

# Katharine Nash Suding

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## Education

University of Michigan	PhD, Ecology, Evolution, and Organismal Biology	1999
Williams College	BS, with highest honors in Biology	1994

## Academic Appointments

2020-	Distinguished Professor, University of Colorado Boulder Collegiate Professor of Distinction, College of Arts and Sciences
2014-2020	Associate and Full Professor, Ecology and Evolutionary Biology Director, Niwot Ridge Long-term Ecological Program, Institute of Arctic and Alpine Research
2009-2014	University of California at Berkeley Associate Professor, Environmental Science, Policy and Management
2003-2009	University of California at Irvine Assistant and Associate Professor, Ecology and Evolutionary Biology

## Awards and Honors

2020	Fellow, Miller Institute for Basic Research in Science, UC Berkeley (deferred, TBD) Distinguished Professor, University of Colorado Collegiate Professor of Distinction, College of Arts and Sciences
2019	Fellow, American Association of the Advancement of Science (AAAS) Highly Cited Researcher, ISI Web of Science ( <i>top 1% of all authors in environmental science</i> ) Trailblazing Women in Conservation, Santa Barbara Botanical Gardens
2018	Robert MacArthur Award, Ecological Society of America ( <i>awarded bi-annually to the most promising ecologist worldwide within 20 years of their PhD</i> ) Excellence in Research, Scholarly and Creative Work, CU Boulder Faculty Assembly Highly Cited Researcher, ISI Web of Science
2017	Recent Advances Lecturer, Ecological Society of America Highly Cited Researcher, ISI Web of Science
2016	Fellow, Ecological Society of America Wilson Lecturer in Botany, Miami University Ohio Cross Distinguished Lecturer, University of Oklahoma
2014	Distinguished Research Group, ESPM, University of California at Berkeley
2008	University Distinguished Assistant Professor, University of California at Irvine
2005	Young Investigator Research Award, Andrew W. Mellon Foundation

- Promising Scientist in Natural Resources, University of Arizona
- 2002 Fellow, Centre National de la Recherche Scientifique France
- Publications** (177 publications, 2 co-edited books, h-index 55, i10-index 135, >17,000 citations<sup>1</sup>)
- Graduate or postdoc mentee co-author (+), Highly cited in WOS or >200 citations (o), undergrad authors underlined. In ecology, the last author position denotes senior authorship, often in conjunction with mentees as first authors.
- Avolio, M. L., Wilcox, K. R., Komatsu, K. J., Lemoine, N., Bowman, W. D., Collins, S. L., ... Yu, Q. (2020). Temporal variability in production is not consistently affected by global change drivers across herbaceous-dominated ecosystems. *OECOLOGIA*, 194(4), 735-744. doi:10.1007/s00442-020-04787-6
  - + Yang, Y., Klein, J. A., Winkler, D. E., Peng, A., Lazarus, B. E., Germino, M. J., J.G. Smith, K. Suding, Kueppers, L. M. (2020). Warming of alpine tundra enhances belowground production and shifts community towards resource acquisition traits. *ECOSPHERE*, 11(10), 15 pages. doi:10.1002/ecs2.3270
  - Walter, J. A., Hallett, L. M., Sheppard, L. W., Anderson, T. L., Zhao, L., Hobbs, R. J., K. Suding, Reuman, D. C. (2020). Micro-scale geography of synchrony in a serpentine plant community. *JOURNAL OF ECOLOGY*, 13 pages. doi:10.1111/1365-2745.13503
  - + Dudney, J., & Suding, K. N. (2020). The elusive search for tipping points. *NATURE ECOLOGY & EVOLUTION*, 4(11), 1449-1450. doi:10.1038/s41559-020-1273-8. Senior author.
  - + Bueno de Mesquita, C. P., Sartwell, S. A., Schmidt, S. K., & Suding, K. N. (2020). Growing-season length and soil microbes influence the performance of a generalist bunchgrass beyond its current range. *ECOLOGY*, 101(9), 13 pages. doi:10.1002/ecy.3095. Senior author.
  - Zhao, L., Wang, S., Hallett, L. M., Rypel, A. L., Sheppard, L. W., Castorani, M. C. N., K. Suding, Reuman, D. C. (2020). A new variance ratio metric to detect the timescale of compensatory dynamics. *ECOSPHERE*, 11(5), 16 pages. doi:10.1002/ecs2.3114
  - Thomas, H. J. D., Bjorkman, A. D., Myers-Smith, I. H., Elmendorf, S. C., Kattge, J., Diaz, S., . . . de Vries, F. T. (2020). Global plant trait relationships extend to the climatic extremes of the tundra biome. *NATURE COMMUNICATIONS*, 11(1), 12 pages. doi:10.1038/s41467-020-15014-4
  - + Farrer, E. C., Porazinska, D. L., Spasojevic, M.J., King, A.J., Bueno De Mesquita, C.P., Sartwell, S.A., Smith, J.G., White, C.T., Schmidt, S.K., & Suding, K.N. 2020. Soil microbial networks shift across a high-elevation successional gradient. *FRONTIERS IN MICROBIOLOGY*, in press. Senior author.
  - Thomas, H. J.D, Bjorkman, A. D., Myers-Smith, I. H., Elmendorf, S. C., Normand, S., Alatalo, J. M., Suding, K.N... Zamin. 2020. Global plant trait relationships extend to the climatic extremes of the tundra biome. *NATURE COMMUNICATIONS* 11: 1-12.
  - + Bueno de Mesquita, C. P., Brigham, L. M., Sommers, P., Porazinska, D. L., Farrer, E. C., Darcy, J. L., Suding, K.N., Schmidt, S. K. (2020). Evidence for phosphorus limitation in high-elevation unvegetated soils, Niwot Ridge, Colorado. *BIOGEOCHEMISTRY*, 147(1), 1-13. doi:10.1007/s10533-019-00624-y
  - + Bueno de Mesquita, C. P., Schmidt, S. K., & Suding, K.N. (2019). Litter-driven feedbacks influence plant colonization of a high elevation early successional ecosystem. *PLANT AND SOIL*, 444(1-2), 71-85. doi:10.1007/s11104-019-04242-3. Senior author.
  - + Hallett, L. M., Shoemaker, L. G., White, C. T., & Suding, K.N. (2019). Rainfall variability maintains grass-forb species coexistence. *ECOLOGY LETTERS*, 22(10), 1658-1667. doi:10.1111/ele.13341. Senior author.
  - + Grinath, J. B., Larios, L., Prugh, L. R., Brashares, J. S., & Suding, K.N. (2019). Environmental gradients determine the potential for ecosystem engineering effects. *OIKOS*, 128(7), 994-1004.

<sup>1</sup> Google Scholar, January 2019. h-index: h publications receiving that many citations. i10-index: number of publications receiving at least 10 citations.

- doi:10.1111/oik.05768. Senior author.
- Clark, C. M., Simkin, S. M., Allen, E. B., Bowman, W. D., Belnap, J., Brooks, M. L., Suding, K. N...Waller, D. M. (2019). Potential vulnerability of 348 herbaceous species to atmospheric deposition of nitrogen and sulfur in the United States. *NATURE PLANTS*, 5(7), 697-705. doi:10.1038/s41477-019-0442-8
- + de Mesquita, C. B., Schmidt, S. K. & Suding, K. N. (2019) Litter driven feedbacks influence plant colonization of a high elevation early successional ecosystem. *PLANT AND SOIL* <http://doi.org/10.1007/s11104-019-04242-3>. Senior author.
- Crawford, K. M., Bauer, J. T., Comita, L. S., Eppinga, M. B., Johnson, D. J., Mangan, S. A., Suding, K. N... Bever, J. D. (2019). When and where plant-soil feedback may promote plant coexistence: a meta-analysis. *ECOLOGY LETTERS*, 22(8), 1274-1284. doi:10.1111/ele.13278
- Prevéy, J. S., Rixen, C., Rüger, N., Høye, T. T., Bjorkman, A. D., Myers-Smith, I. H., Suding, K. N...Wipf, S. (2019). Author Correction: Warming shortens flowering seasons of tundra plant communities. *NATURE ECOLOGY AND EVOLUTION*, 3(4), 709. doi:10.1038/s41559-019-0859-5
- + Hernandez, E., Questad, E. J., Meyer, W. M., & Suding, K. N. (2019). The effects of nitrogen deposition and invasion on litter fuel quality and decomposition in a *Stipa pulchra* grassland. *JOURNAL OF ARID ENVIRONMENTS*, 162, 35-44. doi:10.1016/j.jaridenv.2018.11.003. Senior author.
  - + Wentz, K. F., Neff, J. C., & Suding, K. N. (2019). Leaf temperatures mediate alpine plant communities' response to a simulated extended summer. *ECOLOGY AND EVOLUTION*, 9(3), 1227-1243. doi:10.1002/ece3.4816. Senior author.
- Beller, E. E., Spotswood, E. N., Robinson, A. H., Anderson, M. G., Higgs, E. S., Hobbs, R. J., Suding, K.N., Grossinger, R. M. (2019). Building Ecological Resilience in Highly Modified Landscapes. *BIOSCIENCE*, 69(1), 80-92. doi:10.1093/biosci/biy117/
- Prevey, J. S., Rixen, C., Rueger, N., Hoye, T. T., Bjorkman, A. D., Myers-Smith, I. H., Suding, K. N... Wipf, S. (2019). Warming shortens flowering seasons of tundra plant communities. *NATURE ECOLOGY & EVOLUTION*, 3(1), 45-52. doi:10.1038/s41559-018-0745-6
- + de Mesquita, C. P. B., Sartwell, S. A., Ordemann, E. V., Porazinska, D. L., Farrer, E. C., King, A. J., Suding, K. N. & Schmidt, S. K. (2018). Patterns of root colonization by arbuscular mycorrhizal fungi and dark septate endophytes across a mostly-unvegetated, high-elevation landscape. *FUNGAL ECOLOGY*, 36, 63-74. doi:10.1016/j.funeco.2018.07.009
  - + Porazinska, D. L., Farrer, E. C., Spasojevic, M. J., de Mesquita, C. P. B., Suding, K. N., & Schmidt, S. K. (2018). Assembly and function of nematode communities in an early successional alpine landscape. *JOURNAL OF NEMATOLOGY* Vol. 50 (pp. 652).
- Bjorkman, A. D., Myers-Smith, I. H., Elmendorf, S. C., Normand, S., Thomas, H. J. D., Alatalo, J. M., Suding, K. N... Zamin, T. (2018). Tundra Trait Team: A database of plant traits spanning the tundra biome. *GLOBAL ECOLOGY AND BIOGEOGRAPHY*, 27(12), 1402-1411. doi:10.1111/geb.12821
- + Hallett, L. M., Farrer, E. C., Suding, K. N., Mooney, H. A., & Hobbs, R. J. (2018). Tradeoffs in demographic mechanisms underlie differences in species abundance and stability. *NATURE COMMUNICATIONS*, 9, 6 pages. doi:10.1038/s41467-018-07535-w
- Litaor, M. I., Suding, K., Anderson, S. P., Litus, G., & Caine, N. (2018). Alpine catena response to nitrogen deposition and its effect on the aquatic system. *CATENA*, 170, 108-118. doi:10.1016/j.catena.2018.06.004
- + Dudney, J., Hobbs, R. J., Heilmayr, R., Battles, J. J., & Suding, K. N. (2018). Navigating Novelty and Risk in Resilience Management. *TRENDS IN ECOLOGY & EVOLUTION*, 33(11), 863-873. doi:10.1016/j.tree.2018.08.012. Senior author.
  - Bjorkman, A. D., Myers-Smith, I. H., Elmendorf, S. C., Normand, S., Rueger, N., Beck, P. S., Suding, K. N... Weiher, E. (2018). Plant functional trait change across a warming tundra biome. *NATURE*, 562(7725), 57-59. doi:10.1038/s41586-018-0563-7

- + Prugh, L. R., Deguines, N., Grinath, J. B., Suding, K. N., Bean, W. T., Stafford, R., & Brashares, J. S. (2018). Ecological winners and losers of extreme drought in California. *NATURE CLIMATE CHANGE*, 8(9), 819-821. doi:10.1038/s41558-018-0255-1
  - + de Mesquita, C. P. B., del Rio, C. M. M., Suding, K. N., & Schmidt, S. K. (2018). Rapid temporal changes in root colonization by arbuscular mycorrhizal fungi and fine root endophytes, not dark septate endophytes, track plant activity and environment in an alpine ecosystem. *MYCORRHIZA*, 28(8), 717-726. doi:10.1007/s00572-018-0863-7
  - + Porazinska, D. L., Farrer, E. C., Spasojevic, M. J., de Mesquita, C. P. B., Sartwell, S. A., Smith, J. G., Suding, K. N. & Schmidt, S. K. (2018). Plant diversity and density predict belowground diversity and function in an early successional alpine ecosystem. *ECOLOGY*, 99(9), 1942-1952. doi:10.1002/ecy.2420
  - + Grinath, J. B., Deguines, N., Chesnut, J. W., Prugh, L. R., Brashares, J. S., & Suding, K. N. (2018). Animals alter precipitation legacies: Trophic and ecosystem engineering effects on plant community temporal dynamics. *JOURNAL OF ECOLOGY*, 106(4), 1454-1469. doi:10.1111/1365-2745.12936. *Senior author.*
- Higgs, E., Harris, J., Murphy, S., Bowers, K., Hobbs, R., Jenkins, W., Suding, K.N.,...Whisenant, S. (2018). On principles and standards in ecological restoration. *RESTORATION ECOLOGY*, 26(3), 399-403. doi:10.1111/rec.12691
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  - + Larios, L., Hallett, L. M., & Suding, K. N. (2017). Where and how to restore in a changing world: a demographic-based assessment of resilience. *JOURNAL OF APPLIED ECOLOGY*, 54(4), 1040-1050. doi:10.1111/1365-2664.12946. *Senior author.*
  - + de Mesquita, C. P. B., Knelman, J. E., King, A. J., Farrer, E. C., Porazinska, D. L., Schmidt, S. K., & Suding, K. N. (2017). Plant colonization of moss-dominated soils in the alpine: Microbial and biogeochemical implications. *SOIL BIOLOGY & BIOCHEMISTRY*, 111, 135-142. doi:10.1016/j.soilbio.2017.04.008. *Senior author.*
  - + Hallett, L. M., Chapple, D. E., Bickart, N., Cherbowsky, A., Fernandez, L., Ho, C. H., . . . Suding, K. N. (2017). Trait Complementarity Enhances Native Plant Restoration in an Invaded Urban Landscape. *ECOLOGICAL RESTORATION*, 35(2), 148-155. doi:10.3386/er.35.2.148. *Senior author.*
  - + Dronova, I., Spotswood, E. N., & Suding, K. N. (2017). Opportunities and Constraints in Characterizing Landscape Distribution of an Invasive Grass from Very High Resolution Multi-Spectral Imagery. *FRONTIERS IN PLANT SCIENCE*, 8, 17 pages. doi:10.3389/fpls.2017.00890. *Senior author.*
- Wieder, W. R., Knowles, J. F., Blanken, P. D., Swenson, S. C., & Suding, K. N. (2017). Ecosystem function in complex mountain terrain: Combining models and long-term observations to advance process-based understanding. *JOURNAL OF GEOPHYSICAL RESEARCH-BIOGEOSCIENCES*, 122(4), 825-845. doi:10.1002/2016JG003704. *Senior author.*

- + Chapple, D. E., Faber, P., Suding, K. N., & Merenlender, A. M. (2017). Climate Variability Structures Plant Community Dynamics in Mediterranean Restored and Reference Tidal Wetlands. *WATER*, 9(3), 16 pages. doi:10.3390/w9030209
- + Schile, L. M., Callaway, J. C., Suding, K. N., & Kelly, N. M. (2017). Can community structure track sea-level rise? Stress and competitive controls in tidal wetlands. *ECOLOGY AND EVOLUTION*, 7(4), 1276-1285. doi:10.1002/ece3.2758
- + Hallett, L. M., Stein, C., & Suding, K. N. (2017). Functional diversity increases ecological stability in a grazed grassland. *OECOLOGIA*, 183(3), 831-840. doi:10.1007/s00442-016-3802-3. *Senior author*.
- + Mariotte, P., Spotswood, E. N., Farrer, E. C., & Suding, K. N. (2017). Positive litter feedbacks of an introduced species reduce native diversity and promote invasion in Californian grasslands. *APPLIED VEGETATION SCIENCE*, 20(1), 28-39. doi:10.1111/avsc.12291. *Senior author*.
- + Dudney, J., Hallett, L. M., Spotswood, E. N., & Suding, K. (2017). Invasive species and ecological restoration. In S. K. Allison, & S. D. Murphy (Eds.), *ROUTLEDGE HANDBOOK OF ECOLOGICAL AND ENVIRONMENTAL RESTORATION* (pp. 496-508).
- + Kimball, S., Funk, J. L., Spasojevic, M. J., Suding, K. N., Parker, S., & Goulden, M. L. (2016). Can functional traits predict plant community response to global change? *ECOSPHERE*, 7(12), 18 pages. doi:10.1002/ecs2.1602
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- + Spotswood, E. N., Mariotte, P., Farrer, E. C., Nichols, L., & Suding, K. N. (2017). Separating sources of density-dependent and density-independent establishment limitation in invading species. *JOURNAL OF ECOLOGY*, 105(2), 436-444. doi:10.1111/1365-2745.12686. *Senior author*.
- + Berleman, S. A., Suding, K. N., Fry, D. L., Bartolome, J. W., & Stephens, S. L. (2016). Prescribed Fire Effects on Population Dynamics of an Annual Grassland. *RANGELAND ECOLOGY & MANAGEMENT*, 69(6), 423-429. doi:10.1016/j.rama.2016.07.006
- + Dudney, J., Hallett, L. M., Larios, L., Farrer, E. C., Spotswood, E. N., Stein, C., & Suding, K. N. (2017). Lagging behind: have we overlooked previous-year rainfall effects in annual grasslands? *JOURNAL OF ECOLOGY*, 105(2), 484-495. doi:10.1111/1365-2745.12671. *Senior author*.
- + Bechara, F. C., Dickens, S. J., Farrer, E. C., Larios, L., Spotswood, E. N., Mariotte, P., & Suding, K. N. (2016). Neotropical rainforest restoration: comparing passive, plantation and nucleation approaches. *BIODIVERSITY AND CONSERVATION*, 25(11), 2021-2034. doi:10.1007/s10531-016-1186-7. *Senior author*.
- + Korell, L., Stein, C., Hensen, I., Bruelheide, H., Suding, K. N., & Auge, H. (2016). Stronger effect of gastropods than rodents on seedling establishment, irrespective of exotic or native plant species origin. *OIKOS*, 125(10), 1467-1477. doi:10.1111/oik.02696
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- Hinckley, E. -L. S., Anderson, S. P., Baron, J. S., Blanken, P. D., Bonan, G. B., Bowman, W. D., Suding, K. N... Wieder, W. R. (2016). Optimizing Available Network Resources to Address Questions in Environmental Biogeochemistry. *BIOSCIENCE*, 66(4), 317-326. doi:10.1093/biosci/biw005
- + Spasojevic, M. J., Bahlai, C. A., Bradley, B. A., Butterfield, B. J., Tuanmu, M. -N., Sistla, S. & Suding, K. N. (2016). Scaling up the diversity-resilience relationship with traitdatabases and remote sensing data:

- the recovery of productivity after wildfire. *GLOBAL CHANGE BIOLOGY*, 22(4), 1421-1432. doi:10.1111/gcb.13174. Senior author.
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  - Williams, M. W., Seastedt, T. R., Bowman, W. D., McKnight, D. M., & Suding, K. N. (2015). An overview of research from a high elevation landscape: the Niwot Ridge, Colorado Long Term Ecological Research programme. *PLANT ECOLOGY & DIVERSITY*, 8(5-6), 597-605. doi:10.1080/17550874.2015.1123320
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## **Research Funding** (current funding \$9.6 million, >90% as PI; over \$30 million grant funding)

### **Current Projects**

National Science Foundation, Long-term Ecological Research Program. "NWT LTER VII: Long-term research on the dynamics of high-elevation ecosystems – a framework for understanding ecological responsiveness to climate change" PI. 2016-2023. \$6.8 million.

United States Department of Agriculture, AFRI Climate Challenge, "Ranching, rangelands, and resilience: ensuring adaptive capacity in an increasingly variable climate." 2017-2022. PI. \$1.2 million.

United States Department of Agriculture, Ecosystems Services and Diversity Program, "Direct and legacy effects of compost amendments on rangeland ecosystem services." Co-PI with L. Hallett and W. Silver, 2017-2019, \$499,000.

United States Department of Agriculture, Ecosystems Services and Diversity Program, "From seed to service: Managing the microsite to maximize returns in rangeland restoration and rehabilitation." \$499,000. 2020-2024. Co-PI with N. Shackelford and M. Mattson.

National Science Foundation, Improving Undergraduate STEM Education, "Elevating Course-based undergraduate Research with the Power of Place: POP-CURE", co-PI with L. Corwin, 2018-2021, \$300,000.

### **Previous Projects**

National Science Foundation, Division of Environmental Biology, "Moving uphill: microbial facilitation at the leading edge of plant species distributional shifts" PI 2015-2019, \$790,000.

United States Department of Agriculture AFRI, Soil Processes in Agroecosystem Program, "Ensuring Rangeland Production in a Variable Climate," PI 2013-2018. \$499,000.

University of Colorado, Research and Innovation Office, "The Boulder Apple Tree Project" PI. 2017-2018. \$50,000.

National Science Foundation, Division of Environmental Biology, "Collaborative Research: Interactive effects of climate, ecosystem engineering, and trophic interactions on grassland community dynamics" non-lead PI. 2014-2018. \$780,000.

United States Department of Agriculture AFRI, Thresholds in Agroecosystems Program. "Managing threshold dynamics in noxious weed invasions: cross-scale interactions and positive feedbacks." PI. 2012-2017. \$495,000.

National Science Foundation, Long-term Ecological Research Program. "The Niwot Ridge Long-Term Ecological Research Program 2011-2016: Tipping Points in High-Elevation Ecosystems in Response to Changes in Climate and Atmospheric Deposition." PI starting in 2014 (from M. Williams). \$5.9 Million

Nature Reserve of Orange County Science Program. "Patterns of vegetation change, recovery trajectories and thresholds in NCCP conservation lands" 2013-2014 PI \$120,000.

United States Department of Agriculture AFRI, Weedy and Invasive Species Program. "Sustainable solutions to cross thresholds and build ecological resilience: Orange County Invasive Management (OCIM) project" 2009-2012. PI. \$494,000.

National Science Foundation, Division of Environmental Biology, "Collaborative Research: Dynamics of plant-soil interactions in a changing environment" 2009-2012, lead PI \$499,000

Department of Energy, "Physiological, demographic, and competitive controls on the response of California ecosystems to environmental change" Co-PI w/ Michael Goulden. 2008-2013 \$1.5 million.

Nature Reserve of Orange County, "The protection and restoration of the northern Santa Ana Mountain populations of Cupressus forbesii" 2009-2010. PI. \$73,515.

Integrated Hardwood Management Program, University of California, "Landscape-scale relationships between oak recruitment and livestock management" 2005-2010. PI. \$123,000.

National Park Service, "Breaking restoration constraints in sites invaded by Conium maculatum in the Santa Monica Mountains", 2007-2010, PI. \$36,000.

Nature Reserve of Orange County, "The sustainability of Cynara cardunculus control efforts in historic Californian rangeland" 2007-2009. PI. \$160,000.

National Science Foundation, Division of Environmental Biology, "Multiple states in grassland systems: invasion and environmental feedbacks" 2006-2011. PI. \$539,000.

United States Department of Agriculture, CREES National Competitive Grants Program, "Mechanistic foundations of state and transition models: linking application and theory" 2006-2010. PI. \$399,602.

Andrew K. Mellon Foundation, Young Investigator Award, "Feedbacks between species and ecosystem function: N form use & carbon compound inputs" 2005-2009. PI. \$230,000.

Department of Energy, "Physiological, demographic, and competitive controls on the response of California ecosystems to environmental change." Co-PI w/ Michael Goulden. 2005-2008. \$1.13 million.

Center for Invasive Plant Management, Department of the Interior, Bureau of Land Management, "Managing the spread of invasive plants: application of the threshold concept in a spatially-explicit model tool." 2006-2007. PI. \$30,000.

National Science Foundation, Long-term Ecological Research Program. "The Niwot Ridge Long-Term Ecological Research Program 2004-2010: the landscape continuum model – a biogeochemical paradigm for high elevation ecosystems." 2004-2010. Co-PI (with 8 others). PI Mark Williams, University of Colorado. \$4.9 million.

The Nature Conservancy, "Priority effects, exotics, and edges: tests of invasion and invasion resistance at IRLR" 2004-2006. PI. \$92,000.

Michigan Department of Military and Veterans Affairs, "Ecological restoration plans for prairie-savanna and prairie-fen communities at the Fort Custer Training Center, Augusta, Michigan" 2000-2002. Co-PI with K. Gross. \$181,000.

USDA/CSREES national research initiative competitive grants program, "Causes and consequences of invasion of a C<sub>3</sub>-C<sub>4</sub> grassland by Diffuse Knapweed" 2001- 2004. Co-PI w/ T. Seastedt. \$280,000.

Andrew W. Mellon Foundation, "Consequences of plant species effects on nitrogen cycling: can ecosystem modifications shift competitive rankings?" 2001-2005. Co-PI w/ W. Bowman. \$289,000.

National Science Foundation Dissertation Improvement Grant, "Mechanisms of species compositional change due to gap creation in a tallgrass prairie" 1997-1998. Co-PI with D. Goldberg. \$5,800.

### **Student and Postdoctoral Research Funding**

United States Department of Agriculture AFRI Research Fellowship Program "Drought and grazing interactions to affect rangeland function" to support dissertation work of Julie Larson. 2019-2021. \$90,000.

United States Department of Agriculture AFRI Research Fellowship Program "Species specialization and ecological restoration of degraded rangeland" to support postdoctoral work of Nancy Shackelford. 2019-2021. \$130,000.

National Science Foundation, Graduate Research Fellowship, "Incorporating ecophysiology into riparian restoration" in support of dissertation work of Isabel Schroeter. 2017-2020.

The Wilderness Society, Gloria Baron Wilderness Research Fund, "Resilience of white pines in the Sierra Nevada: climate, disease, management" in support of dissertation work of Joan Dudney, 2017-2018. \$10,000.

City of Boulder Open Space, "Functional Strategies Along a Soil Moisture/Age Gradient," in support of dissertation work of Julie Larson, 2017. \$10,800.

National Science Foundation, Graduate Research Fellowship, "Rethinking resistance: drought impacts on the white pine blister rust pathosystem" in support of dissertation work of Joan Dudney. 2015-2018.

United States Department of Agriculture AFRI Research Fellowship Program "Mechanisms of compensatory dynamics and stability of rangeland production" to support dissertation work of Lauren Hallett. 2014-2016. \$70,000.

National Science Foundation, Graduate Research Fellowship, "Dispersal and spatial processes in tidal marsh restoration dynamics" to support work of dissertation work of Dylan Chapple. 2013-2016.

National Science Foundation, Dissertation Improvement Grant, "Mechanisms of Compensatory Dynamics in Natural Systems" to support dissertation work of Lauren Hallett. 2013-2015.

United States Department of Agriculture, AFRI Research Fellowship Program "Dispersal vectors and risk assessment of noxious weed spread: Medusahead invasion in California rangelands" to support postdoctoral work of Emily Farrer. 2012-2015 \$130,000.

National Science Foundation, Dissertation Improvement Grant, "Predicting community response to nitrogen enrichment using plant traits," to support dissertation work of Marko Spasojevic. 2009-2011.

National Science Foundation, Dissertation Improvement Grant, "Effects of Genetic Diversity on Invasive Population Success," to support dissertation work of Heather McGay. 2009-2011.

National Science Foundation, Graduate Research Fellowship, "Effects of Nitrogen Deposition on Ecological Resilience of a Native Plant Community" to support dissertation work of Loralee Larios. 2009-2012.

National Science Foundation, Dissertation Improvement Grant, "The influence of rainfall pulses and disturbance on the invasion of coastal sage scrub," to support dissertation work of Leah Goldstein. 2008-2009.

National Science Foundation, supplement to "Multiple States in Grassland Systems: Invasion and Environmental Feedbacks" to support dissertation work of Loralee Larios. 2008-2010. \$50,000.

National Science Foundation, Research Experience for Undergraduates, supplement to various NSF grants for independent undergraduate research. 2008, 2009, 2010 (2), 2011 (2), 2012, 2013, 2015, 2016, 2017, 2018.

### **Support for Working Groups and Meetings**

PI: Theo Murphy Award, Royal Society of London, Restoration Science Relevant for Action, ~\$40,000, 2019.  
With R. Hobbs, S. Murphy, E. Higgs, J. Harris.

Co-PI: National Center for Ecological Analysis and Synthesis, Network Communications Office, Synthesizing population and community synchrony to understand drivers of ecological stability across LTER sites. \$106,000. 2015-2018. With L. Hallett and D. Rueman.

Co-PI: National Center for Ecological Analysis and Synthesis, Distributed Graduate Seminar, Comparative Functional Ecology, \$50,000, 2006-2008.

PI: Borchard Foundation, How can we forecast global change impacts on biological diversity and ecosystem health? Chateau de la Breteshe, France, \$25,000. 2004.

### **Classroom Teaching**

- **EBIO 1250. 4 cr. *Introduction to EBIO Research.*** (2019) is a new first-year intensive course-based undergraduate research experience (CURE) on local historic apple trees to fulfil general biology requirements for EBIO majors. Students present research on the genetics, ecophysiology, and urban ecology to community members at the annual Apple Tree Symposium.
- **EBIO 4460. 4 cr. *Restoration Ecology*** (2010, 2011, 2012, 2013, 2014, 2016, 2018) is an intensive field-based course that combines lectures on key topics in restoration-relevant ecological theory with practitioner-led seminars that provide the opportunity to delve into current practice and critically assess lecture topics. A core component of the course is genuine research experience where the students conduct research and produce a management report for a client. In the last several years

our client has been ecologists at the City of Boulder Open Space and we have worked on problems ranging from effects of trails on bird habitat to control of invasive species.

- **Other classes include:** EBIO 2040 (*Principles of Ecology*), EBIO 6100 (*Multivariate statistical methods*), EBIO 6100 (*Thresholds in complex systems*), EBIO 6100 (*Community Ecology*)

**Research Mentorship.** I currently serve on graduate committees of 26 CU and one UC Santa Cruz student, including as major advisor to 5 PhD and 2 MS students in EBIO. I also currently advise 6 undergraduates in UROP/honors, and mentor 2 postdoctoral researchers. Of my past advisees, 10 hold faculty positions at R1 Universities, 6 are faculty at predominately undergraduate schools, and 5 work at NGOs or federal agencies.

**Current Graduate Students (matriculation yr)(7):** C. White (2016, CU Boulder, USGS Intern Program), J. Larson (2016, CU Boulder, USDA graduate fellow), L. Brigham (2017, CU Boulder), I. Schroeter (2017, CU Boulder, NSF graduate fellow, National Parks Climate Fellow), T. Merchant (2019, CU Boulder), N. Harmon (2019, MS, CU Boulder, Turkish National Scholar), M. Stueber (2020, BA/MA, CU Boulder).

**Past Graduate Students (degree, year, current position)(11):** M. Talluto (MS 2005, postdoc, University of Toronto), R. Aicher (PhD 2009, Lead, AAAS Trellis program), M. Spasojevic (PhD 2010, Assistant professor, UC Riverside), L. Goldstein (PhD 2010, Ecologist, Great Basin Institute), H. McGraw (PhD 2011, Department Chair, San Diego City College), L. Larios (PhD 2014, Assistant professor, UC Riverside), J. Hsu (MS 2013, California Edison), L. Hallett (PhD 2014; Assistant professor, University of Oregon), D. Chapple (PhD 2017, Scientist, Delta Science Council), J. Dudney (PhD 2019, Smith Conservation Fellow, UC Davis), C. Bueno de Mesquita (PhD 2019, postdoc at IGU Berkeley).

**Current Post-docs (2):** E. Van Cleemput (PhD, University of Leuven), University of C. Collins (PhD, University of California Riverside).

**Past Post-docs (current position) (11):** W. Harpole (Professor, iDiv Germany), I. Ashton (Senior ecologist, National Park Service), E. Cleland (Professor, UC San Diego), D. Potts (Associate professor, Buffalo State University), B. Butterfield (Associate professor, Northern Arizona University), S. Rodriguez-Buriticá (Lead ecologist, Humboldt Institute, Bogota), C. Stein (Assistant professor, Auburn University), S. Dickens (Biologist, USFS), E. Farrer (Assistant professor, Tulane University), J. Grinath (Assistant professor, Idaho State University), N. Shackelford (Assistant professor, University of Victoria BC).

**Current Visiting Scholars (home institution, position)(1):** Maria Elena Hernandez (Columbia, Fulbright scholar, graduate student)(Deferred to Feb 2021)

**Past Visiting Scholars (home institution, position)(8):** Peter Carrick, (South Africa, Fulbright visiting scholar), Elise Van Cleemput (Belgium, visiting postdoc), Laura Yahjadan (Argentina, Fulbright visiting scholar), Harold Auge (Germany, Ireland, Fulbright visiting scholar), Conor Meade (Ireland, Fulbright visiting scholar), Sebastian Carrasco (Chile, graduate student), Jana Mullerova (Czech Republic, Fulbright visiting professor), Yongtao He (China, visiting faculty)

**Undergraduate Mentorship:** UROP and other paid research opportunities (8 students, 2020); Honors thesis advisor (M. Seaver, 2020; E. Kelman, 2019; K. Ebinger, 2018; G. Casto, 2017); SMART (A. Miller, 2020; T. Burnette, 2018), REU/RECCS (L. Warren, 2020);

## Professional Activities

### **University Service**

- Task Force on Interdisciplinary Teaching and Research, Academic Futures, 2019.
- Vice-Chancellors Advisory Committee (VCAC), campus-level reviews of tenure, promotion, and reappointment cases. 2017-2020.
- Director, Niwot Ridge Long-term Ecological Research Program. An NSF-funded large interdisciplinary research program focused on high-elevation mountain systems through INSTAAR. 2013-present
- Faculty Search Committees. EBIO: Fungal biologist, Large-scale ecologist; INSTAAR: Institute director.

**Editorial Boards:** *Ecology Letters*, 2006-2019 *Ecological Restoration*, 2016-2019; *Biological Reviews*, 2010-2016

### **Ecological Society of America**

- Chair, Awards Committee, leading 9 subcommittees tasked with Fellow designations and over a dozen society-wide awards, 2018-2020.
- Chair, Shreve and Whittaker Award Subcommittee, 2016-2018
- Eminent Ecologist Award Subcommittee, 2009-2016; Cooper Award Committee, 2006-2008; Emerging Issues Conference, Review Committee, 2012
- Early Career Workshop on Population and Community Ecology at Continental Scales, Steering committee, 2012-2013

### **Advisory Boards, Executive Committees**

- Long-term Ecological Network, National Science Foundation, Executive board, 2016-2020
- Berkeley Laboratory, DOE Watershed Function Scientific Focus Area, 2016-2019
- San Francisco Estuary Institute, Resilient Landscapes Program, 2015-2019
- Kellogg Biological Station, Long-term Ecological Research Project, 2017-2019
- Kansas EBSCoR Project, Microbiomes of Aquatic, Plant and Soil Systems mediating sustainability; 2016-2019
- Board of Directors: Urban Creek Council, 2013-2014; California Invasive Plant Council, 2010

### **Meeting chair, session chair**

- Meeting Chair, Royal Society of London, Restoration Science Relevant for Action, 80 international participants, Sept 2019.
- Meeting Co-Chair, All-scientist Meeting, Long-term Ecological Network, , 500 participants, Oct 2018.
- Symposium chair, Showcase of Early Career Fellows, Ecological Society of America, Aug 2020.
- Session co-chair, Synchrony and resilience to climate drivers, Ecological Society of America, Aug 2019.

### **Outreach Activities**

- Museum of Boulder, public exhibit, "Our Living Landscape: exploring the Boulder Watershed," Jan-March 2020.
- CU Museum of Natural History, public virtual exhibit, "Boulder Apple Tree Project," April 2020-present.
- TEDxCU talk "Curiosity starts in your backyard" 40,000 views since April 2019.
- Science Friday "Uncovering a Colorado Apple Mystery" live at Chautauqua Auditorium, June 2019.
- Interviews in 9 News, the Coloradan, Daily Camera, 5280 Magazine, Huffington Post, the Guardian, Vice Magazine, and Colorado Public Radio.
- Invited speaker to such community events as the Fort Collins Book Festival, Denver Zoo Conservation Leadership Series, Center for Sustainable Landscapes and Communities symposium, Denver Botanical Gardens Botanique Series.

**Speaking Invitations** (73 invited seminars and symposium addresses, >12 international keynotes)

**2020:** Landcare Institute, New Zealand (adjusted due to COVID), Boise State University (cancelled due to COVID), Boulder Apple Tree Symposium (virtual).

**2019:** Michigan State University (graduate student selected speaker); Ecological Society of America (MacArthur Address); Santa Barbara Botanical Gardens (Trailblazer symposium); Duke University (symposium speaker)

**2018:** Canada Society of Ecological Restoration (keynote speaker), University of Arizona (invited seminar speaker), ETH Zurich Forest Landscape Symposium (symposium speaker), University of California Davis (seminar speaker)

**2017:** Chicago Botanical Garden and Northwestern University (invited speaker), Central Plains Society for Ecological Restoration (plenary speaker), Ecological Society of America conference (recent advances lecturer), International Congress of the Society for Restoration Ecology (keynote speaker)

**2016:** Duke University (invited speaker), Rocky Mountain Biological Laboratory (invited speaker), University of Oklahoma (distinguished lecturer), Natural Areas Conference (plenary speaker), German Ecological Society (keynote speaker), Miami University of Ohio (distinguished lecturer)

**2015:** University of Nevada at Reno (invited speaker), Ecological Society of America conference (symposium speaker), University of Minnesota (invited speaker), University of Kansas (invited speaker)

**2014:** Pennsylvania State University (invited speaker), University of Michigan (invited speaker), Society for Conservation Biology (symposium speaker), Michigan State University (invited speaker), Kellogg Biological Station (invited speaker), International Society of Mediterranean Ecology MEDICOS (plenary speaker)

**2013:** International Congress of the Society for Restoration Ecology (symposium speaker), University of Colorado (invited speaker)

**2012:** University of British Columbia (invited speaker), University of California at Merced (invited speaker), Stanford University (invited speaker), Society for Conservation Biology (symposium speaker), Ecological Society of America conference (symposium speaker), Sonoma State University (invited speaker), Cal Poly Pomona (invited speaker)

**2011:** San Francisco State University (invited speaker), CLIMANI/INTERFACE Iceland (invited speaker), California Invasive Plant Council (symposium speaker)

**2010:** Rangeland Society Annual Meeting (symposium speaker), Sendai University, Japan (invited speaker), University of Wisconsin (invited speaker), University of California at Santa Cruz (invited speaker), Indiana University (invited speaker)

**2009:** International Congress of Ecology, Brisbane (symposium speaker), China Agricultural University (invited speaker), University of California Berkeley (invited speaker)

**2008:** Arizona State University (invited speaker), University of California Davis (invited speaker), Montana State University (invited speaker), Charles Darwin Foundation, Galapagos (invited speaker)

**2007:** University of Texas Austin (invited speaker), Rutgers University (invited speaker), Ecological Society of America conference (symposium speaker)

**2006:** Ecological Society of America conference (symposium speaker)

**2005:** University of California Riverside (seminar), University of California Irvine (seminar), University of Tennessee (seminar), International Botanical Congress, Vienna (symposium), University of Arizona (seminar), Michigan State University (seminar)

**2004:** University of New Mexico (invited speaker), National Academy of Sciences, Collaboration in Ecology (invited speaker), Idaho State University (invited speaker), Pepperdine University (invited speaker), University of California at Davis (invited speaker)

**2003:** California State University Long Beach (invited speaker), Universite de Montpellier (invited speaker), University of Michigan (invited speaker), ILTER Symposium France (invited speaker)