

## NICHOLE N. BARGER

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### PROFESSIONAL PREPARATION

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

### RESEARCH INTERESTS

My research mission is to better understand the impacts of changing climate and land use on plant communities and soil resources in dryland ecosystems; this research crosses the boundaries of community, ecosystem, and landscape ecology.

### PROFESSIONAL EXPERIENCE

- 2007-Present **Assistant Professor.** Department of Ecology and Evolutionary Biology.
- Spring 2007 **Instructor.** University of Colorado, Environmental Studies Program, Critical Thinking-Public Lands.
- 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.** Dept. of Environmental Science Policy and Management-Graduate Group in Range Science, University of California-Berkeley.
- 1995-96 **Lab technician.** University of California-Berkeley.
- 1994 **Research assistant.** NSF Arthropods of La Selva (ALAS) project. La Selva Biological Research Station, Costa Rica.

### RECOGNITION AND AWARDS

- 2003-2006 National Parks Ecological Research Fellowship, \$120,000

2002	Best Graduate Student Poster, Front Range Student Ecology Symposium
2000-2003	Canon National Parks Science Scholars Fellowship, \$60,000
1999-2000	Francis Clark Soil Biology Scholarship, Colorado State University, \$1500

## RESEARCH GRANTS

### Current and Previous Grants

2011-2013	Co-PI, NASA North American Carbon Program (NACP) Grant, Carbon management on public land in the Intermountain West: Multi-scale analysis of carbon stock responses to human and natural disturbance, \$570,000
2008-2012	Co-PI, Mellon Foundation, Nitrogen Inputs and Cycling in Ecosystems of the Western Cape Province of South Africa, \$293,000 total/\$107,000 to Barger
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 total/\$435,000 to Barger
2005-2008	Co-PI, NASA North American Carbon Program (NACP) Grant, Regional Carbon Storage Responses to Woody Encroachment in Western Pinyon-Juniper Systems, \$812,000 total/\$98,289 to Barger

### Pending Grants

2011	Collaborator, Innovative Digital Radiometer for Soil Moisture and Salinity Measurement, University of Colorado Innovative Seed Grant, \$49,904
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## PUBLICATIONS

◊ denotes undergraduate authors; † denotes graduate student authors

### *Manuscripts in review*

- 1) Ross, M. ◊, S.C Castle, and **N.N. Barger**. Recent fuels reduction treatment effects on herbaceous communities and soils in a pinyon-juniper ecosystem. *Journal of Arid Environments*.
- 2) Cho-ying Huang, G.P. Asner, and **N.N. Barger**. Regional Variation in Net Primary Production of Pinyon-Juniper Ecosystems. *Journal of Geophysical Research—Biogeosciences*.
- 3) **N.N. Barger**, S.R. Archer, J.L. Campbell, C. Huang, J.A. Morton † and A.K. Knapp. In press. Woody encroachment and the North American carbon budget. *Journal of Geophysical Research—Biogeosciences*.

**Peer-reviewed publications**

- 4) Castle, S.C., C.D. Morrison<sup>◇</sup> 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.
  
- 5) \*Grandy, S. and **N.N. Barger**. 2010. Implementing active learning strategies: Tales from two new life sciences professors at research universities. *Academic Leadership Online* Volume 8(2).  
\*Denotes equal contributions by the authors.
  
- 6) 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.
  
- 7) **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.
  
- 8) 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.
  
- 9) 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.
  
- 10) Hartley AE, **Barger NN**, Belnap J, Okin GS. 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.
  
- 11) **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.
  
- 12) **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.
  
- 13) Belnap, J., Welter, J.K., 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.
  
- 14) **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.

15) **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.

16) **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.

### ***Manuscripts in preparation***

Daniel P. Fernandez, Jason C. Neff, **Nichole B. Barger**, Cho-ying Huang, Gregory P. Asner, Twentieth century carbon stock changes related to Pinyon-Juniper expansion into a black sagebrush community

**Barger, N.N.** and C. Woodhouse. Evidence for tree growth declines related to changing climate in southern Utah.

†Guenther, H.S., **N.N. Barger**, N. Cobb, K. Ironside, M.E. Miller. Effects of past management treatments on vegetation structure and dynamics in pinyon-juniper woodlands at Grand Staircase-Escalante National Monument.

**Barger, N.N.** and S.C. Castle. Towards a better understanding of nitrogen loss pathways in desert ecosystems: Denitrification from biologically crusted soils.

### **PRESENTATIONS (*Since August 2007*)**

**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.

**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.

**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.

**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.

**Barger, N.N.** and C. Woodhouse. Changes in pinyon pine growth in southern Utah over the last century. Colorado Plateau 10<sup>th</sup> Biennial Conference. Flagstaff, AZ. October 2009. INVITED.

**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.

**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.

**Barger, N.N.,** C. Huang, J.C. Neff, D. Fernandez, G.P. Asner. Carbon storage in Colorado Plateau pinyon-juniper ecosystems. 2<sup>nd</sup> North American Carbon Program Investigators Meeting. San Diego, CA. February 2009. INVITED.

**Barger, N.N.,** C. Woodhouse, and H. Adams. The role of land use and climate in pinyon pine recruitment and growth. Colorado Plateau 9<sup>th</sup> Biennial Conference. Flagstaff, AZ. October 2007. INVITED.

**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.

**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.

### Principal Advising Activities

2010-present Tamara Jane Zelikova, Post-doctoral research associate, 2010-2012  
 2010-present Matt Peoples, EBIO Honors Project  
 2009-present Heidi Guenther, EBIO, M.S expected 2012  
 2009-present Taryn Morris, EBIO, Ph.D. expected 2014  
 2009-present Jeffery Morton, EBIO, Ph.D. expected 2014  
 Fall 2008 Kathryn Tenney, EBIO, MS student, Kathryn transferred to Environmental Engineering at the School of Mines  
 2007-2010 Matt Ross, EBIO Honors Program, Graduate Summa Cum Laude, May 2010

### Undergraduate Training

*IS = Independent study; URA = Undergraduate Research Assistant; UROP = Undergraduate Research Opportunities Award*

2010-present Matt Peoples (*UROP, URA*), EBIO/Education major, current  
 2010-present Drew Habis (*UROP, URA*), EBIO major, current  
 2008-present Conor Morrison, (*IS, URA*), EBIO major, current  
 2009-present Alisha Mercer (*URA*), EBIO major, current  
 Summer 2010 Ian Mallams (*URA*), ENVS major, current

2007-2010 Matt Ross, (*UROF, URA*), EBIO major  
 2009-2010 Nikolas Mirhashemi (*URA*), EBIO major, 2009-2010  
 2009-2010 Laura Schaffenacker (*URA*), ENVS major, 2009-2010  
 2009-2010 Lewis Osterman (*URA*), EBIO major, 2009-2010  
 Summer 2009 Cody Flagg (*URA*), EBIO major, 2009  
 2008-2009 Amanda Ochs (*URA*), English major/EBIO minor, 2008-2009  
 2008-2009 Tegan McGillivrey (*URA*), EBIO/Anthropology major, 2008-2009

### **Graduate and Honors Student Committee Membership**

2009-present Janet Prevey, Ph.D EBIO  
 2008-present Chris Gray, Ph.D. EBIO  
 2008-present Rhonda Hoenigman, Ph.D., Computer Science  
 2008-2010 Charlie Lawton, M.S. EBIO  
 2007-2008 Blake Angelo, Honors EBIO  
 2007-2008 Sarah Castle, M.S. Geological Sciences

## **SERVICE ACTIVITIES**

### **Service to the University of Colorado**

2010-2011 EBIO Executive Committee  
 2010 EBIO Budget Committee  
 2009 EBIO Merit Evaluation Committee  
 2009 Film festival juror for film course (Atlas 3519), December 2009  
 2008 LEAP Workshop on balancing career goals and family life, December 2008  
 2008-2009 EBIO Graduate Committee  
 2007-2008 EBIO Undergraduate Curriculum Committee  
 2008 EBIO Gordon Alexander Fellowship selection committee

### **Service Outside of the University of Colorado**

March 2011 EPA Science To Achieve Results (STAR) Graduate Student Fellowship Panel.  
 2009-present Science and Management Advisory Council Member, Canyonlands Research Center, The Nature Conservancy, Moab, Utah  
 2009-present Friends of Boulder Open Space Science Advisory Group. Boulder, CO  
 2009-present North American Carbon Program (NACP) working group lead to assess the impacts of woody encroachment on carbon storage across North America

### **Reviewer and Editorial Activities**

2010-2011 Ad-hoc Associate Editor for Ecological Applications

2007-present Manuscript reviews for Arctic, Antarctic, and Alpine Research (AAAR); Ecological Applications; Eos; Ecosystems; Environmental Management; Functional Ecology; Journal of Arid Environments; Journal of Geophysical Research-Biogeosciences; Journal of Ecology; Hydrological Processes; Oecologia; Restoration Ecology, Rangeland Ecology and Management

2007-present Proposal reviews for NSF Division of Environmental Biology, European Union Polar Climate Programme, US-Israel Binational Science Foundation

### ***Professional Affiliations***

2000-present Society for Range Management

1999-present American Geophysical Union

1994-present Ecological Society of America

### **OUTREACH ACTIVITIES**

2009 Denver Museum of Nature and Science, Climate Change Workshop for 4<sup>th</sup> and 8<sup>th</sup> grade teachers. Presentation titled 'Climate Change in the Classroom.' INVITED.

2007 Denver Botanic Garden, Café Botanique. Public talk titled 'A century of crust busting on the Colorado Plateau.' INVITED.