded March 2010. \$198,000/year in perpetuity.

USGS Facilities. Received competitive funds to create a state-of-the-art biogeochemical laboratory at the Moab, UT USGS-BRD Canyonlands Field Station. Awarded March 2010. \$189,000.

National Geographic Society. Research grant to continue work investigating how microbial community composition and function vary over the course of primary succession at a receding glacier in Perú in the Himalaya and Karakoram mountains. Co-PIs: S. Schmidt & P. Sowell. Awarded December 2008. \$30,000.

United Government of Graduate Students. University of Colorado at Boulder. Travel grant to support my presentation at the International Nitrogen Initiative (INI) meeting in Costa do Sauipe, Brazil. Awarded August 2007. \$700.

National Science Foundation. Doctoral Dissertation Improvement Grant (DDIG) to explore how microbial community composition differs on different species of rain forest tree and, in turn, how differences in community structure may relate to rates of ecosystem processes such as N fixation. Co-PI A. Townsend. Awarded May 2007. \$11,809.

National Science Foundation. Supplemental grant from the Integrative Graduate Education and Research Traineeship (IGERT) program to investigate the scientific and social effects of altered precipitation along a rainfall gradient on Eastern Bolivia. Co-PI N. Ascarrunz. Awarded June 2005. \$42,266.

University of Colorado Boulder Graduate School. Awarded to investigate the relationship between nitrogen-fixer community composition and rates of fixation. Awarded April 2005. \$2,300.

Beverly Sears Graduate Student Grant. University of Colorado Boulder. Provided to study rates of and controls over nitrogen fixation a tropical rain forest. Awarded March 2004. \$1,000.

Organization for Tropical Studies (OTS). Research grant to investigate how soil colonization by *Atta cephalotes* and subsequent abandonment affects soil biogeochemical cycling at the La Selva Research Station. Awarded March 2003. \$800.

PROFESSIONAL EXPERIENCE

Research Ecologist, **USGS**, Moab, UT, May 2008-present.

Postdoctoral Researcher, **University of Montana**,

May 2008-November 2010. Advisor was Cory Cleveland.

PROFESSIONAL EXPERIENCE (Cont.)

Research Ecologist, **USGS-SCEP Program**, Moab, UT, 2005-2007 summers only.

Teaching Assistant, Microbiology, **CU Boulder**, Boulder, CO Spring 2005.

Research Fellow, **NSF-GRFP**, Boulder, CO, 2005-2008 (excluding summers; deferred from 2003).

Research Fellow, **NSF-IGERT**, Boulder, CO, 2003-2005.

Research Assistant, **CU Boulder**, Boulder, CO Spring 2003.

Teaching Assistant, General Biology, **CU Boulder**, Boulder, CO Fall 2002.

Biological Science Technician, **USGS**, Moab, UT, April 1998-October 2001.

Biological Science Technician, **USGS**, Silverton, CO, August 1997-October 1997.

Wolk Chemistry Research Fellow, **Colgate University**, Hamilton, NY, 1996-1997.

OUTREACH, TEACHING, & PROFESSIONAL SERVICE

Adjunct Faculty, University of Montana.

Creator, Science for Guides, a local program in Moab, UT with the goal of translating cutting-edge regional science to local recreational guides who interact with hundreds of tourists per year. Moab, UT. March 2012-present.

Board of Trustees, KZMU community radio station in Moab, UT. 2014-present.

Invited Member of the Science, Technology, Engineering, and Mathematics Advisory Board, Moab, UT public school system. 2013-present.

Invited Member of the Science Advisory Board, Climate Change Science Institute of Oak Ridge National Lab.

Invited Member of the Science, Technology, Engineering, and Mathematics Advisory Board, Moab, UT public school system

Leader, U.S. Geological Survey John Wesley Powell Center for Synthesis and Analysis.

Created a series of workshops to bring together modelers and empiricists – traditionally relatively unconnected approaches to science – in an effort to support an integrated approach to future climate change research. First meeting April 2013.

Member of the Writing Team, Department of Energy sponsored workshop report: Research Priorities for Tropical Ecosystems Under Climate Change 2012, DOE/SC-0153. This report won the Society for Technical Communication's Best Of Show Award for 'providing a connected, thorough and eminently understandable explanation of a complicated but universally important subject to a diverse audience'.

Invited Contributor, Invited by Dr. Christian Koerner to be a part of a workshop funded by the European Science Foundation to explore increases in N-fixer plant invasion in cold environments, Furka Pass Switzerland, October 2012.

Invited Member of the Advisory Board for the journal *Issues in Ecology*.

Invited Member of the Board of Advisors for the journal *New Phytologist*.

Invited Participant, Department of Energy (DOE) workshop to determine the roadmap for DOE's Next Generation Ecosystem Experiments for the Tropics (NGEE-Tropics), June 2012.

Invited Participant, Department of Energy (DOE) workshop to determine the roadmap for DOE's Next Generation Ecosystem Experiments for the Tropics (NGEE-Tropics), June 2012.

Associate Editor, *Biogeochemistry Letters* section of the journal *Biogeochemistry*.

Associate Editor, for the journal *Ecology*, *Ecological Monographs*, *Ecological Applications*, and

OUTREACH, TEACHING, & PROFESSIONAL (cont.)

Plant Ecology and Biodiversity.

- Reviewer**, review for many peer-reviewed journals including *Nature*, *PNAS*, *Ecology Letters*, *Ecology*, *Ecosystems*, *Biogeochemistry*, *Global Change Biology* & *Oecologia*.
- Co-organizer**, Organized Oral Session for the Ecological Society of America (ESA) annual meeting, From Leaf to Biosphere: Global Climate Change and the Fate of Tropical Rain Forests. Austin, TX. August, 2011.
- Participant**, National Center for Ecological Analysis and Synthesis (NCEAS), Revisiting nutrient limitation in tropical forests. Santa Barbara. 2009-present. **Working Group Participant**, Ways Forward in Constructing Climate Manipulations in Tropical Forests Workshop, US Forest Service, San Juan, Puerto Rico, October 2010.
- Workshop Coordinator**, helped organize and present a workshop teaching tools to help scientists communicate effectively with the news media. This workshop integrated scientists and journalists. March 2008.
- Invited Counselor**, Expanding Your Horizons (EYH), gave hands-on classes introducing middle school girls to career options and opportunities in science. Fall 2004 - present.
- Collaborator**, established successful interaction with Bolivian scientists (at Universities and non-governmental organizations) and facilitated the travel of a Bolivian graduate student (Sandy Farrel) to Boulder to for a month of hands on learning of current biogeochemical techniques and to meet with local scientists. June-July 2006.
- Co-developer**, helped create an undergraduate climate change curriculum integrating information from the natural sciences, social sciences, business, policy, politics, and media coverage surrounding global climate change. Fall 2004-Spring 2006.
- Organizer**, Organized Oral Session for the Ecological Society of America (ESA) annual meeting, Controls over Nitrogen Fixation: A Global Perspective. San Jose, CA. August, 2007.
- Scientific Resource**, work with a teacher from the Dawson School (Melissa Barker) to teach 1 ½ hour classes to high school students about terrestrial biogeochemistry, pedogenesis, and social issues currently involving scientific information. Boulder, CO. October 2005, October 2006, November 2007.
- Resource Person**, Organization for Tropical Studies (OTS). Was invited to be an instructor of the OTS Tropical Ecology course for a week to give talks, hands-on workshops, and to advise research projects teaching graduate students about soil's role in tropical ecosystems. Cuerecí and La Selva Research Stations, Costa Rica. March 2005.
- Course Assistant**, Microbiology. University of Colorado, Boulder, taught lecture classes in Microbial Biogeochemistry, Environmental Microbiology, and Microbial Diversity with Dr. Steve Schmidt. Fall 2004.
- Teaching Assistant**, General Biology Laboratory. University of Colorado at Boulder. Fall Semester 2003.
- Invited Instructor**, Biological Soil Crusts 101. Taught a course covering the biology and ecology of biological soil crusts to groups ranging from grade school students to graduate students. March 1998-October 2002.
- Co-developer**, helped develop a curriculum for teachers of grade school students to

OUTREACH, TEACHING, & PROFESSIONAL (cont.)

help them prepare lectures and hands-on materials for study of biological soil crusts.
Fall 2000.

Invited Instructor, Shi Dine' summer camp (a camp for Navajo elementary school children designed to advance scientific understanding within the tribe). Gave a two-day class on scientific methods and semi-arid ecosystem ecology. Navajo Reservation.
July 2000.

Volunteer Instructor, Agricultural Planting Techniques. Helped local populations initiate viable planting techniques for sustainable crops. Lago de Atitlan, Guatemala,
Spring 1998.