



Nichole Barger is a Professor in the Department of Ecology and Evolutionary Biology at the University of Colorado at Boulder in the United States. Barger received her Master's degree from the University of California at Berkeley and holds a Ph.D. from Colorado State University. Barger works as an ecologist to support sustainable land management and restoration of a broad variety of ecosystems throughout the world.

Barger was a coordinating lead author on the IPBES global land degradation and restoration assessment. She is also the Research Director of Canyonlands Research Center in southeastern Utah. In her research program, Barger works in partnership with diverse governmental entities in the U.S. on land degradation and restoration issues such as the ecological risks of fire mitigation treatments, historical drivers and biogeochemical responses to woody plant encroachment, forest decline and regeneration, and more recently restoration of degraded dryland ecosystems with a specific focus on soil ecology.

Barger also has extensive research experience working on conservation and management issues in dryland ecosystems across the globe. She has worked with international research teams in the semi-arid grasslands of Inner Mongolia and anthropogenic grassland ecosystems of Venezuela, in addition to work in southern Africa on plant invasions in the biodiversity hot spot of the Cape Floristic region of South Africa and vegetation dynamics of the Namib Desert of Namibia.

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

PEER REVIEWED PUBLICATIONS (LAST 5 YEARS)

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. Accepted. The pervasive and multifaceted influence of biocrusts on water in the world's drylands. *Global Change Biology*.

Velasco Ayuso, S., A. Giraldo-Silva, **N.N. Barger** and F. Garcia-Pichel. 2020. Microbial inoculum production for biocrust restoration: testing the effects of a common substrate versus native soils on yield and community composition. *Restoration Ecology*
<https://doi.org/10.1111/rec.13127>.

Willemsen, 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. 2020. How to halt the global decline of land. *Nature Sustainability* <https://doi.org/10.1038/s41893-020-0477-x>.

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**. 2020. 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>.

Antoninka, A., 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>.

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>.

Fick, S.E., 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>.

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

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

Fick, S.E., **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>

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

Bethany, J.A. Giraldo-Silva, C. Nelson, **N.N. Barger**, and F. Garcia-Pichel. 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

Fick, S.E., **N.N. Barger**, M.C. Duniway. 2019. Hydrologic function of rapidly induced biocrusts. *Ecohydrology*. <https://doi.org/10.1002/eco.2089>.

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>.

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>

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>

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>

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>

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., Rodrigues, 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).

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).

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.

Havrilla, C.A., A.M. Faist, 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>

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

Faist, A., 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

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

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)

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)

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

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

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

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

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.

REPORTS

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.

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.