

NICHOLE N. BARGER

Dept. of Ecology and Evolutionary Biology (EBIO), University of Colorado at Boulder
UCB 334, Boulder CO 80309-0334

Phone: 303.492.8239

nichole.barger@colorado.edu

Fax: 303.492.8699

PROFESSIONAL PREPARATION

- 2003 Ph.D., Graduate Degree Program in Ecology, Colorado State University
- 1998 M.S., The Graduate Group in Range Science, Department of Environmental
Science Policy and Management, University of California, Berkeley.
- 1995 B.A., The Evergreen State College, Olympia, WA.

STATEMENT OF SCHOLARSHIP

I am an ecosystem ecologist focused on understanding the impacts of land degradation on the health of our ecosystems and developing innovative strategies to restore ecosystems and their function to support the well-being of people throughout the world. My research group focuses on drivers and impacts of land degradation such as the ecological risks of fire mitigation treatments, historical drivers and biogeochemical responses to woody plant encroachment, and forest decline and regeneration. More recently in my research program we are exploring novel approaches to restore degraded soils by cultivating native soil organisms for restoration. In addition to my research, I am actively involved in international science policy activities. I served as a coordinating lead author on the Intergovernmental Science Policy Platform on Biodiversity and Ecosystem Services (IPBES) Global Land Degradation and Restoration assessment and I am also serving a four-year term on the United Nations Convention to Combat Desertification (UNCCD) Science Policy Interface group.

ACADEMIC AND PROFESSIONAL APPOINTMENTS

- 2018-present **Associate Chair for Undergraduate Studies.** Department of Ecology and
Evolutionary Biology. University of Colorado.
- 2015-present **Research Director.** The Nature Conservancy's Canyonlands Research Center.
- 2014-present **Associate Professor.** Department of Ecology and Evolutionary Biology.
University of Colorado.
- 2007-2014 **Assistant Professor.** Department of Ecology and Evolutionary Biology.
University of Colorado.
- Spring 2007 **Instructor.** University of Colorado, Environmental Studies Program.
- 2003-2007 **Postdoctoral Research Scientist.** INSTAAR – An Earth and Environmental
Research Institute, University of Colorado, Boulder.

- 1998-2003 **Ph.D. student**, Graduate Degree Program in Ecology, The Natural Resource Ecology Laboratory, Colorado State University.
- 1997-98 **Masters student**. The Graduate Group in Range Science, Department of Environmental Science Policy and Management, University of California-Berkeley.

RECOGNITION AND AWARDS

- 2018 Boulder Faculty Assembly Award for Excellence in Teaching and Pedagogy.
- 2017-2018 University of Colorado Faculty Leadership Institute.
- 2014-2015 Chancellor's Excellence in STEM Education Award. Transforming Graduate Training in STEM Education.

RESEARCH GRANTS

- 2017-2018 Lead Principal Investigator (PI), Innovative Seed Grant Program, University of Colorado. Monitoring landscape scale biocrust restoration on degraded drylands: Deploying remote sensing technologies from unmanned aerial systems, \$49,680
- 2017-2021 Lead PI, USDA NRI-Agriculture and Food Research Initiative. Restoring Ecosystem Services in Highly Degraded Grazing Lands: Testing Novel Approaches and Evaluating Trade-Offs with Current Livestock Management \$495,000
- 2016-2018 Co-PI, John Wesley Powell Center for Analysis and Synthesis. Completing the dryland puzzle: creating a predictive framework for biological soil crust function and response to climate change. \$142,500
- 2015-2019 Lead PI, Post-treatment plant and soil responses to fuels reduction. Bureau of Land Management and Utah Watershed Restoration Initiative. \$98,000
- 2014 Lead PI, National Geographic Committee for Research and Exploration. Are fairy circles the product of self-organizing vegetation patterning? \$19,600
- 2013-2018 Lead PI, Strategic Environmental Research and Development Program (SERDP). Achieving Dryland Restoration Through the Deployment of Enhanced Biocrusts to Improve Soil Stability, Fertility and Native Plant Recruitment, \$2,300,000
- 2011-2014 Co-PI, NASA/USDA North American Carbon Program (NACP). Carbon Management on Public Land in the Intermountain West: Multi-Scale Analysis of Carbon Stock Responses to Human and Natural Disturbance, \$617,000
- 2008-2012 Co-PI, Mellon Foundation. Nitrogen Inputs and Cycling in Ecosystems of the Western Cape Province of South Africa, \$293,000

- 2008-2012 Lead PI, USDA NRI-Managed Ecosystem Program. Development of a Science-Based Decision-Making Model for Restoration of Pinyon-Juniper Ecosystems, \$499,590
- 2005-2008 Co-PI, NASA North American Carbon Program (NACP). Regional Carbon Storage Responses to Woody Encroachment in Western Pinyon-Juniper Systems, \$812,000

RESEARCH PUBLICATIONS

- ◆ denotes *graduate student* authorship
- denotes *undergraduate* authorship
- denotes *post-doctoral research associate* authorship

Google scholar, H index = 24, i10-index = 37

61) Eldridge, D.J, S.C. Reed, S. Travers, M.A. Bowker, F. Maestre, J. Ding, C. Havrilla, E. Rodriguez-Caballero, **N.N. Barger**, B. Weber, A. Antoninka, J. Belnap, V. Bala Chaudhary, A. Faist, S. Ferrenberg, E. Huber-Sannwald, O.M.Issa, Y. Zhou. In review. The pervasive and multifaceted influence of biocrusts on water in the world's drylands. Proceeding of the National Academy of Sciences.

60) T.L. Morris◆, **N.N. Barger**, M.D. Cramer. In review. The role of generalist indigenous herbivores in constraining invasion of alien trees: *Rhabdomys pumilio* limits *Acacia cyclops* establishment. Biological Invasions.

59) Havrilla, C.A.◆, Villarreal, M. L., J.L. DiBiase■, M.C. Duniway, **N.N. Barger**. In review. Ultra-high resolution UAS remote sensing of biological soil crusts. Remote Sensing in Ecology and Conservation.

58) Velasco Ayuso, S., A. Giraldo-Silva, **N.N. Barger** and F. Garcia-Pichel. In revision. Testing the effects on yield and community composition of common versus native soil in the microbial inoculum production for biocrust restoration. Restoration Ecology.

57) Willemen, L., **N.N. Barger**, B. ten Brink, M. Cantele, B.F.N. Erasmus, J.L. Fisher, T. Gardner, T. G. Holland, F. Kohler, J.S. Kotiaho, G. Von Maltitz, G. Nangendo, R. Pandit, J.A. Parrotta, M. D. Potts, S. D. Prince, M. Sankaran, A. Brainich, L. Montanarella and R. Scholes. In press. How to halt the global decline of land. Nature Sustainability.

56) Faist, A.M.○, A.J. Antoninka, J. Belnap, M.A. Bowker, M.C. Duniway, F. Garcia-Pichel, S.C. Reed, A. Giraldo-Silva, S. Velasco-Ayuso, **N.N. Barger**. 2019. Inoculum and habitat amelioration efforts in biological soil crust recovery vary by desert and soil texture. Restoration Ecology. <https://doi.org/10.1111/rec.13087>.

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- 55) Antoninka, A.^o, M.A. Bowker, **N.N. Barger**, J. Belnap, A. Giraldo-Silva, S. Reed, F. Garcia-Pichel, M. Duniway. 2019. Addressing barriers to improve biocrust colonization and establishment in restoration. *Restoration Ecology*. <https://doi.org/10.1111/rec.13052>.
- 54) Giraldo-Silva A., C. Nelson, C. Penfold, **N.N. Barger** and F. Garcia-Pichel. 2019. Effect of preconditioning to the soil environment on the performance of 20 cyanobacterial cultured strains used as inoculum for biocrust restoration. *Restoration Ecology*. <https://doi.org/10.1111/rec.13048>.
- 53) Fick, S.E.^o, N. Day, M.C. Duniway, S. Hoy-Skubik, J. Belnap, **N.N. Barger**. 2019. Microsite enhancements for soil stabilization and rapid biocrust colonization. *Restoration Ecology*. <https://doi.org/10.1111/rec.13071>.
- 52) Morris, T.L.[♦], **N.N. Barger**, M.D. Cramer. 2019. Ecophysiological traits of invasive alien *Acacia cyclops* compared to native species in Strandveld vegetation of the Cape Floristic Region. *Austral Ecology*. DOI: 10.1111/aec.12827
- 51) Havrilla, C.A.[♦], A. Leslie, and **N.N. Barger**. 2019. Biocrusts are associated with increased plant biomass and nutrition at seedling stage independently of root-associated fungal colonization. *Plant and Soil*. DOI: 10.1007/s11104-019-04306-4
- 50) Fick, S.E.^o, **N.N. Barger**, J. Tatarko, M. Duniway. 2019. Induced biological soil crust controls on wind erodibility and dust (PM10) emissions. *Earth Surface Processes and Land Forms*. <https://doi.org/10.1002/esp.4731>
- 49) Havrilla, C.A.[♦], V.B. Chaudhary, A.J. Antoninka, M.A. Bowker, J. Belnap, D. Eldridge, A.M. Faist^o, S. Ferrenberg, A.D. Leslie[■], Y. Zhang, **N.N. Barger**. 2019. A global meta-analysis of vascular plant responses to biological soil crusts. *Journal of Ecology*. DOI: 10.1111/1365-2745.13269
- 48) Bethany, J.A. Giraldo-Silva, C. Nelson, **N.N. Barger**, and F. Garcia-Pichela. 2019. Optimizing production of nursery-based biological soil crusts for restoration of arid land soils. *Applied Environmental Microbiology* 85:e00735-19. DOI: 10.1128/AEM.00735-19
- 47) Fick, S.E.^o, **N.N. Barger**, M.C. Duniway. 2019. Hydrologic function of rapidly induced biocrusts. *Ecology*. <https://doi.org/10.1002/eco.2089>.
- 46) Duniway, M.C., A.A. Pfennigwerth, S. Fick, T. Naumann, J. Belnap, **N.N. Barger**. 2019. Dust from US drylands: A review of causes, consequences and solutions in a changing world. *Ecosphere*. <https://doi.org/10.1002/ecs2.2650>.
- 45) Giraldo-Silva A., C. Nelson, **N.N. Barger** and F. Garcia-Pichel. 2019. Nursing biological soil crusts: isolation, biomass production, conditioning and fitness test of indigenous cyanobacteria. *Restoration Ecology*. 27(4):793-803. <https://doi.org/10.1111/rec.12920>

- 44) Chock, T. ♦, A.J. Antoninka, A.M. Faist^o, M.A. Bowker, J. Belnap, **N.N. Barger**. 2019. Responses of biological soil crusts to rehabilitation strategies. *Journal of Arid Environments*. <https://doi.org/10.1016/j.jaridenv.2018.10.007>
- 43) Kapović Solomun M., **N.N. Barger**, A. Cerdac, S. Keesstrade, M. Marković. 2018 Assessing land condition as a first step to achieving land degradation neutrality: A case study of the Republic of Srpska. *Environmental Science and Policy* 90:19-27. <https://doi.org/10.1016/j.envsci.2018.09.014>
- 42) Havrilla, C.A. ♦ and **N.N. Barger**. 2018. Biocrust communities mediate bunchgrass recruitment in a hot desert ecosystem. *Ecosphere*. <https://doi.org/10.1002/ecs2.2361>
- 41) **Barger, N.N.**, Gardner, T.A., Sankaran, M., Belnap, J., Broadhurst, L., Brochier, V., Isbell, F., Meyfroidt, P., Moreira, F., Nieminen, T. M., Okuro, T., Rodrgiues, R. R., Saxena, V., and Ross, M. Chapter 3: Direct and indirect drivers of land degradation and restoration. In IPBES (2018): The IPBES assessment report on land degradation and restoration. Montanarella, L., Scholes, R., and Brainich, A. (eds.). Secretariat of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem services, Bonn, Germany. (Peer and government reviewed report).
- 40) Scholes, R., L. Montanarella, A. Brainich, **N.N. Barger**, B. Brink, M. Cantele et al. Summary for policymakers of the thematic assessment report on land degradation and restoration. In IPBES (2018): The IPBES assessment report on land degradation and restoration. Montanarella, L., Scholes, R., and Brainich, A. (eds.). Secretariat of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem services, Bonn, Germany. (Peer and government reviewed).
- 39) Kelsey, K.C. ♦, M.D. Redmond ♦, **N.N. Barger** and J.C. Neff. 2018. Species, climate and landscape physiography drive variable growth trends in subalpine forests. *Ecosystems* 21: 125 DOI 10.1007/s10021-017-0139-7.
- 38) Havrilla, C.A. ♦, A.M. Faist^o, **N.N. Barger**. 2017. Understory plant community responses to fuel-reduction treatments and seeding in an upland piñon-juniper woodland. *Rangeland Ecology and Management*. <https://doi.org/10.1016/j.rama.2017.04.002>
- 37) Antoninka, A., M.A. Bowker, P. Chuckran, **N.N. Barger**, S. Reed, J. Belnap. 2017. Maximizing establishment and survivorship of field-collected and greenhouse-cultivated biocrusts in a semi-cold desert. *Plant and Soil*. doi:10.1007/s11104-017-3300-3
- 36) Faist, A. ^o, J. Herrick, J. Belnap, J. Van Zee, **N.N. Barger**. 2017. Biological soil crust and disturbance controls on surface hydrology in a semi-arid ecosystem. *Ecosphere* 8(3): DOI: 10.1002/ecs2.1691
- 35) Velasco Ayuso A., A.G. Silva, C. Nelson, **N.N. Barger**, and F. Garcia-Pichel. 2017. Microbial nursery production of high-quality biological soil crust biomass for restoration of degraded dryland soils. *Applied and Environmental Microbiology* doi: 10.1128/AEM.02179-16

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- 34) Redmond, M.D. ♦, K. Kelsey ♦, A. Urza, **N.N. Barger**. 2017. Interacting effects of climate and landscape physiography on piñon pine growth using an individual-based approach. *Ecosphere* 8(3)
- 33) **Barger, N.N.**, Weber, B., Garcia-Pichel, F., Zaady, E., Belnap, J. 2016. Patterns and Controls on Nitrogen Cycling of Biological Soil Crusts. In: Weber, B., Büdel, B., Belnap, J. (eds) *Biological soil crusts: An Organizing Principle in Drylands*, Ecological Studies 226, Springer International Publishing Switzerland, pp 257-285. (Book Chapter)
- 32) Cramer, M, **N.N. Barger**, W. Tschinkel. 2016. Edaphic properties enable facilitative and competitive interactions resulting in fairy circle formation. *Ecography* DOI: 10.1111/ecog.02461
- 31) Gillan, J.K, J.W. Karl, **N.N. Barger**, A. Elaksher, and M Duniway. 2016. Spatially explicit rangeland erosion monitoring using high-resolution digital aerial imagery. *Rangeland Ecology and Management*. doi:10.1016/j.rama.2015.10.012
- 30) Morris, T.L. ♦, **N.N. Barger**, and M.D. Cramer. 2015. Competitive resistance of a native shrubland community to invasion by the alien invasive tree species, *Acacia cyclops*. *Biological Invasions*. DOI: 10.1007/s10530-015-0978-0
- 29) Redmond, M.D. ♦, N.S. Cobb, M.J. Clifford and **N.N. Barger**. 2015. Woodland recovery following drought-induced tree mortality across environmental stress gradients. *Global Change Biology* 21:3685-3695. DOI: 10.1111/gcb.12976
- 28) **Barger, N.N.** and C. Woodhouse. 2015. Piñon pine (*Pinus edulis* Engelm.) growth responses to climate and substrate in southern Utah, U.S.A. *Plant Ecology* DOI 10.1007/s11258-015-0478-4.
- 27) Redmond, M.D. ♦, E.E. Golden ■, N.S. Cobb, and **N.N. Barger**. 2014. Vegetation management across Colorado Plateau BLM lands: 1950-2003. *Rangeland Ecology and Management*. DOI: 10.2111/REM-D-13-00171.1
- 26) Cramer, M.C. and **N.N. Barger**. 2014. Are mima-like mounds the consequence of long-term stability of vegetation spatial patterning? *Paleogeography, Paleoclimatology, and Paleoecology*. 409:72-83. DOI: 10.1016/j.palaeo.2014.04.026
- 25) Karl, J.W., J.K. Gillan, M. Duniway, **N.N. Barger**, and J.E. Herrick. 2014. Interpretation of high-resolution imagery for detecting rangeland cover composition change. *Ecological Indicators*. 45:570-578. 10.1016/j.ecolind.2014.05.017.
- 24) Redmond, M.D. ♦, T. J. Zelikova and **N.N. Barger**. 2014. Limits to understory plant restoration following fuel reduction in a piñon-juniper woodland. *Environmental Management*. 10.1007/s00267-014-0338-3

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- 23) Cramer, M.C. and **N.N. Barger**. 2013. Are Namibian "fairy circles" the consequence of self-organizing spatial vegetation patterning? PLOS ONE. 8(8), e70876.doi:10.1371/journal/pone.0070876
- 22) Fernandez, D.P., J.C. Neff, C. Huang, G.P. Asner, and **N.N. Barger**. 2013. Twentieth century carbon stock changes related to piñon-juniper expansion into a black sagebrush community. Carbon Balance and Management. 8:8, doi:10.1186/1750-0680-8-8.
- 21) **Barger, N.N.**, S.C. Castle, and G.N. Dean. 2013. Denitrification from nitrogen-fixing biologically crusted soils in a cool desert environment, southeast Utah, USA. 2013. Invited special issue on biological soil crusts. Ecological Processes 2:16, DOI:10.1186/2192-1709-2-16
- 20) Redmond, M.D.♦ and **N.N. Barger**. 2013. Tree regeneration following drought- and insect-induced mortality in piñon-juniper woodlands. New Phytologist, DOI: 10.1111/nph.12366.
- 19) Redmond, M.D.♦, N.S. Cobb, M.E. Miller, and **N.N. Barger**. 2013. Long term effects of chaining treatments on vegetation structure in piñon-juniper woodlands of the Colorado Plateau. Forest Ecology and Management 305:120-128. DOI: 10.1016/j.foreco.2013.05.020.
- 18) Kasischke, E.S., B.D. Amiro, **N.N. Barger**, N.H.F. French, S.J. Goetz, G. Grosse, M.E. Harmon, J.A. Hicke, S. Liu, and J.G. Masek. 2013. Impacts of disturbance on the terrestrial carbon budget of North America: Journal of Geophysical Research – Biogeosciences 118:303-316, DOI: 10.1002/jgrg.20027.
- 17) Redmond, M.D.♦, F. Forcella and **N.N. Barger** Declines in pinyon pine cone production associated with regional warming. 2012. Ecosphere 3:art120. <http://dx.doi.org/10.1890/ES12-00306.1>.
- 16) Ross, M.■, S.C. Castle, and **N.N. Barger**. 2012. Recent fuels reduction treatment effects on herbaceous communities and soils in a pinyon-juniper ecosystem. Journal of Arid Environments 79:84-92, doi:10.1016/j.jaridenv.2011.11.019.
- 15) Huang C., G.P. Asner, and **N.N. Barger**. 2012. Regional variation in net primary production of pinyon-juniper ecosystems. Ecological Modeling 227:82-92, doi:10.1016/j.ecolmodel.2011.12.016.
- 14) Castle, S.C., C.D. Morrison■ and **N.N. Barger**. 2011. Extraction of chlorophyll a from biological soil crusts: A comparison of solvents for spectrophotometric determination. Soil Biology and Biochemistry 43:853-856.
- 13) **Barger N.N.**, S.R. Archer, J.L. Campbell, C. Huang, J.A. Morton♦ and A.K. Knapp. 2011. Woody encroachment and the North American carbon budget. Journal of Geophysical Research –Biogeosciences 116, G00K07, DOI: 10.1029/2010JG001506.
- 12) Morris, T.L.♦, K.J. Esler, **N.N. Barger**, S.M. Jacobs and M.D. Cramer. 2011. Ecophysiological traits associated with the competitive ability of invasive Australian acacias. Diversity and Distributions, 17: 898–910, DOI: 10.1111/j.1472-4642.2011.00802.x.

- 11) Huang C., G.P. Asner, **N.N. Barger**, J.C. Neff, and L. Floyd-Hanna. 2010. Regional aboveground live carbon losses due to drought-induced tree dieback in piñon-juniper ecosystems. *Remote Sensing of the Environment* 114:1471-1479.
- 10) **Barger, N.N.**, H.A. Adams, C. Woodhouse, J.C. Neff, G.P. Asner. 2009. Influence of livestock grazing and climate on pinyon pine (*Pinus edulis*) dynamics. *Rangeland Ecology and Management* 62:531-539.
- 9) Neff, J.C., T. **N.N. Barger**, W.T. Baisden, D. Fernandez, and G.P. Asner. 2009. Soil carbon storage responses to expanding pinyon-juniper populations in southern Utah. *Ecological Applications* 19:1405-1416.
- 8) Huang C., G.P. Asner, R.E. Martin, **N.N. Barger**, and J.C. Neff. 2009. Multi-scale analysis of tree cover and carbon stocks in pinyon-juniper woodlands. *Ecological Applications* 19:668-681.
- 7) Hartley A.E., **N.N. Barger**, J. Belnap, G.S. Okin. 2007. Nutrient Cycling in Dryland Ecosystems. In: Marschner P, Rengel Z (eds) *Nutrient Cycling in Terrestrial Ecosystems*. Series: *Soil Biology*, Volume 10, pp. 271-299 Springer Verlag. (Peer reviewed book chapter)

Started position at the University of Colorado

- 6) **Barger, N.N.**, J.E. Herrick, J.W. Van Zee, and J. Belnap. 2006. Impacts of biological soil crust disturbance and composition on C and N losses from water erosion. *Biogeochemistry* 77:247-263.
- 5) **Barger, N.N.**, J. Belnap, D. S. Ojima, and A. Mosier. 2005. NO gas loss from biologically crusted soils in Canyonlands National Park, Utah. *Biogeochemistry* 75:373-391.
- 4) Belnap, J., J.K. Welter, N.B. Grimm, **N.N. Barger**, and J. Ludwig. 2005. Linkages between microbial and hydrologic processes in arid and semi-arid watersheds. *Ecology* 86: 298-307.
- 3) **Barger, N.N.**, D.S. Ojima, J. Belnap, W. Shiping, W. Yanfen, Z. Chen. 2004. Changes in plant functional groups, litter quality, and soil C and N mineralization with sheep grazing in an Inner Mongolian grassland. *Journal of Range Management* 57:613-619.
- 2) **Barger, N.N.**, C.M. D'Antonio, E. Cuevas, and T. Ghneim. 2003. Constraints to colonization of an African pasture grass (*Melinis minutiflora*) in a Venezuelan savanna. *Plant Ecology* 167:31-43.
- 1) **Barger, N.N.**, C.M. D'Antonio, T. Ghneim, K. Brink, and E. Cuevas. 2002. Nutrient limitation to primary productivity in a secondary savanna in Venezuela. *Biotropica* 34:493-501.

EDUCATION AND MENTORING PUBLICATIONS

- 6) Hagerty, S. ♦, **N.N. Barger**, S. Taylor, J. Carter ♦, and J. Gruber. 2018. Written Lab Agreements Improve Mentoring. *Nature Correspondence*. *Nature* 563, 325 doi: 10.1038/d41586-018-07383-0 (Editorial review)
- 5) S.M. Love Stowell ♦, A.C. Churchill ♦, A.K. Hund ♦, K.C. Kelsey ♦, M.D. Redmond ♦, S.A. Seiter, and **N.N. Barger**. 2015. Transforming graduate training in STEM education. *Bulletin of the Ecological Society of America*. (Editorial review)
- 4) Hoskinson, A.M. ◊, **N.N. Barger**, and A.P. Martin. 2014. Keys to a successful student-centered classroom: Three recommendations. *Bulletin of the Ecological Society of America*. (Editorial Review)
- 3) Redmond, M.D. ♦ and **N.N. Barger**. 2014. Impacts of climate change on pinyon pine cone production. *National Center for Case Study Analysis*. (Peer review)
- 2) *Grandy, S. and **N.N. Barger**. 2010. Implementing active learning strategies: Tales from two new life sciences professors at research universities. *Journal of Academic Leadership* Volume 8(2). *Denotes equal contributions by the authors. (Editorial Review)
- 1) Beers, A.T. ♦, T.S. Potter ♦, A.C. Churchill ♦, A.M. Faist ♦, E.S. Golden ◻, H.R. Filkins ♦, J.J. Hick ♦, and **N.N. Barger**. 2013. Advocating for science writing cooperatives in graduate programs. *Bulletin of the Ecological Society of America* 94:245–246. DOI: 10.1890/0012-9623-94.3.245. (Editorial Review)

CONFERENCE PROCEEDINGS

- Hoenigman, R. ♦, E. Bradley, and **N.N. Barger**. Water conservation through facilitation. In *Proceedings of the Twenty-Fifth AAAI Conference on Artificial Intelligence*, San Francisco, CA, pages 1337–1342, 2011.
- Hoenigman, R. ♦, E. Bradley, and **N.N. Barger**. Agent-Scapes—Designing water efficient residential landscapes using distributed agent-based optimization. In *Proceedings of the 12th Annual Conference Companion on Genetic and Evolutionary Computation Conference: Late Breaking Papers*, Portland, OR, pages 1777-1784, 2010.

INTERNATIONAL SCIENCE POLICY ACTIVITIES

- 2019 **Delegate to UNCCD Conference of Parties-14**. Expert and scientist representing the Science Policy Interface group. September 2019, New Delhi, India.
- 2019 **Technical Report**. Chotte, J.L., Aynekulu Betemariam, E., Cowie, A., Campbell, E., Vlek, P., Lal, R., Kapović-Solomun, M., von Maltitz, G., Kust, G., **Barger**, N.N., Vargas, R., and Gastrow, S. 2019. Realising the Carbon Benefits of Sustainable Land Management Practices: Guidelines for Estimation of Soil Organic Carbon in the Context of Land Degradation Neutrality Planning and

- Monitoring. A report of the Science-Policy Interface. United Nations Convention to Combat Desertification (UNCCD), Bonn Germany.
- 2019 **Contributing Author.** Global Assessment of Biodiversity and Ecosystem Services, Deserts and Xeric Shrublands. Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES).
- 2019 **Managing Committee Member.** IPBES Land Degradation and Restoration Web Conference.
- 2018 **IPBES Delegate.** Represented IPBES as a delegate to the Convention on Biological Diversity (CBD) Subsidiary Body for Science, Technology, and Technological Advice (SBSTTA). Montreal, Canada.
- 2018-present **Science Policy Interface Committee Member.** UNCCD Science Policy Interface.
- 2015-2018 **Coordinating Lead Author.** Land Degradation and Restoration Global Assessment, IPBES.
- 2015 **U.S. delegate.** Represented the U.S. government at the 3rd Plenary Meeting of IPBES. Bonn, Germany, Jan. 12-17.
- 2014 **Expert group member.** IPBES Scoping for a global assessment of land degradation and restoration. Beijing, China, Sep. 6-12.

TECHNICAL REPORTS FOR RESOURCE MANAGERS

Faist, A., A. Antoninka, **N.N. Barger**, J. Belnap, M. Bowker, M. Duniway, S. Fick, A. Giraldo-Silva, C. Nelson, F. Garcia-Pichel, S. Reed, S. Velasco-Ayuso. 2019. 1st Edition, Biocrust restoration operational manual. 2nd edition in preparation.

TEACHING AND MENTORING ACTIVITIES

Science Education and Mentoring Presentations

N.N. Barger. Mentoring Postdoctoral Associates and Fellows. Hosted by UCB Research and Innovation Office (RIO). November 2019.

Gruber, J. and **N.N. Barger.** Workshop in Best Practices in Graduate Student and Post-Doc Mentoring. May 2019. Hosted by UCB RIO.

Gruber, J. and **N.N. Barger.** Best Practices in Mentoring in Research Labs. April 2019. Presentation to Graduate Chairs.

Gruber, J. and **N.N. Barger**. Best Practices in Mentoring in Research Labs. Graduate Teaching Program, University of Colorado. October 2018.

Barger, N.N. University of Colorado, Faculty Teaching Excellence Program (FTEP), Aligning Course Assignments with Learning Goals. Workshops given twice a year in 2017 and 2018.

Barger, N.N. Utah State University, Ecology Seminar Series. Science Education: Making the Case to Transform STEM Education in Higher Education. November 2016.

Barger, N.N., A. Hund and M. Redmond. Center for the Integration of Research, Teaching and Learning (CIRTL) Reads. Online national discussion of our published paper Transforming graduate training in STEM education. September 2015.

Barger, N.N. University of Colorado Graduate Teaching Program (GTP) Fall Intensive Workshop, The Flipped Classroom. Workshop for graduate students on creating a student centered, active learning environment in their courses. Fall 2013, 2014, 2015.

Hoskinson, A.M., A.P. Martin, and **N.N. Barger**. Ready to flip your classroom? Three recommendations. CU Science Education Initiative and Center for STEM Learning End of the Year Event. May 2013.

Barger, N.N. Center for the Integration of Research, Teaching, and Learning (CIRTL)/ Teaching Institute for Graduate Education Research (TIGER) Series. Science Students' Self-Evaluations of Their Own Course Work. University of Colorado. November 2008.

Science Education Leadership

2015-present **Advisory Board Member**. NSF-funded Transforming Education, Supporting Teaching and Learning Excellence (TRESTLE) project to support improvements in undergraduate STEM education. University of Colorado.

2014-2017 **Coordinator**. 2014-2017. EBIO Graduate Teaching Program. Provided graduate student training in evidence-based teaching practices

2016 **Panel Member**. Social Dynamics in the Classroom, Sponsored by CU Student Government (CUSG), the Boulder Faculty Assembly (BFA), and the Office of Faculty Affairs.

2015-2016 **Committee Member**. American Association of Universities (AAU) STEM Education Project.

2014-2015 **Coordinator**. Chancellor's Excellence in STEM Education Graduate Student Workshops.

STUDENT MENTORING AND ADVISING

Graduate Student and Post-Doctoral Advising

2018-present	Sierra Jech, IQBio/EBIO Ph.D. expected May 2024
2018-2019	Steve Fick, Post-Doctoral Research Associate
2017-present	Claire Karban, Ph.D. expected May 2022
2015-2017	Akasha Faist, Post-Doctoral Research Associate
2016-2018	Lior Gross, BA/MA awarded December 2018
2012-2019	Caroline Havrilla, NSF-GRFP Recipient, Ph.D. awarded May 2019
2011-2015	Miranda Redmond, NSF-GRFP Recipient, Ph.D. awarded May 2015
2010-2012	Tamara Jane Zelikova, USGS Mendenhall Post-Doctoral Research Associate
2009-2012	Heidi Guenther, EBIO, M.A. awarded December 2012
2009-2014	Taryn Morris, EBIO, Schlumberger Fellow, Ph.D. awarded May 2014
2009-2012	Rhonda Hoenigman, co-advised Ph.D. in Computer Science, Ph.D. August 2012

Undergraduate Training

Honors theses

2018-present	Rachael Merkt, expected December 2019
2015-2016	Hanna Cruz, Summa Cum Laude, May 2016
2013-2014	Scott Clingan, Cum Laude May 2014, ENV5
2010-2012	Matt Peoples, EBIO Honors Program, Magna Cum Laude, May 2012
2008-2010	Matt Ross, EBIO Honors Program, Graduated Summa Cum Laude, May 2010

My lab group has supervised over 80 undergraduate research assistants, independents study projects, and volunteers since 2008.

Graduate and Honors Student Committee Membership

2019-Present	Corinne Walsh, PhD student, EBIO
2019-Present	Joel Singly, PhD student, EBIO
2017-Present	Isabel Schroeter, PhD student, EBIO
2017-Present	Julie Larson, PhD student, EBIO
2018-Present	Chrissy Mott, PhD student, Northern Arizona University
2018-Present	Irfan Alam, PhD student, EBIO
2018-Present	Laurel Brigham, PhD student, EBIO
2015-Present	Hannah Holland-Moritz, Ph.D., EBIO
2015-2019	Ana Giraldo Silva, Ph.D., ASU
2015-2017	Margaret Habib, MA, EBIO
2014-2015	Joey Knelman, Ph.D., EBIO
2013-2016	Cameron Naficy, Ph.D., Geography
2013-2014	Andreas Wion, Honors, ANTH
2013-2015	Melinda Markin, Ph.D., EBIO
2013-2015	Scott Ferrenberg, Ph.D., EBIO
2013-2017	Cameron Naficy, Ph.D., Geography
2013-2015	Kathy Kelsey, Ph.D., Geosciences
2013	Matt Olivier, Honors, ENV5
2013	Alex Loomis, Honors, Geography
2012-2018	Teal Potter, Ph.D. student, EBIO

2012-2016	Megan Caldwell, Ph.D., EBIO
2012-2018	Teal Potter, Ph.D. student, EBIO
2011-2018	Amy Churchill, Ph.D., EBIO
2012-2014	Chris Javornik, B.A./M.A.
2012-2014	Becky Poole, EBIO, MA student
2011-2014	Amy Steiker, EBIO, MA student
2010-2011	Caitlyn Clark, Honors, Anthropology
2010-2015	Akasha Faist, Ph.D. student, EBIO
2010	Simon Power, M.S., University of Cape Town (External examiner)
2010-2012	Adam Markovits, M.S. student, EBIO
2010-2014	Samantha Weintraub, Ph.D.
2009-2014	Janet Prevey, Ph.D. EBIO
2008-2014	Chris Gray, Ph.D. EBIO
2008-2010	Charlie Lawton, M.S. EBIO
2008	Blake Angelo, Honors, EBIO
2007-2008	Sarah Castle, M.S., Geology

SERVICE ACTIVITIES

Service Within the University of Colorado

2019	Greenhouse Common Garden Committee
2019	EBIO Comprehensive Review for Corwin (Chair)
2019	EBIO Lecturer Search (Chair)
2019-present	EBIO Early Career Faculty Mentoring Program
2018-2019	EBIO Large Scale Ecologist Search (Chair)
2018	UCB Research and Innovation Office (RIO), Innovative Seed Grant Reviewer
2018-present	EBIO Associate Chair for Undergraduate Studies
2017-present	EBIO Executive Committee
2015	UCB Provost Committee, Coordinator, School of the Environment and Sustainability Teaching Scholars Program
2015	EBIO Merit Evaluation Committee
2015-2016	UCB Graduate School, Graduate Student Climate Task Force.
2014-present	UCB Faculty Teaching Excellence Program, Director of the Early Career Faculty Program in Natural Sciences, University of Colorado.
2016	Discipline Based Education Researcher Search Committee
2014-2016	UCB Foundation, Western Public Lands Fellowship Coordinator
2014-2017	EBIO Budget Committee Chair
2014-2015	EBIO Graduate Committee
2014	UCB Provost Committee, School of the Environment and Sustainability Implementation Committee
2014	UCB Academic Affairs, Undergraduate Persistence Working Group Member.
2013-2014	UCB Boulder Faculty Assembly (BFA) Faculty-Student Mentoring Program
2013	EBIO Environment and Sustainability Visioning Committee (Spring semester)
2011-2012	EBIO Botany Search Committee
2011-2012	EBIO Academic Review and Planning Advisory Committee (ARPAC)
2010-2011	EBIO Executive Committee

- 2010-2017 EBIO Budget Committee
 2009 EBIO Merit Evaluation Committee
 2008 LEAP Workshop on balancing career goals and family life, December
 2008-2009 EBIO Graduate Committee
 2007-2008 EBIO Undergraduate Curriculum Committee
 2008 EBIO Gordon Alexander Fellowship selection committee

Science and Land Management Service

- 2019 **Organizer.** Colorado Plateau Science and Management Forum. A forum for collaboration between researchers and resource managers on the Colorado Plateau.
- 2016 **Organizer.** Canyon Country Science and Management Symposium, Moab, UT. December 2016. A forum to exchange research information with state and federal agencies.
- 2012 **Organizer.** Canyon Country Science Symposium, Moab, UT. March 2012. A forum to exchange research information with state and federal agencies.
- 2009-2015 **Science and Management Advisory Council Member.** Canyonlands Research Center, The Nature Conservancy, Utah.
- 2009-2014 **Advisory Board.** Friends of Boulder Open Space Science. Boulder, CO

Reviewer and Editorial Activities

- 2014-2017 Subject Matter Editor, Rangeland Ecology and Management
 2012-2017 Subject Matter Editor, Ecosphere, Ecological Society of America (ESA) Journal
 2011 EPA Science To Achieve Results (STAR) Panel Review
 2010 Joint Fire Science Program Panel Review
 2010 Guest Associate Editor for Ecological Applications
 2007-present Proposal reviews for NSF Division of Environmental Biology and European Union Polar Climate Programme

Professional Affiliations

- 2000-present Society for Range Management
 1994-present Ecological Society of America

MEDIA RELATED TO SCHOLARLY WORK

The complexities of pinyon-juniper forests. 2019. KZMU radio. Moab, Utah.
https://www.kzmu.org/pinyon_juniper/

CU Boulder Today. 2017. Solving the ecological mystery of Africa's fairy circles. <https://www.colorado.edu/today/2017/08/22/solving-ecological-mystery-africas-fairy-circles>

Utah Public Radio. December 2016. Don't Bust the Crusts - Restoring Disturbed Biological Soil Crusts. <http://upr.org/post/dont-bust-crust-restoring-disturbed-soil-crusts>

Utah Public Radio. November 2016. Cowboys and Scientists. <http://upr.org/post/cowboys-and-scientists>.

Boulder Daily Camera. CU-Boulder professor leads efforts to erase war machines' scars. Nov. 21, 2012. <https://www.dailycamera.com/2012/11/21/cu-boulder-professor-leads-efforts-to-erase-war-machines-scars/>.

OUTREACH ACTIVITIES

- 2018 Instructor. Northern Arizona University Doris Duke Conservation Scholars Program at the Canyonlands Research Center. July 4-6, 2018.
- 2015 Science Fair Judge. Mesa Elementary, Boulder Valley School District.
- 2011 Co-led two one-day field trips for state and federal land managers to highlight research on fuels reduction. Moab, Utah. March and May 2011.
- 2009 Denver Museum of Nature and Science, Climate Change Workshop for 4th and 8th grade teachers. *Climate Change in the Classroom*. November. Invited.
- 2007 Denver Botanic Garden, Café Botanique. Public talk. *A century of crust busting on the Colorado Plateau*. November. Invited.

PRESENTATIONS (*Since 2007*)

* = outreach presentations

62) **Barger, N.N.** Improving the Well-Being of 40% of Humanity: Evidence for Better Action on Land Degradation and Restoration. Science for Decision Making Event. UNCCD – Conference of Parties (COP) – 14. New Delhi, India. Sep. 6, 2019.

61) **Barger, N.N.** Science Day Panel ‘Foundation for a Healthy Planet: The Enabling Environment for Land Degradation Neutrality. – UN Convention to Combat Desertification (UNCCD) Conference of Parties (COP) – 14. New Delhi, India. Sep. 5, 2019

60) **Barger, N.N.** Key messages from the IPBES Land Degradation and Restoration Assessment. UN Development Program Event–COP14. New Delhi, India. Sep. 3, 2019.

58) Fick, S.E., **N.N Barger** (presenter), M. Duniway. Hydrologic function of rapidly induced biocrusts. 4th International Biocrust Conference. Brisbane, Australia. August 27-31, 2019.

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- 57) Willemen, L.* and **N.N. Barger***. Monitoring integrated restoration activities: enabling track-changes in complex land systems. Global Land Programme Open Science Meeting. Bern, Switzerland. April 24-26. 2019. (*Co-presented)
- 56) **Barger, N.N.** and Maria Angelica Fernandez. Presentation of draft recommendations from the Report on Land Degradation and Restoration Assessment to the UNCDD Science Policy Interface. Bonn, Germany. February 25-27, 2019.
- 55) **Barger, N.N.**, R. Mann, C. Karban, A. Faist, D. Hoover, M. Duniway. Restoring ecosystem services in highly degraded grazing lands: Testing novel approaches and evaluating trade-offs with current livestock management. USDA – Agriculture and Food Research Institute (AFRI) PI meeting, Washington, D.C. Dec. 5-7, 2018.
- 54) **Barger, N.N.** and Maria Angelica Fernandez. Presentation of Land Degradation and Restoration Assessment key messages to UN Convention to Combat Desertification Science Policy Interface. Bonn, Germany. October 9-11, 2018.
- 53) **Barger, N.N.**, Faist, A., Antoninka A.J., Giraldo Silva, A., Velasco Ayuso, S., Bowker, M.A., Reed, S.C., Duniway, M., Garcia-Pichel, F., Belnap, J. Biocrust inoculum development and soil stabilization strategies to promote biocrust restoration. Society for Ecological Restoration – Europe. Reykjavik, Iceland. September 9-13, 2018.
- 52) **Barger, N.N.** Presentation of Land Degradation and Restoration Assessment key messages to the Convention on Biological Diversity Subsidiary Body on Scientific, Technical and Technological Advice. Montreal, Canada. July 1-3, 2018.
- 52) **Barger, N.N.** Drivers of land degradation and restoration of degraded land. Presentation of Land Degradation and Restoration Assessment key messages to country parties. IPBES Plenary-6. Medellin, Colombia. March 17-24, 2018.
- 51) **Barger, N.N.**, A. Faist, S.C. Reed, M. Duniway. Biocrust inoculation and soil stabilization to promote dryland soil restoration. SERDP-ESTCP Symposium. Washington D.C. November 2017
- 50) **Barger, N.N.**, Faist, A., Antoninka A.J., Giraldo Silva, A., Velasco Ayuso, S., Bowker, M.A., Reed, S.C., Duniway, M., Garcia-Pichel, F., Belnap, J. Biocrust inoculum development and soil stabilization strategies to promote biocrust restoration. Drylands, Deserts, and Desertification Conference. Sde Boker, Israel. November 2017.
- 49) **Barger, N.N.**, M.C. Cramer, and W. Tschinkel. The role of soil resources and wildlife grazing in the maintenance of fairy circles. Invited talk at the Drylands, Deserts, and Desertification Conference. Sde Boker, Israel. November 2017.
- 48) **Barger, N.N.** Plenary talk. Society for Range Management. Restoration Challenges and Discoveries in Ecosystems of the Colorado Plateau. Society for Range Management. January 2017.

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- 47) **Barger N.N.** Utah State University. Advances in Biological Soil Crust Restoration in North American Drylands. November 2016
- 46) **Barger N.N.** Northern Arizona University. Time Is On Our Side: Successes and Unintended Consequences of Ecological Restoration of Western U.S. Drylands. October 2016.
- 45) **Barger N.N.** Biocrust Restoration Symposium Introduction. Biocrust 3 International Conference on Biocrusts. Moab, Utah. September 2016.
- 45) **Barger, N.N.** Plant and soil responses to fuels reduction in an upland pinyon-juniper woodland. Pinyon-Juniper Adaptation Strategy Workshop for Pinyon-Juniper Landscape in SW Colorado. March 2016.
- 44) **Barger, N.N.** Utah Chapter of The Nature Conservancy. Conservation Voices. The Nature We Depend on Depends on Us: Restoration Efforts on the Colorado Plateau. April 2016.
- 43) **Barger, N.N.** Utah Chapter of The Nature Conservancy. Presentation to the board. December 2015
- 42) Redmond, M.D., N.S. Cobb, M.J. Clifford, and **N.N. Barger**. Woodland recovery following drought-induced tree mortality across an environmental stress gradient. 13th Biennial Conference of Science and Management on the Colorado Plateau. Flagstaff, AZ. October 2015.
- 41) Velasco Ayuso, S., A.M. Giraldo Silva, C.J. Nelson, **N.N. Barger**, A.J. Antoninka, M.A. Bowker, F. Garcia-Pichel. Key factors controlling the growth of biological soil crusts: towards a protocol to produce biocrusts in greenhouse facilities. 13th Biennial Conference of Science and Management on the Colorado Plateau. Flagstaff, AZ. October 2015.
- 40) Giraldo Silva, A., C. Nelson, **N.N. Barger**, F. Garcia-Pichel. Nursing the biological soil crust restoration: cyanobacteria isolation, lab cultivation, scaling up, and inoculum conditioning. 13th Biennial Conference of Science and Management on the Colorado Plateau. Flagstaff, AZ. October 2015.
- 39) Antoninka, A.J., M.A. Bowker, **N.N. Barger**, S.C. Reed, J. Belnap, and K.D. Doherty. Restoring the living skin of the earth: progress in biocrust restoration in the Great Basin and Chihuahuan Desert. 13th Biennial Conference of Science and Management on the Colorado Plateau. Flagstaff, AZ. October 2015.
- 38) Faist, A.M., **N.N. Barger**, M.C. Duniway, S.C. Reed, M.A. Bowker, F. Garcia-Pichel, and J. Belnap. Evaluating field success of biological soil crust restoration using lab and greenhouse grown inocula and best delivery practices. 13th Biennial Conference of Science and Management on the Colorado Plateau. Flagstaff, AZ. October 2015.
- 37) Bowker, M.A., A.J. Antoninka, S.C. Reed, K.D. Doherty, J. Belnap and **N.N. Barger**. Rapid cultivation of N-fixing lichens and biocrusts for rehabilitation of drylands. 13th Biennial Conference of Science and Management on the Colorado Plateau. Flagstaff, AZ. October 2015.

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- 36) Havrilla, C. and **N.N. Barger**. The role of biocrusts in regulating dryland plant communities and exotic plant invisibility. 13th Biennial Conference of Science and Management on the Colorado Plateau. Flagstaff, AZ. October 2015.
- 35) **Barger, N.N.** Biological soil crusts: Restoring their function in dryland ecosystems. 13th Biennial Conference of Science and Management on the Colorado Plateau. Flagstaff, AZ. October 2015.
- 34) Garcia-Pichel F., A. Antoninka, M. Bowker, A.G Silva, Corey Nelson, S.V. Ayuso, **N.N. Barger**, J. Belnap, S. Reed, and M. Duniway. Restoring the biological crust cover of soils across biomes in arid North America. European Geophysical Union. April 2015.
- 33) Antoninka, A.A., M. Bowker, **N.N. Barger**, J. Belnap, F. Garcia-Pichel. Biocrust restoration methods in a cold and hot desert. 12th Biennial Conference of Science and Management on the Colorado Plateau. Flagstaff, AZ. September 2013.
- 32) **Barger, N.N.**, H. Guenther, M.D. Redmond, T.J. Zelikova, M.E. Miller, and J.S. Herrick. Plant community response to fuels reduction treatments in upland pinyon-juniper woodlands. 12th Biennial Conference of Science and Management on the Colorado Plateau. Flagstaff, AZ. September 2013. Invited.
- 31) Redmond, M.D. and N.N. Barger. Tree regeneration following drought and insect-induced mortality in piñon-juniper woodlands. 12th Biennial Conference of Science and Management on the Colorado Plateau. Flagstaff, AZ. September 2013.
- 30) Gillan, J., J.W. Karl, **N.N. Barger**, M.C. Duniway and A. Elaksher. Using high-resolution aerial photogrammetry to 3-dimensionally model soil erosion in rangeland ecosystems. 98th Annual Meeting of the Ecological Society of America. Minneapolis, MN OR. August 2013.
- 29) Redmond, M.D. and **N.N. Barger**. Tree regeneration following drought and insect-induced mortality in piñon-juniper woodlands. 98th Annual Meeting of the Ecological Society of America. Minneapolis, MN OR. August 2013.
- 28) **Barger N.N.**, H.S. Guenther, M.E. Miller, J.S. Herrick. Consequences of fuel load management on erosional processes in piñon-juniper ecosystems. US Department of Agriculture-Agriculture and Food Research Initiative, All Scientists Meeting. Annapolis, MD. June 2013.
- 27) **Barger, N.N.**, J.E. Herrick, J. Belnap, J. Van Zee. Hydrologic response of biologically crusted soils to disturbance and extreme climatic events: implications for ecosystem management. Second International Workshop on Biological Soil Crusts: Biological Soil Crusts in a Changing World. Madrid, Spain. June 2013.
- 26) **Barger N.N.**, H.S. Guenther, M.E. Miller, J.S. Herrick. Consequences of fuel load management on erosional processes in piñon-juniper ecosystems. Canyonlands Research Center Science and Management Advisory Board. Moab, UT. May 2013. Invited. *
- 25) Hoskinson, A.M., **N.N. Barger**, and A.P. Martin. Ready to flip your classroom? Three recommendations. CU Science Education Initiative and Center for STEM Learning End of the Year Event. May 2013. Invited.

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- 24) **Barger, N.N.**, H.S. Guenther, M.E. Miller, J.E. Herrick. Consequences of fuel load management on erosional processes in piñon-juniper ecosystems. 97th Annual Meeting Ecological Society of America. Portland, OR. August 2012. Invited.
- 23) Redmond, M.D., F. Forcella and **N.N. Barger**. Declines in pinyon pine cone production associated with regional warming. 97th Annual Meeting Ecological Society of America. Portland, OR. August 2012.
- 22) Zelikova, T.J., **N.N. Barger**, and S.C. Reed. Livestock grazing on the Colorado Plateau: Impacts on above and belowground carbon stocks. 97th Annual Meeting Ecological Society of America. Portland, OR. August 2012.
- 21) Guenther, H.S. and **N.N. Barger**. Fuel reduction effects on plant communities in an upland piñon-juniper woodland. Canyon Country Science Symposium. Moab, UT. March 2012. *
- 20) Redmond, M.D., and **N.N. Barger**. The influence of climate on annual variations in cone production among pinyon pine. Canyon Country Science Symposium. Moab, UT. March 2012.*
- 19) Zelikova, T.J., **N.N. Barger**, and S.C. Reed. Livestock grazing on the Colorado Plateau: Impacts on above and belowground carbon stocks. Canyon Country Science Symposium. Moab, UT. March 2012.
- 18) Belnap, J., B. Wilcox, **N.N. Barger**, J. Herrick, and M. van Soyoc. Biological soil crusts influence hydrologic function differently in various deserts and future climate and land use will affect these relationships, European Geophysical Union, Vienna, Austria. March 2012.
- 17) **Barger, N.N.**, H.S. Guenther, M.E. Miller, J.S. Herrick. Plant and soil responses to fuels reduction treatments in upland pinyon-juniper woodlands. Presented to Utah Partners for Conservation and Development. Green River, UT. February 2012.*
- 16) **Barger, N.N.**, H.S. Guenther, M.E. Miller, J.S. Herrick. Fire mitigation practices in piñon-juniper woodlands: Soil erosion increases related to declines in biological soil crust communities. Colorado Plateau 11th Biennial Conference. Flagstaff, AZ. October 2011. Invited.
- 15) **Barger, N.N.**, H.S. Guenther, M.E. Miller, J.S. Herrick. Soil erosion increases in response to fuels reduction in a piñon-juniper woodland. Ecological Society of America meetings. Austin, TX. August 2011.
- 14) **Barger, N.N.**, H.S. Guenther, M.E. Miller, J.S. Herrick. Science to support decision-making in pinyon-juniper fuels reduction treatments. Utah Bureau of Land Management Prescribed Fires and Fuels Workshop. Moab, Utah. April 2011. Invited. *
- 13) Hoenigman, R., E. Bradley, and **N.N. Barger**. An agent-based framework for designing water efficient residential landscapes, SIAM Conference on Applications of Dynamical Systems (DS11), Snowbird, Utah, 2011.

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- 12) **Barger N.N.** and S.C Castle. Towards a better understanding of nitrogen loss pathways in desert ecosystems: Denitrification from biologically crusted soils. First International Workshop on Biological Soils Crusts in Ecosystems: Their Diversity, Ecology, and Management.' Retzbach-Zellingen, Germany. August 2010. Invited.
 - 11) **Barger N.N.**, M.E. Miller, J.S. Herrick, S. Castle, M. Ross, and J. Morton. Promoting science-based decisions for restoration of pinyon-juniper woodlands. US Department of Agriculture-National Research Initiative All Scientists Meeting. Pittsburgh, PA. November 2009. Invited.
 - 10) **Barger, N.N.** Spoke to the CU chapter of the Roosevelt Institute about balancing science and management in managing western US ecosystems. November 2009. Invited.
 - 9) **Barger, N.N.** An overview of the impacts of woody encroachment on ecosystem C dynamics. North American Carbon Program (NACP) Disturbance Synthesis Workshop, Hosted by the US Geological Survey, Reston, VA. October 2009. Invited.
 - 8) **Barger, N.N.** and C. Woodhouse. Changes in pinyon pine growth in southern Utah over the last century. Colorado Plateau 10th Biennial Conference. Flagstaff, AZ. October 2009. Invited.
 - 7) **Barger, N.N.** Nitrogen cycling in biological soil crusts of the Colorado Plateau. Botany Department, University of Cape Town, Cape Town, South Africa. August 2009. Invited.
 - 6) **Barger, N.N.** Understanding the ecological costs and benefits of fuels reduction strategies in pinyon-juniper woodlands on the Colorado Plateau. Utah Bureau of Land Management Prescribed Fires and Fuels Workshop. Salt Lake City, February 2009. Invited.*
 - 5) Duniway, M.C., J.E. Herrick, K.E. Spaeth, **N.N. Barger**, J.W. Van Zee, J. Belnap. Multiscale variability of soil aggregate stability: Implications for rangeland hydrology and erosion. Society for Range Management Annual Meeting. Albuquerque, NM. November 2009.
 - 4) **Barger, N.N.**, C. Huang, J.C. Neff, D. Fernandez, G.P. Asner. Carbon storage in Colorado Plateau pinyon-juniper ecosystems. 2nd North American Carbon Program Investigators Meeting. San Diego, CA. February 2009. Invited.
 - 3) **Barger, N.N.**, C. Woodhouse, and H. Adams. The role of land use and climate in pinyon pine recruitment and growth. Colorado Plateau 9th Biennial Conference. Flagstaff, AZ. October 2007. Invited.
 - 2) **Barger, N.N.** Understanding the role of climate and land use in pinyon-juniper woodland expansion in the West. Department of Biological Sciences, University of Northern Colorado. September 2007. Invited.
 - 1) **Barger, N.N.**, C. Woodhouse, and H. Adams. Pinyon-juniper woodland dynamics: The role of climate and land use in tree recruitment and growth. Ecological Society of America meetings. San Jose, CA. August 2007.