

William K. Lauenroth

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Professor
School of Forestry and Environmental Studies
Yale University

Academic Training

Degree	Year	Institution	Major
B.S.	1968	Humboldt State University	Range Management
M.S.	1970	North Dakota State University	Botany
Ph.D.	1973	Colorado State University	Ecosystem Ecology

Positions

1973-1981	Research Ecologist, Natural Resource Ecology Laboratory, Colorado State University, Fort Collins
1981-1987	Associate Professor, Department of Range Science, Colorado State University, Fort Collins
1987-2008	Professor & co-Director, Graduate Degree Program in Ecology & Department of Forest, Rangeland, and Watershed Stewardship, Colorado State University, Fort Collins
2008-2016	Professor, Department of Botany, University of Wyoming, Laramie
2016-	Professor, School of Forestry and Environmental Studies, Yale University, New Haven

Professional and Honorary Societies

Ecological Society of America
American Association for the Advancement of Science
American Geophysical Union

Awards

Fellow, Ecological Society of America, 2017
Fellow, American Association for the Advancement of Science, 2005
Highly Cited Researcher - Original Member, Institute for Scientific Information, 2002
E. J. Dyksterhuis Distinguished Lecturer, Texas A & M University, 1998
Outstanding Achievement Award, Society for Range Management, 1989

Editorial Boards

Journal of Range Management 1983-1987
Ecological Modelling 1982-1986
Vegetatio 1990-1996
Plant Ecology 1997-2000
Oecologia 1998-2001
Journal of Ecology 1999-2004
Ecology & Ecological Monographs 2001-2003
Western North American Naturalist 2015-
Rangeland Ecology & Management 2018-

Doctoral Students Mentored - Graduation Date

Adler, Peter B. - 2003
Aguiar, Martin R. - 2000
Aguilera, Manuel O. - 1992
Bicak, Charles J. - 1984
Bradford, John B. - 2004
Byrne, Kerry. M. - 2012
Dodd, Michael B. - 1997
Dougherty, Robert L. - 1986
Fan, Weihong - 1993
Hook, Paul B. - 1992
Humphries, Hope C. - 1993
Lkhagva Ariuntsetseg - 2013
Milchunas, Daniel G. - 1991
Moore, L. M. - 2014
Munson, Seth - 2009
Paruelo, Jose M. - 1995
Peters (Coffin), Debra P. - 1988
Sala, Osvaldo E. - 1982
Zimmerman, Gregory M. - 1987

PUBLICATIONS
[Google Scholar h-index=90](#)

Journal Articles

- Jordan, S. E., K. P. Palmquist, J. B. Bradford, and W. K. Lauenroth. Soil water availability shapes species richness in mid-latitude shrub steppe plant communities. (Being revised for Journal of Vegetation Ecology)
- Bradford JB, Schlaepfer DR, Lauenroth WK, Palmquist KA, Chambers JC, Maestas JD and Campbell SB. 2019. Climate-Driven Shifts in Soil Temperature and Moisture Regimes Suggest Opportunities to Enhance Assessments of Dryland Resilience and Resistance. *Frontiers of Ecology & Evolution* 7:358. doi: 10.3389/fevo.2019.00358
- Renne, R. R., J. B. Bradford, I. C. Burke, and W. K. Lauenroth. 2019. Soil texture and precipitation seasonality influence plant community structure in temperate shrublands of western North America. *Ecology* DOI: 10.1002/ecy.2824
- Renne, R. R., D. R. Schlaepfer, K. A. Palmquist, J. B. Bradford, I. C. Burke, and W. K. Lauenroth. 2019. Soil and stand characteristics explain patterns of shrub mortality following global change type-drought and extreme precipitation. *Ecology* 100 DOI: 10.1002/ecy.2889
- Swindon, J. G., I. C. Burke, and W. K. Lauenroth. 2019. Seasonal patterns of root production with water and nitrogen additions across three dryland ecosystems. *Ecosystems* 22:1664-1675.
- Swindon, J. G., I. C. Burke, D. R. Schlaepfer, and W. K. Lauenroth. 2019. Spatial distribution of roots across three dryland ecosystems and plant functional types. *Western North American Naturalist* 79:159-169.
- Lindquist, L.W., K.A. Palmquist, S.E. Jordan, and W.K. Lauenroth. 2019. Impacts of climate change on groundwater recharge in Wyoming big sagebrush ecosystems are contingent on elevation. *Western North American Naturalist* 79:37–48.
- Pennington, V. E., K. A. Palmquist, J. B. Bradford, and W. K. Lauenroth. 2019. Patterns of Big Sagebrush Plant Community Composition and Stand Structure in the Western US. *Journal of Rangeland Ecology and Management* 72:505-514.
- Palmquist, KP, JB Bradford, TE Martyn, DR Schlaepfer, and WK Lauenroth. 2018. STEPWAT2- an individual-based model for exploring the impact of climate and disturbance on dryland plant communities. *Ecosphere* 9 (8).
- Wilson, S.D., Daniel R Schlaepfer, John B Bradford, William K Lauenroth, Michael C Duniway, Sonia A Hall, Khishigbayar Jamiyansharav, Gensuo Jia, Ariuntsetseg Lkhagva, Seth M Munson, David A Pyke, Britta Tietjen. 2018. Functional group, biomass, and climate change effects on ecological drought in semiarid grasslands. *Journal of Geophysical Research: Biogeosciences* 123: 1072-1085.
- Rottler, C. M., I. C. Burke, K. A. Palmquist, J. B. Bradford, and W. K. Lauenroth. 2018. Current reclamation practices after oil and gas development do not speed up succession or plant community recovery in big sagebrush ecosystems in Wyoming. *Restoration Ecology* 26:114-123. doi: 10.1111/rec.12543
- Bradford, J. B., D. R. Schlaepfer, W. K. Lauenroth, C. B. Yackulic, M. Duniway, S. Hall, G. Jia, K. Jamiyansharav, S. M. Munson, S. D. Wilson & B. Tietjen. 2017. Future soil moisture and temperature extremes imply expanding suitability for rainfed agriculture in temperate drylands. *Scientific Reports* 7 (1), 12923. doi:10.1038/s41598-017-13165-x

- Pennington, V. E., K. A. Palmquist, J. B. Bradford, and W. K. Lauenroth. 2017. Climate and Soil Texture Influence Patterns of Forb Species Richness and Composition in Big Sagebrush Plant Communities Across their Spatial Extent in the Western US. *Plant Ecology* 218: 957-970.
- Moore L. M. and W. K. Lauenroth. 2017. Differential effects of temperature and precipitation on early versus late flowering species. *Ecosphere* 8 (5).
- Petrie, M. D., J. B. Bradford, R. M. Hubbard, W. K. Lauenroth, C. M. Andrews, D. R. Schlaepfer. 2017. Climate change will restrict dryland forest regeneration in the 21st century. *Ecology* 98: 1548-1559.
- Tietjen, B, Schlaepfer, DR, Bradford, JB, Lauenroth, WK, Hall, S, Duniway, M, Hochstrasser, T., Jia, GS, Munson, S, Pyke, D, Wilson, S. 2017. Climate change-induced vegetation shifts lead to more ecological droughts despite projected rainfall increases in many global temperate drylands. *Global Change Biology* 23: 2743-2754.
- Byrne, KM, Adler, PA, and Lauenroth, WK. 2017. Contrasting effects of precipitation manipulations on plant communities at two Great Plains, USA sites. *Journal of Vegetation Science* 28: 238-249.
- Schlaepfer, DR, Bradford, JB, Lauenroth, WK, Munson, S, B Tietjen, Hall, S, Wilson, S, Duniway, Jia, GS, M, Pyke, DA, Lkhagva, A, Jamiyansharav, K. 2017. Climate change reduces extent of temperate drylands and intensifies drought in deep soils. *Nature Communications* 8, 14196. doi:10.1038/ncomms14196
- Palmquist, KP, DR Schlaepfer, JB Bradford, and WK Lauenroth. 2016. Spatial and ecological variation in dryland ecohydrological responses to climate change- implications for management. *Ecosphere* 7 (11)
- Moore L. and W. K. Lauenroth. 2016. Twelve years of high resolution near surface radiometer data provides insight into end of season controls in a dry grassland. *Western North American Naturalist* 76:143-162.
- Martyn, Trace E, William K Lauenroth, John B Bradford, Daniel R Schlaepfer. 2016. Seed bank and existing plant community mismatch: Potential impacts on climate change induced species range shifts. *Ecosphere* 7 (10).
- Pennington, V. E., J. B. Bradford, D. R. Schlaepfer, J. L. Beck, K. A. Palmquist, and W. K. Lauenroth. 2016. Sagebrush, Greater Sage-Grouse, and the Occurrence and Importance of Forbs. *Western North American Naturalist* 76:298-312.
- Palmquist, K. A., W. K. Lauenroth, D. R. Schlaepfer, and J. B. Bradford. 2016. Mid-latitude shrub steppe plant communities: Climate change consequences for soil water resources. *Ecology* 97:2342-2354.
- Petrie, M. D., A. M. Wildeman, John B. Bradford, R. M. Hubbard, W. K. Lauenroth. 2016. A review of precipitation and temperature control on seedling emergence and establishment for ponderosa and lodgepole pine forest regeneration. *Forest Ecology and Management* 361:328-338.
- Martyn et al. 2015. Daubenmire Versus Line-Point Intercept- A Response to Thacker et al. (2015). *Rangelands* 37:158-160.
- Moore L., W. K. Lauenroth, D. M. Bell, D. R. Schlaepfer. 2015. Soil water and temperature explain canopy phenology and onset of spring in a semiarid steppe. *Great Plains Research* 25:121-138.
- Bell, D.M., J.B. Bradford, W.K. Lauenroth. 2015. Scale-dependence of disease impacts on quaking aspen (*Populus tremuloides*) mortality risk in the southwestern U. S. *Ecology*

96: 1835-1845.

- Schlaepfer, D. R., Taylor, K., V. E. Pennington, K. N. Nelson, T. E. Martyn, C. M. Rottler, W. K. Lauenroth, and J. B. Bradford. 2015. Simulated big sagebrush regeneration supports predicted changes at the trailing and leading edges of distribution shifts. *Ecosphere* 6: Art3.
- Avirmed, O. I. C. Burke, M. I. Mobley, W. K. Lauenroth. 2014. Sagebrush steppe recovery on 30–90-year-old abandoned oil and gas wells. *Ecosphere* 6Art116.
- Newbold, T. A. Scott, P. Stapp, K. E. Levensailor, J. D. Derner, and W. K. Lauenroth. 2014. Community Responses of Arthropods to a Range of Traditional and Manipulated Grazing in Shortgrass Steppe. *Environmental Entomology* 43: 556-568
- Bell, D.M., J.B. Bradford, W.K. Lauenroth. 2014. Mountain landscapes offer few opportunities for high elevation tree species migration. *Global Change Biology* 20:1441-1451.
- Bell, D.M., J.B. Bradford, W.K. Lauenroth. 2014. Forest stand structure, productivity, and age mediate climatic effects on aspen decline. *Ecology* 95: 2040-2046.
- Bell, D.M., J.B. Bradford, W.K. Lauenroth. 2014. Early indicators of change- divergent climate envelopes between tree life stages imply range shifts in the western United States. *Global Ecology and Biogeography* 23: 168-180.
- Schlaepfer, D. R., W. K. Lauenroth, and J. B. Bradford. 2014. Modeling regeneration responses of big sagebrush (*Artemisia tridentata*) to abiotic conditions. *Ecological Modelling* 286:66-77.
- Schlaepfer, D. R., W. K. Lauenroth, and J. B. Bradford. 2014. Natural Regeneration Processes in Big Sagebrush (*Artemisia tridentata*). *Rangeland Ecology and Management* 67: 344-357.
- Lauenroth, W. K., D. R. Schlaepfer, and J. B. Bradford. 2014. Ecohydrology of dry regions of the United States: Storage versus pulse soil water dynamics. *Ecosystems* 17: 1469-1479.
- Bradford, J. B., D. R. Schlaepfer, W. K. Lauenroth, I. C. Burke. 2014. Shifts in plant functional types have time-dependent and regionally variable impacts on dryland ecosystem water balance. *Journal of Ecology* 102: 1408-1418.
- Bradford, J. B., D. R. Schlaepfer, W. K. Lauenroth. 2014. Ecohydrology of adjacent sagebrush and lodgepole pine ecosystems: the consequences of climate change and disturbance. *Ecosystems* 17:590-605.
- Avirmed, O. I. C. Burke, M. I. Mobley, W. K. Lauenroth, and D. R. Schlaepfer. 2014. Natural recovery of soil organic matter in 30–90-year-old abandoned oil and gas wells in sagebrush steppe. *Ecosphere* 5:art24.
- Schlaepfer, D. R., B. E. Ewers, B. N. Shuman, D. G. Williams, J. M. Frank, W. J. Massman, and W. K. Lauenroth. 2014. Terrestrial water fluxes dominated by transpiration: Comment Arising from S. Jasechko et al. *Nature* 496, 347-351 (2013). *Ecosphere* 5:art61.
- Chu, C., K. M. Havstad, N. Kaplan, W. K. Lauenroth, M. P. McClaran, D. P. Peters, L. T. Vermeire & P. B. Adler. 2014. Life form influences survivorship patterns for 109 herbaceous perennials from six semi-arid ecosystems. *Journal of Vegetation Science* 25:947-954.
- Byrne, K. M., W. K. Lauenroth, P. B. Adler. 2013. Contrasting Effects of Precipitation Manipulations on Production in Two Sites within the Central Grassland Region, USA. *Ecosystems* 16: 1039-1051.

- Lkhagva, A., B. Boldgiv, C. E. Goulden, O. Yadamsuren, and W. K. Lauenroth. 2013. Effects of grazing on plant community structure and aboveground net primary production of semiarid boreal steppe of northern Mongolia. *Grassland Science* 59:135-145. doi: 10.1111/grs.12022
- Chu, Chengjin, J. Norman, R. Flynn, N. Kaplan, W. K. Lauenroth, and P. B. Adler. 2013. Cover, density, and demographics of shortgrass steppe plants mapped 1997–2010 in permanent grazed and ungrazed quadrats. *Ecology* 94: 1435.
- Burke, I. C., E. E. Bontti, J. E. Barrett, P. N. Lowe, W. K. Lauenroth and R. Riggle. 2013. Impact of labile and recalcitrant carbon treatments on available nitrogen and plant communities in a semiarid ecosystem. *Ecological Applications* 23: 537-545.
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- Schlaepfer, D. R., W. K. Lauenroth and J. B. Bradford. 2012. Consequences of declining snow accumulation for water balance of mid-latitude dry regions. *Global Change Biology* 18: 1988-1997. DOI: 10.1111/j.1365-2486.2012.02642.x
- Munson, S. M., W. K. Lauenroth, I. C. Burke. 2012. Soil Carbon and Nitrogen Recovery on Semiarid Conservation Reserve Program Lands. *Journal of Arid Environments* 79: 25-31. doi:10.1016/j.jaridenv.2011.11.027
- Schlaepfer, D. R., W. K. Lauenroth and J. B. Bradford. 2012. Ecohydrological niche of sagebrush ecosystems. *Ecohydrology* 5: 453-466.
- Munson, S. M. and W. K. Lauenroth. 2011. Plant Community Recovery Following Restoration in Semiarid Grasslands. *Restoration Ecology* 20: 656-663. DOI: 10.1111/j.1526-100X.2011.00808.x
- Schlaepfer, D. R., W. K. Lauenroth and J. B. Bradford. 2012. Effects of ecohydrological variables on current and future ranges, local suitability patterns, and model accuracy in big sagebrush. *Ecography* 35: 374-384. doi: 10.1111/j.1600-0587.2011.06928.x.
- Bermejo, L. A., Silvia Fernandez-Lugo, Lea de Nascimento & William K. Lauenroth. 2011. Gestion del pastoreo para la conservacion de la avifauna. podria aplicarse en Canarias? *Boletín de la Real Sociedad Economica de Amigos del Pais de Tenerife* 303-325.
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- Evans, S. E., K. M. Byrne, W. K. Lauenroth, and I. C. Burke. 2011. Defining the limit to resistance in a drought-tolerant grassland: long-term severe drought significantly reduces the dominant species and increases ruderals. *Journal of Ecology* 99: 1500-1507.
- Lauenroth, W. K. and J. B. Bradford. 2011. Ecohydrology of dry regions of the United States: Water balance consequences of small precipitation events. *Ecohydrology* 5:46-53. DOI-10.1002/eco.195
- Evans, S. E., I. C. Burke, W. K. Lauenroth, Z. Guangsheng. 2011. Controls on soil organic carbon and nitrogen in Inner Mongolia, China: a cross-continental comparison of

- temperate grasslands. *Global Biogeochemical Cycles* 25, GB3006, doi:10.1029/2010GB003945.
- Sasaki, T. and W. K. Lauenroth. 2011. Dominant species, rather than diversity, regulates temporal stability of plant communities. *Oecologia* 166: 761-768.
- Byrne, K. M., W. K. Lauenroth, and L. N. Davis. 2010. Non-native plant species impacts on production and diversity in the front range of Colorado. *Western North American Naturalist* 70: 288-295.
- Hwang, B. C., and W. K. Lauenroth. 2010. Effect of nitrogen, water, and neighbor presence on the growth of *Hesperis matronalis* in a natural community. *American Midland Naturalist* 163: 212-219.
- Munson, S. M., T. J. Benton, W. K. Lauenroth, and I. C. Burke. 2010. Soil carbon flux following pulse precipitation events in the shortgrass steppe. *Ecological Research* 25: 205-211. DOI: 10.1007/s11284-009-0651-0
- Lauenroth, W. K. and J. B. Bradford. 2009. Ecohydrology of dry regions of the United States: Precipitation pulses and intraseasonal drought. *Ecohydrology* 2 173-181.
- Burke, I. C. and W. K. Lauenroth. 2009. Environmentalist label not in our best interest. *Frontiers in Ecology and the Environment* 7:240.
- White, M. A., Kirsten M. de Beurs, Kamel Didan, David W. Inouye, Andrew D. Richardson, Olaf P. Jensen, John O'Keefe, Gong Zhang, Ramakrishna R. Nemani, Willem, J.D. van Leeuwen, Jesslyn F. Brown, Allard de Wit, Michael Schaeppman, Xioamao Lin, Michael Dettinger, Amey S. Bailey, John Kimball, Mark D. Schwartz, Dennis D. Baldocchi, John T. Lee, William K. Lauenroth. 2009. Intercomparison, interpretation, and assessment of spring phenology in North America estimated from remote sensing for 1982 to 2006. *Global Change Biology* 15: 2335-2359. doi: 10.1111/j.1365-2486.2009.01910.x
- Lauenroth, W. K., R. L. Dougherty, and J. S. Singh. 2009. Precipitation event size controls on long-term abundance of *Opuntia polyacantha* in Great Plains grasslands. *Great Plains Research* 19: 55-64.
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- McCulley, R. L., I. C. Burke, and W. K. Lauenroth. 2009. Conservation of nitrogen increases with precipitation across a major grassland gradient in the central Great Plains of North America. *Oecologia* 159: 571-581.
- Munson, S. M. and W. K. Lauenroth. 2009. Plant population and community responses to removal of the dominant species. *Journal of Vegetation Science* 20: 1-9.
- Adair, E. C., I. C. Burke, and W. K. Lauenroth. 2008. Contrasting effects of resource availability and plant mortality on plant community invasion by *Bromus tectorum* L. *Plant and Soil* 304:103-115.
- Lauenroth, W. K. and P. B. Adler. 2008. Demography of grassland plants: Survival, life expectancy, and lifespan. *Journal of Ecology* 96:1023-1032.
- Cleland, E. E., C. M. Clark, S. L. Collins, J. E. Fargione, L. Gough, K. L. Gross, D. G. Milchunas, S. C. Pennings, W. D. Bowman, I. C. Burke, W. K. Lauenroth, G. P. Robertson, J. C. Simpson, D. Tilman, and K. N. Suding. 2008. Species responses to nitrogen fertilization in herbaceous plant communities, and associated species traits. *Ecology* 89: 1175.
- Hwang, B. C., and W. K. Lauenroth. 2008. Effect of nitrogen, water and neighbor density on

- the growth of *Hesperis matronalis* and two native perennials. *Biological Invasions* 10:771-779.
- Oyarzabal, M., J. M. Paruelo, F. Del Pino, M. Oesterheld, and W. K. Lauenroth. 2008. Trait differences between grass species along a climatic gradient in South and North America. *Journal of Vegetation Science* 19:183-192.
- Adler, P.B., W. R. Tyburcz, and W. K. Lauenroth. 2007. Long-term mapped quadrats from Kansas prairie: A unique source of demographic information for herbaceous plants. *Ecology* 88: 2673.
- Wells, F. H. and W. K. Lauenroth. 2007. The potential for horses to disperse alien plants along recreational trails. *Rangeland Ecology and Management* 60:574-577.
- Bradford, J. B. and W. K. Lauenroth. 2006. Controls over invasion of *Bromus tectorum*: The importance of climate, soil, disturbance, and seed availability. *Journal of Vegetation Science* 17: 693-704.
- Lauenroth, W. K., A. A. Wade, M. A. Williamson, B. Ross, S. Kumar, and D. P. Cariveau. 2006. Uncertainty in calculations of net primary production for grasslands. *Ecosystems* 9:843-851.
- Lauenroth, W. K. and J. B. Bradford. 2006. Ecohydrology and the partitioning AET between transpiration and evaporation in a semiarid steppe. *Ecosystems* 9:756-767.
- Bradford, J. B., W. K. Lauenroth, I. C. Burke, and J. M. Paruelo. 2006. The influence of climate, soils, weather, and land use on primary production and biomass seasonality in the US Great Plains. *Ecosystems* 9: 934-950.
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- Bradford, J. B., J. A. Hicke, and W. K. Lauenroth. 2005. The relative importance of light-use efficiency modifications from environmental conditions and cultivation for estimation of large-scale net primary production. *Remote Sensing of Environment* 96:246-255.
- Bradford, J. B., W. K. Lauenroth, and I. C. Burke. 2005. The impact of cropping on primary production in the U. S. Great Plains. *Ecology* 86:1863-1872.
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- Lauenroth W.K., Epstein H.E., Paruelo J.M., Burke I.C., Aguiar M.R., Sala O.E. 2004. Potential effects of climate change on the temperate zones of North and South America. *Revista Chilena De Historia Natural* 77: 439-453.
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- USA. *Oecologia* 141: 269–281.
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- Murphy, K.L., I. C. Burke, M.A. Vinton, W.K. Lauenroth, M.R. Aguiar, D.A. Wedin, R.A. Virginia, and P. Lowe. 2002. Regional analysis of litter quality in the central grassland region of North America. *Journal of Vegetation Science* 13:395-402.
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