Philip E. Higuera

Professor of Fire Ecology

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AT A GLANCE

Research

Science to understand and inform

86 — **Refereed pubs** — *+19 non-refereed; 16,000+ citations*

h = 58 — **Impact** — *i10 = 92 (Google Scholar)*

$5.6M — **External funding** — *$3.8M to UM since 2015*

40+ — **Invited presentations** — *24 academic seminars + 15+ invited conf. talks*

★ **Highly Cited Researcher, 2025** *(Web of Science)*

Teaching & training

Training future scientists, managers, and citizens

5 — **Postdocs** — *supervised since 2013*

7 — **Grad students (PI)** — *+13 undergrad researchers / theses*

23 — **Grad committees** — *past and current; multi-institution*

45 — **Univ. classes taught** — *34 ugrad + 11 grad 3-cr course-equivalents since 2008; fire ecology focus*

Outreach & media

Science communication to citizens, managers, and policy makers

55 — **Expert media features** — *expert source on fire-related topics; coverage of research since 2016*

7 — **Op-eds** — *WaPo, The Conversation, regional press*

18 — **Public & policy talks** — *lectures, panels, legislative & agency briefings*

33 — **Outlets reached** — *incl. NPR, NYT, WaPo, BBC, Sci. Am., CNN, Nat. Geo., PBS*

All metrics current to April 2026. See dedicated sections below for full detail.

EDUCATION

Ph.D. 2006 University of Washington, Seattle, Division of Ecosystem Science, College of Forest Resources. Advisor: Dr. Linda Brubaker. Committee members: Drs. James Agee, Patricia Anderson, Daniel Gavin, Douglas Sprugel

M.S. 2002 University of Washington, Seattle, Division of Ecosystem Science, College of Forest Resources. Advisors: Dr. Linda Brubaker and Dr. Douglas Sprugel

B.A. 1998 Middlebury College, Middlebury, VT: magna cum laude; High Honors, Biology, High Honors, Environmental Studies-Geology. Thesis advisors: Drs. Andrea Lloyd and Grant Meyer

ACADEMIC APPOINTMENTS

2021 – Professor, Department of Ecosystem and Conservation Sciences, W.A. Franke College of Forestry and Conservation, University of Montana

2021-2022 Visiting sabbatical fellow, Earth Lab, Cooperative Institute for Research In Environmental Sciences, University of Colorado, Boulder (Oct. – Feb.)

2015-2021 Associate Professor, Department of Ecosystem and Conservation Sciences, W.A. Franke College of Forestry and Conservation, University of Montana

2009-2015 Assistant Professor, Department of Forest, Rangeland, and Fire Sciences, College of Natural Resources, University of Idaho (tenure & promotion awarded April 2015)

2008-2009 Adjunct Instructor, Department of Earth Science, Montana State University

2006-2009 National Park Ecological Research Fellow, Whitlock Paleoecology Lab, Montana State University

2006-2009 Postdoctoral Research Scientist, Hu Quaternary Paleoecology Lab, University of Illinois

HONORS AND AWARDS

2024 University of Montana Faculty Merit Award

2021 Research featured as one of five on NSF's Year in Review

2020 University of Montana Faculty Merit Award

2019 Steve Running Research Award, W.A. Franke College of Forestry and Conservation, University of Montana

2018 University of Montana Faculty Merit Award

2018 Clarivate Analytics Highly Cited Scientist (1 of 6,000 globally across 21 fields), for nine highly cited publications over the previous five years

2012 Outstanding Research Award, College of Natural Resources, University of Idaho

2009 USGS Mendenhall Postdoctoral Fellowship (awarded; declined)

2004, 2005 2nd place, Edward S. Deevey Award for Excellence in Paleoecology, presented to the best student presentation in paleoecology at the Ecological Society of America Meetings, Portland, OR, and Montreal, Quebec

2003 1st place, student poster competition, Study of Environmental Arctic Change open science meeting, Seattle, WA. $1,000 award to attend an international meeting

2001 2nd place, Edward S. Deevey Award for Excellence in Paleoecology, Ecological Society of America Meeting, Madison, WI

2000 Xi Sigma Pi Forestry Honors Society, University of Washington

1998 Elbert C. Cole Award for outstanding performance in the Department of Biology, Middlebury College

EXTERNAL GRANTS AND AWARDS

$5.6 million in extramural funding since 2006; $3.8 million to the University of Montana since 2015. Roles include PI, co-PI, lead, and collaborator.

2026-2030 Strategic Environmental Research and Development Program, Department of Defense (RC36-0360): “Boreal Burning Baselines: Historical Variability and Fire-related Thresholds to Ecosystem Transformation” Higuera (PI), and co-PIs William Nanavati (UM), Melissa Chipman (College of William & Mary), Chad Hoffman (Colorado State Univ.), Katherine Hayes (Univ. of Alaska), and Adam Atchley (Los Alamos Nat. Lab). Total: >$1.7 million (UM $1.57 million).

2023-2027 National Science Foundation, Arctic Natural Sciences (OPP-2215120): “Collaborative Research: The Past, Present, and Future of Boreal Fire Feedbacks” Higuera (co-PI), Brian Buma (PI, CU Denver), Melissa Chipman (co-PI, Syracuse Univ.), and Chad Hoffman (Colorado State Univ.). Total: >$1.5 million (UM $641,023).

2022-2024 USDI, BLM, Joint Fire Science Program, Graduate Research and Innovation: “Impacts of wildfires and climate change on western larch regeneration” Spencer Vieira (student investigator), Davis and Higuera (co-PIs). Total: $28,685.

2022-2023 USGS Northwest Climate Adaptation Science Center graduate fellowship: “Impacts of wildfires and climate change on western larch regeneration” Spencer Vieira (student investigator), Davis and Higuera (co-PIs). Total: $26,663.

2021-2023 The Nature Conservancy (*non-competitive): “Western US Forest Post-fire Regeneration” Kim Davis (PI), Higuera (co-PI). Total: $84,369.

2020-2022 USGS North-Central Climate Science Center, Competitive Research Grant: “Post- fire conifer regeneration and reforestation strategies under changing climate conditions.” Kimberley Davis (PI), with co-PIs Higuera, S. Dobrowski, Z. Holden (USFS). Total: $210,414.

2019-2023 USGS North-Central Climate Science Center, Cooperating Partner with CU Boulder (lead institution), “Social-ecological resilience to changing wildfire activity.” Higuera (UM PI). Total: $176,517.

2019-2022 USFS, Rocky Mountain Research Station cooperative agreement (*non-competitive): “PaleoEcological evaluation of fire and vegetation transformations in central Colorado.” Higuera (UM PI), and co-PIs Sean Parks, Jonathan Coop, Shelley Crausbay. Total: $34,969.

2018-2021 USDI, BLM, Joint Fire Science Program, Graduate Research and Innovation: “Impacts of burn severity , microclimate, and soil properties on initial post-fire tree regeneration.” Kyra Wolf (student investigator), Higuera and Davis (co-PIs). Total: $24,986.

2017-2023 National Science Foundation, Division of Environmental Biology (DEB-1655121): “Collaborative Research: Causes and consequences of fire-regime variability in Rocky Mountain forests.” Higuera (PI), and co-PIs T. Hudiburg (U. Idaho), K. McLauchlan (Kansas St. Univ.), B. Shuman (U. Wyoming). Total: $860,087 (UM $351,300).

2016-2020 USDI, BLM, Joint Fire Science Program: “Identifying ecological and social resilience in fire-prone landscapes” Higuera (PI), and co-PIs Elizabeth Covelli Metcalf, Alex Metcalf, Dave McWethy, and Carol Miller (USFS). Total: $290,560 (UM $227,926).

2016-2021 USDI, BLM, Joint Fire Science Program: “Climate variability and post-fire forest regeneration in the Northern Rockies.” Higuera (PI), and co-PIs Kimberly Davis (principal author), S. Dobrowski, and Sean Parks (USFS). Total: $355,327.

2014-2017 USDI, BLM, Joint Fire Science Program, Graduate Research and Innovation: “Spatially-explicit impacts of climate on past, present, and future fire regimes in Alaskan boreal forest and tundra ecosystems.” Adam Young (student investigator), Higuera (PI). Total: $24,999.

2013-2018 National Science Foundation, Macrosystems Ecology (1241846): “Collaborative Research and NEON: MSB Category 2: PalEON - a PaleoEcological Observatory Network to Assess Terrestrial Ecosystem Models.” Jason McLachlan, Notre Dame (lead PI), Higuera (UIdaho / UMontana lead), et al. Total: > $4 million, University of Idaho / Montana, $449,778.

2012-2015 USDI, BLM, Joint Fire Science Program, Graduate Research and Innovation: Interactions Among Climate, Wildfire, and Tree Regeneration at Lower Treeline in the Northern Rockies. K. Kemp (student investigator), Higuera (PI). Total: $24,999.

2011-2016 National Science Foundation, Research Coordination Network (1145815), “RCN: The Novus project for integrating paleo- and neo-ecosystem ecology.” Kendra McLauchlan, Kansas State University (PI), and co-PIs Daniel Gavin and Philip Higuera. Total: $505,409, University of Idaho, $0.

2010-2015 National Science Foundation, Partnerships for International Research and Education (0966472): “PIRE: Wildfire feedbacks and consequences of altered fire regimes in the face of climate and land-use change in Tasmania, New Zealand, and the western U.S.” Cathy Whitlock (PI), Higuera (co-PI, UIdaho lead), et al. Total: > $3,800,000 million, University of Idaho, $335,203.

2010-2015 National Science Foundation, Arctic System Science (1023669): “Collaborative Research: Integrating paleoecological analysis and ecological modeling to elucidate the responses of tundra fire regimes to climate change.” Feng Sheng Hu (PI) and co-PIs, Mike Dietze, Paul Duffy, and Philip Higuera (UIdaho lead). Total: > $1,100,000 (+ $370 k logistical support), University of Idaho, $456,612.

2006-2009 National Park Ecological Research Post-doctoral Fellowship, PI: www.esa.org/nper/ $138,000.

2006-2010 USDI, BLM, Joint Fire Science Program: "Reconstructing fire regimes in tundra ecosystems to inform a management-oriented ecosystem model." Higuera, co-PI and principal author; Feng Sheng Hu (PI). Total $306,780.

2000-2003 National Science Foundation Graduate Research Fellowship

REFEREED PUBLICATIONS

*Authorship key: P.E. Higuera in bold; # graduate or undergraduate student advised directly; * student or postdoc co-author indirectly advised; @ postdoctoral researcher advised. [link] marker after each entry opens the publisher page or the PDF on the lab page (umt.edu/paleo-fire-ecology-lab). Indices: ISI Web of Knowledge h = 47, citations >10,000; Google Scholar h = 56, i10 = 89, citations >16,000.*

87. Pourmohamad, Y., J.T. Abatzoglou, E.J. Belval, E. Fleishman, K. Short, M.C. Reeves, N. Nauslar, P.E. Higuera, E. Henderson, S. Ball, A. AghaKouchak, J.P. Prestemon, J. Olszewski, and M. Sadegh. 2024. Physical, social, and biological attributes for improved understanding and prediction of wildfires: FPA FOD-Attributes dataset. Earth System Science Data. 16: 3045-3060. [link]

86. #Vieira, S.T., K.T. Davis, Z. Holden, A.J. Larson, and P.E. Higuera. 2024. Western larch regeneration more sensitive to wildfire-related factors than seasonal climate variability. Forest Ecology and Management. 565: 122001. [link]

85. *Kreider, M.R., P.E. Higuera, Parks, S.A., Rice, W.L., White, N., and A.J. Larson. 2024. Fire suppression makes wildfires more severe and accentuates impacts of climate change and fuel accumulation. Nature Communications. 15: 2412. [link]

84. #Clark-Wolf, K.D., P.E. Higuera, K.K. McLauchlan, B.N. Shuman, and M.C. Parish. 2023. Fire-regime variability and ecosystem resilience over four millennia in a Rocky Mountain subalpine watershed. Journal of Ecology. 111: 2549-2780 doi.org/10.1111/1365- 2745.14201. *Featured on JoE's blog. [link]

83. #Clark-Wolf, K.D., P.E. Higuera, B.N. Shuman, and K.K. McLauchlan. 2023. Wildfire activity in northern Rocky Mountain subalpine forests still within millennial-scale range of variability. Environmental Research Letters. 18: 094029. doi.org/10.1088/1748- 9326/acee16 [link]

82. Modaresi Rad, Arash, J.T. Abatzoglou, E. Fleishman, M.H. Mockrin, V.C. Radeloff, Y. Pourmohamad, M. Cattau, J.M. Johnson, P.E. Higuera, and Mojtaba Sadegh. Social Vulnerability of the People Exposed to Wildfires in U.S. West Coast States. Science Advances 9, 38: https://doi.org/10.1126/sciadv.adh4615 [link]

81. @Peeler, J.L., L. McCauley, K.L. Metlen, T. Woolley, K.T. Davis, M.D. Robles, R.D. Haugo, R.K. Riley, P.E. Higuera, J.E. Fargione, R.N. Addington, S. Bassett, K. Blankenship, M.J. Case, T.B. Chapman, E. Smith, R. Swaty, and N. Welch. Identifying Opportunity Hot Spots for Reducing the Risk of Wildfire-Caused Carbon Loss in Western US Conifer Forests. Environmental Research Letters 18: 094040. doi.org/10.1088/1748-9326/acf05a. [link]

80. Jaffe, M.R., M.R. Kreider, D.L.R. Affleck, P.E. Higuera, C.A. Seielstad, S.A. Parks, and A. J. Larson. 2023. Mesic mixed-conifer forests are resilient to both historical high-severity fire and contemporary reburns in the US Northern Rocky Mountains. Forest Ecology and Management, 545:121283. doi: 10.1016/j.foreco.2023.121283 [link]

79. Davis, K.T., M.D. Robles, K.B. Kemp, P.E. Higuera, and 59 others. 2023. Reduced fire severity offers near-term buffer to climate-driven declines in conifer resilience across the western United States. Proceedings of the National Academy of Sciences, 120: e2208120120. doi: 10.1073/pnas.2208120120 [link]

78. Higuera, P.E., M.C. Cook, J.K. Balch, E.N. Stavros, A.L. Mahood, and L.A. St. Denis. Shifting social-ecological fire regimes explain increasing structure loss from Western wildfires. PNAS Nexus. doi.org/10.1093/pnasnexus/pgad005 [link]

77. #Clark-Wolf, K., P.E. Higuera, and K. T. Davis. 2022. Conifer seedling demography reveals mechanisms of initial forest resilience to wildfires in the northern Rocky Mountains. Forest Ecology and Management doi.org/10.1016/j.foreco.2022.120487 [link]

76. Shuman, J.K., J.K. Balch, R.T. Barnes, P.E. Higuera, C.I. Roos, D.W. Schwilk, E.N. Stavros, and 80 others. Reimagine fire science for the Anthropocene. PNAS Nexus 1, doi: 10.1093/pnasnexus/pgac115 [link]

75. Parish, M., #Wolf, K.D., Higuera, P.E., and Shuman, B.N. 2022. Holocene water levels of Silver Lake, Montana, and the hydroclimate history of the Inland Northwest. Quaternary Research, 110: 54-66. doi:10.1017/qua.2022.17 [link]

74. Rank, R., M. Maneta, P.E. Higuera, Z. Holden, and S. Dobrowski. 2022. Conifer Seedling Survival in Response to High Surface Temperature Events of Varying Intensity and Duration. Frontiers in Forests and Global Change 4. [link]

73. Higuera, P.E., B.N. Shuman, and #K.D. Wolf. 2021. Rocky Mountain subalpine forests now burning more than any time in recent millennia. Proceedings of the National Academy of Sciences. 118: e2103135118. [link]

72. #Wolf, K.D., P.E. Higuera, K.T. Davis, and S.Z. Dobrowski. 2021. Wildfire impacts on forest microclimate vary with biophysical context. Ecosphere. 12: e03467. [link]

71. Davis, K.T., P.E. Higuera, S. Dobrowski, S.A. Parks, J.T. Abatzoglou, M. Rother, and T.T. Veblen. 2020. Fire-catalyzed vegetation shifts in ponderosa pine and Douglas-fir forests of the western United States. Environmental Research Letters. 15: 1040b8. [link]

70. *Chileen, B.V., K.K. McLauchlan, P.E. Higuera, M. Parish, and B.N. Shuman. 2020. Vegetation response to wildfire and climate forcing in a Rocky Mountain lodgepole pine forest over the past 2500 years. The Holocene 30: 1493-1503. [link]

69. Coop, J.D., S.A. Parks, C.S. Stevens-Rumann, S. Crausbay, P.E. Higuera, M.D. Hurteau, A. Tepley, E. Whitman, T. Assal, B.M. Collins, K.T. Davis, S.Z. Dobrowski, D.A. Falk, P.J. Fornwalt, P.Z. Fulé, B.J. Harvey, V.R. Kane, C.E. Littlefield, E.Q. Margolis, M.P. North, M.A. Parisien, S.J. Prichard, and K.C. Rodman. 2020. Wildfire-driven forest conversion in western North American landscapes. BioScience. 70: 659-673. [link]

68. McLauchlan, K.K., P.E. Higuera, J. Miesel, B.M. Rogers, J. Schweitzer, J.K. Shuman, A.J. Tepley, J.M. Varner, T.T. Veblen, S.A. Adalsteinsson, J.K. Balch, P. Baker, E. Batllori, E. Bigio, P. Brando, M. Cattau, M.L. Chipman, J. Coen, R. Crandall, L. Daniels, N. Enright, W.S. Gross, B.J. Harvey, J.A. Hatten, S. Hermann, R.E. Hewitt, L.N. Kobziar, J.B. Landesmann, M.M. Loranty, S.Y. Maezumi, L. Mearns, M. Moritz, J.A. Myers, J.G. Pausas, A.F.A. Pellegrini, W.J. Platt, J. Roozeboom, H. Safford, F. Santos, R.M. Scheller, R.L. Sherriff, K.G. Smith, M.D. Smith, and A.C. Watts. 2020. Fire as a fundamental ecological process: Research advances and frontiers. Journal of Ecology 108:2047-2069 *Featured on JoE's blog. *Highly cited paper [link]

67. #Hoecker, T.J., P.E. Higuera, R. Kelly, and F.S. Hu. 2020. Arctic and boreal paleofire records reveal drivers of fire activity and departures from Holocene variability. Ecology 101: e03096 [link]

66. Pompeani, D.P., K.K. McLauchlan, B.V. Chileen, W.J. Calder, B.N. Shuman, and P.E. Higuera. 2020. The biogeochemical consequences of late Holocene wildfires in three subalpine lakes from northern Colorado. Quaternary Science Reviews 236: 106293. [link]

65. *Bartowitz, K.J., P.E. Higuera, B.N. Shuman, K.K. McLauchlan, and T.W. Hudiburg. 2019. Post-Fire Carbon Dynamics in Subalpine Forests of the Rocky Mountains. Fire 2:58. [link]

64. McWethy, D.B., T. Schoennagel, P.E. Higuera, M.A. Krawchuk, B.J. Harvey, E.C. Metcalf, C.A. Schultz, C. Miller, A.L. Metcalf, B. Buma, A. Virapongse, J.C. Kulig, R.C. Stedman, Z. Ratajczak, C.R. Nelson, and C.A. Kolden. 2019. Rethinking Resilience to Wildfire. Nature Sustainability doi: 10.1038/s41893-019-0353-8 [link]

62. Hessburg, P.F., C.L. Miller, S.A. Parks, N.A. Povak, A.H. Taylor, P.E. Higuera, S.J. Prichard, M.P. North, B.M. Collins, M.D. Hurteau, A.J. Larson, C.D. Allen, S.L. Stephens, H. Rivera-Huerta, C.S.

Stevens-Rumann, L.D. Daniels, Z.E. Gedalof, R.W. Gray, V.R. Kane, D.J. Churchill, R.K. Hagmann, T.A. Spies, C.A. Cansler, R.T. Belote, T.T. Veblen, M.A. Battaglia, C. Hoffman, C.N. Skinner, H.D. Safford, and R.B. Salter. 2019. Climate, Environment, and Disturbance History Govern Resilience of Western North American Forests. Frontiers in Ecology and Evolution 7:239. doi: 10.3389/fevo.2019.00239 [link]

61. Higuera, P.E., A.L. Metcalf, C. Miller, B. Buma, D.B. McWethy, E. C. Metcalf, Z. Ratajczak, C.R. Nelson, B.C. Chaffin, R.C. Stedman, S. McCaffrey, T. Schoennagel, B.J. Harvey, S.M. Hood, C.A. Schultz, A.E. Black, D. Campbell, J.H. Haggerty, R.E. Keane, M.A. Krawchuk, J.C. Kulig, R. Rafferty, and A. Virapongse. 2019. Integrating subjective and objective dimensions of resilience in fire-prone landscapes. BioScience 69: 379-388. *Editor's Choice [link]

60. #Hankin, L.E., P.E. Higuera, @K.T. Davis, and S.Z. Dobrowski. 2019. Impacts of growing- season climate on tree growth and post-fire regeneration in ponderosa pine and Douglas- fir forests. Ecosphere 10(4):e02679 [link]

59. @Davis, K.T., S.Z. Dobrowski, P.E. Higuera, Z.A. Holden, T.T. Veblen, M.T. Rother, S.A. Parks, A. Sala, and M.P. Maneta. 2019. Wildfires and climate change push low-elevation forests across a critical climate threshold for tree regeneration. Proceedings of the National Academy of Sciences 116: 6193-6198. [link]

58. #Young, A.M., P.E. Higuera, J.T. Abatzoglou, P.A. Duffy, and F.S. Hu. 2019. Consequences of climatic thresholds for projecting fire activity and ecological change. Global Ecology & Biogeography 28: 521-532. [link]

57. #Hoecker, T.J., and P.E. Higuera. 2019. Forest succession and climate variability interacted to control fire activity over the last four centuries in an Alaskan boreal landscape. Landscape Ecology 34: 227-241. [link]

56. #Kemp, K.B., P.E. Higuera, P. Morgan, and J.T. Abatzoglou. 2019. Climate will increasingly determine post-fire tree regeneration success in low-elevation forests, Northern Rockies, USA. Ecosphere 10: e02568. doi: 10.1002/ecs2.2568 [link]

55. @Davis, K.T., S.Z. Dobrowski, Z.A. Holden, P.E. Higuera, and J.T. Abatzoglou. 2019. Microclimatic buffering in forests of the future: The role of local water balance. Ecography 41:1-11. *Editor's choice [link]

54. Keane, R.E., R.A. Loehman, L.M. Holsinger, D.A. Falk, P.E. Higuera, S.M. Hood, and P.F. Hessburg. 2018. Use of landscape simulation modeling to quantify resilience for ecological applications. Ecosphere 9:e02414. [link]

53. Hörnberg, G., T. Josefsson, T.H. DeLuca, P.E. Higuera, L. Liedgren, L. Östlund, and I. Bergman. 2018. Anthropogenic use of fire led to degraded scots pine-lichen forest in northern Sweden. Anthropocene 24:14-29. [link]

52. #Hankin, L.E., P.E. Higuera, K.T. Davis, and S.Z. Dobrowski. 2018. Accuracy of node and bud-scar counts for aging two dominant conifers in western North America. Forest Ecology and Management 427:365-371. [link]

51. @Davis, K.T., P.E. Higuera, A. Sala. 2018. Anticipating fire-mediated impacts of climate change using a demographic framework. Functional Ecology. 32: 1729-1745. [link]

50. Morris, J.L., S. Cottrell, C.J. Fettig, R.J. DeRose, K.M. Mattor, V.A. Carter, J. Clear, J. Clement, W.D. Hansen, J.A. Hicke, P.E. Higuera, A.W.R. Seddon, H. Seppä, R.L. Sherriff, J.D. Stednick, and S.J. Seybold. 2018. Bark beetles as agents of change in social-ecological systems. Frontiers in Ecology and the Environment. 16: S34-S43. [link]

49. Stevens-Rumann, C.S., Kemp, K.B., Higuera, P.E., Harvey, B.J., Rother, M.T., Donato, D.C., Morgan, P. & Veblen, T.T. 2018. Evidence for declining forest resilience to wildfires under climate change. Ecology Letters. 21: 243-252. [link]

48. Hudiburg, T.W., P.E. Higuera, and J.A. Hicke. 2017. Fire-regime variability impacts forest carbon dynamics for centuries to millennia. Biogeosciences. 14: 3873-3882. [link]

47. McLauchlan, K.K., L.M. Gerhart, J.J. Battles, J.M. Craine, A.J. Elmore, P.E. Higuera, M.C. Mack, M.C., B.E. McNeil, D.M. Nelson, N. Pederson, S.S. Perakis. 2017. Centennial- scale reductions in nitrogen availability in temperate forests of the United States. Scientific Reports. 7: 7856. doi:10.1038/s41598-017-08170-z [link]

46. Itter, M.S., A.O. Finley, M.B. Hooten, P.E. Higuera, J.R. Marlon, R. Kelly, and J.S. McLachlan. 2017. A model-based approach to wildland fire reconstruction using sediment charcoal records. Environmetrics. 28: e2450. [link]

45. Crausbay, S.D., P.E. Higuera, D.G. Sprugel, and L.B. Brubaker. 2017. Fire catalyzed rapid ecological change in lowland coniferous forests of the Pacific Northwest over the past 14,000 years. Ecology. 98: 2356-2369 [link]

44. @Morris, J.L., P.E. Higuera, S. Haberle, and C. Whitlock. 2017. Modern pollen from small hollows reflects Athrotaxis cupressoides density across a wildfire gradient in subalpine forests of the Central Plateau, Tasmania, Australia. The Holocene. 27: 1781-1788. [link]

43. @Morris, J.L., S. Cottrell, C.J. Fettig, W.D. Hansen, R.L. Sherriff, V.A. Carter, J.L. Clear, J. Clement, R.J. DeRose, J.A. Hicke, P.E. Higuera, K.M. Mattor, A.W.R. Seddon, H.T Seppä, J.D. Stednick, S.J. Seybold. 2017. Managing bark beetle impacts on ecosystems and society: priority questions to motivate future research. Journal of Applied Ecology. 54: 750-760. [link]

42. #Young, A.M., Higuera, P.E., Duffy, P.A., and F.S. Hu. 2017. Climatic thresholds shape northern high-latitude fire regimes and imply vulnerability to future climate change. Ecography. 40: 606-617. [link]

41. Leys, B., P.E. Higuera, K.K. McLauchlan, and P.V. Dunnette#. 2016. Wildfires and geochemical change in a subalpine forest over the past six millennia. Environmental Research Letters. 11: 125003. [link]

40. Johnstone, J.F., C.D. Allen, J.F. Franklin, L.E. Frelich, B.J. Harvey, P.E. Higuera, M.C. Mack, R.K. Meentemeyer, M.R. Metz, G.L.W. Perry, T. Schoennagel, and M.G. Turner. 2016. Changing disturbance regimes, ecological memory, and forest resilience. Frontiers in Ecology and the Environment. 7: 369-378. *Highly cited paper [link]

39. Marlon, J.R., R. Kelly, A.L. Daniau, B. Vannière, M.J. Power, P. Bartlein, P.E. Higuera, O. Blarquez, S. Brewer, and T. Brücher. 2016. Reconstructions of biomass burning from sediment-charcoal records to improve data–model comparisons. Biogeosciences 13:3225- 3244. [link]

38. Kranabetter, J.M., K.K. McLauchlan, S.K. Enders, J.M. Fraterrigo, P.E. Higuera, J.L. Morris, E.B. Rastetter, R. Barnes, B. Buma, D.G. Gavin, L.M. Gerhart, L. Gillson, P. Hietz, M.C. Mack, B. McNeil, and S. Perakis. 2016. Temporal scaling of biogeochemical response to ecosystem disturbance. Ecosystems. 19: 387-395. [link]

37. Abbot, B.W., J.B. Jones, E.A.G. Schuur, F.S. Chapin III, and 96 others including P.E. Higuera. 2016. Biomass offsets little or none of permafrost carbon release from soils, streams, and wildfire: an expert assessment. Environmental Research Letters. 11: 034014 [link]

36. Tinkham, W.T., A.M.S. Smith, P.E. Higuera, J.A. Hatten, N.W. Brewer, and S.H. Doerr. 2016. Replacing time with space: using laboratory fire to explore the effects of repeated burning on black carbon degradation. International Journal of Wildland Fire. 25: 242- 248. [link]

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33. Hu, F.S., P.E. Higuera, P.A. Duffy, M.L. Chipman, A.V. Rocha, #A.M. Young, R. Kelly, and M.C. Dietze. 2015. Tundra fires in the Arctic: Natural variability and responses to climate change. Frontiers in Ecology and the Environment, 13: 369-377. [link]

32. Higuera, P.E., J.T. Abatzoglou, J.S. Littell, and P. Morgan. 2015. The changing strength and nature of fire-climate relationships in the northern Rocky Mountains, U.S.A., 1902- 2008. PLoS ONE, 10:e0127563. [link]

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30. Klos, P.Z., J. Abatzoglou, A. Bean, J. Blades, M.A. Clark, M. Dodd, T.E. Hall, A. Haruch, P.E. Higuera, J.D. Holbrook, V.S. Jansen, #K. Kemp, A. Lankford, T.E. Link, T. Magney, A.J.H. Meddens, L. Mitchell, B. Moore, P. Morgan, B.A. Newingham, R.J. Niemeyer, B. Soderquist, A.A. Suazo, K.T. Vierling, V. Walden, and C. Walsh. 2015. Indicators of climate change in Idaho: An assessment framework for coupling biophysical change and social perception. Weather, Climate, and Society, 7, 238-254. [link]

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26. McLauchlan, K., P.E. Higuera, D.G. Gavin, S. S. Perakis, M.C. Mack, H. Alexander, J. Battles, F. Biondi, B. Buma, D. Colombaroli, S. Enders, D.R. Engstrom, F.S. Hu, J.R. Marlon, J.D. Marshal, M. McGlone, J.L. Morris, L.E. Nave, B.N. Shuman, E.A.H. Smithwick, D.H. Urrego, D.A. Wardel, C.J. Williams, and J.J. Williams. 2014. Reconstructing disturbances and their biogeochemical consequences over multiple timescales. BioScience. 64: 105-116. [link]

25. *Kelly, R. F., *M.L. Chipman, P.E. Higuera, V. Stefanova, L.B. Brubaker, and F.S. Hu. 2013. Recent burning of boreal forests exceeds variability of the past 10,000 years. Proceedings of the National Academy of Sciences, 110: 13055-13060. [link]

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14. Ali, A.A., P.E. Higuera, Y. Bergeron, and C. Carcaillet. 2009. Comparing fire-history interpretations based on area, number and estimated volume of macroscopic charcoal in lake sediments. Quaternary Research 72: 462-486. [link]

13. Marlon, J.R., P.J. Bartlein, M.K. Walsh, S.P. Harrison, K.J. Brown, M.E. Edwards, P.E. Higuera, M.J. Power, C. Whitlock, R.S. Anderson, C. Briles, A. Brunelle, C. Carcaillet, M. Daniels, F.S. Hu, M. Lavoie, C. Long, T. Minckley, P.J.H. Richard, S.L. Shafer, W. Tinner, and C. Umbanhowar. 2009. Wildfire responses to abrupt climate change in North America. Proceedings of the National Academy of Sciences 106: 2519-2524. [link]

12. Brubaker, L.B., P.E. Higuera, T.S. Rupp, M. Olson, P.M. Anderson, and F.S. Hu. 2009. Linking sediment charcoal records and ecological modeling to understand causes of past fire-regime change in boreal forests. Ecology 90: 1788-1801. [link]

11. Higuera, P.E., L.B. Brubaker, P.M. Anderson, F.S. Hu, and T.A. Brown. 2009. Vegetation mediated the impacts of postglacial climate change on fire regimes in the south-central Brooks Range, Alaska. Ecological Monographs 79: 201-219. [link]

10. Marlon, J.R., P.J. Bartlein, C. Carcaillet, D.G. Gavin, S.P. Harrison, P.E. Higuera, F. Joos, M.J. Power, and I.C. Prentice. 2008. Climate and human influences on global biomass burning over the past two millennia. Nature Geoscience 1: 697-702. [link]

9. Briles, C.E., C. Whitlock, P.J. Bartlein, and P.E. Higuera. 2008. Regional and local controls on postglacial vegetation and fire in the Siskiyou Mountains, northern California, USA. Palaeogeography Palaeoclimatology Palaeoecology 265: 159-169. [link]

8. Higuera, P.E., L.B. Brubaker, P.M. Anderson, T.A. Brown, A.T. Kennedy, and F.S. Hu. 2008. Frequent Fires in Ancient Shrub Tundra: Implications of Paleorecords for Arctic Environmental Change. PLoS ONE 3:e0001744. [link]

7. Sugimura, W., D.G. Sprugel, L.B. Brubaker, and P.E. Higuera. 2008. Millennial-scale changes in local vegetation and fire regimes on Mt. Constitution, Orcas Island, Washington, USA, using small hollow sediments. Canadian Journal of Forest Research 38: 566-575. [link]

6. Power, M.J., and 84 others including P.E. Higuera. 2008. Changes in fire regimes since the Last Glacial Maximum: an assessment based on a global synthesis and analysis of charcoal data. Climate Dynamics 30: 887-907. [link]

5. Higuera, P.E., M.E. Peters, L.B. Brubaker, and D.G. Gavin. 2007. Understanding the origin and analysis of sediment-charcoal records with a simulation model. Quaternary Science Reviews 26:1790-1809. [link]

4. Peters, M.E., and P.E. Higuera. 2007. Quantifying the source area of macroscopic charcoal with a particle dispersal model Quaternary Research 67:304-310. [link]

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2. Higuera, P.E., D.G. Sprugel, and L.B. Brubaker. 2005. Reconstructing fire regimes with charcoal from small-hollow sediments: a calibration with tree-ring records of fire. The Holocene 15:238-251. [link]
1. Trombulak, S.C., P.E. Higuera, and M. DesMeules. 2001. Population trends of wintering bats in Vermont. Northeastern Naturalist 8:51-62. [link]

NON-REFEREED AND PUBLIC-FACING PUBLICATIONS

*Includes invited editorials, public-facing summaries (e.g., The Conversation), commissioned reports, and book chapters. Public-facing pieces flagged with *Invited.*

19. Clark-Wolf, K.D. and Higuera, P.E. What 2,500 years of wildfire evidence and the extreme fire seasons of 1910 and 2020 tell us about the future of fire in the West. The Conversation. October 17, 2023. *Invited public-facing summary
18. Davis, K.T., Peeler, J., and Higuera, P.E. The West's iconic forests are increasingly struggling to recover from wildfires – altering how fires burn could boost their chances. The Conversation. March 6, 2023. *Invited public-facing summary
17. Higuera, P.E., Cook, M.C., Balch, J.K., Stavros, E.N. 2023. Western wildfires destroyed 246% more homes and buildings over the past decade – fire scientists explain what's changing. The Conversation. Feb. 1, 2023. *Invited public-facing summary
16. #Wolf, K.D., K.T. Davis, and P.E. Higuera. 2022. Wildfire effects on microclimate conditions and tree regeneration in mixed conifer forests. Northern Rockies Fire Science Network Research Brief 15:3.
15. Higuera, P.E., Crausbay, S., Shuman, B.N., #Wolf, K.D. 2022. Challenges to Forest Restoration in an Era of Unprecedented Climate and Wildfire Activity in Rocky Mountain Subalpine Forests. Past Global Changes Magazine, 30: 30-31. *Invited contribution
14. Miller, C., Higuera, P.E., McWethy, D.B., Metcalf, A.L., Metcalf, E.C., Black, A.E.; Clarke, L., Hodge, H. 2021. Developing strategies to support social-ecological resilience in flammable landscapes: A structured approach for natural resource managers and other stakeholders. Research Note RMRS-RN-92. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 41 p.
13. Higuera, P.E., Metcalf, A.L., McWethy, D.B., Balch, J.K. Skip the fireworks this record-dry Fourth of July, over 150 wildfire scientists urge the US West. The Conversation. June 30, 2021. *Invited. Covered on NRP Weekend Edition.
12. Higuera, P.E., Shuman, B.N., and #Wolf, K.D. 2021. Rocky Mountain forest burning more now than any time in the past 2,000 years. The Conversation. June 14, 2021. *Invited public-facing summary.
11. Higuera, P.E., and Abatzoglou, J.T. 2021. Record-setting climate enabled the extraordinary 2020 fire season in the western United States. Global Change Biology, 27: 1-2 doi:10.1111/gcb.15388 *Invited Editorial
10. Higuera, P., Dodson, E., Metcalf, A., and Dobrowski, S. September 22, 2020. There will be more wildfire. What should we do? The Washington Post *Invited Opinion
9. Higuera, P.E. 2019. First- and Second-order Fire Effects. In: Manzello S. (eds) Encyclopedia of Wildfires and Wildland-Urban Interface (WUI) Fires. Springer. https://link.springer.com/referencework/10.1007/978-3-319-51727-8
8. Higuera, P., Hoffmann, H.M., Miller, S.R., and Saxer, S.R. 2019. Climate change, population demographics, and wildfire planning in the West. Trends, the e-newsletter of the American Bar Association's Environment, Energy, and Resources Section.
7. Higuera, P.E, A.J. Larson, and E.C. Metcalf. October 28, 2017. Learning to live with Western wildfires. Bozeman Daily Chronicle, Bozeman, MT. *Invited Opinion

6. Higuera, P.E. 2015. Taking time to consider the causes and consequences of large wildfires. Proceedings of the National Academy of Sciences. 112: 13137-13139. *Invited Editorial
5. Higuera, P. E., J. L. Barnes, M. L. Chipman, M. Urban, and F. S. Hu. 2011. Tundra fire history over the past 6000 years in the Noatak National Preserve, northwestern Alaska. Alaska Park Science 10:37-41.
4. McWethy D.B., S.T. Gray, P.E. Higuera, J.S. Littell, G.T. Pederson, A.J. Ray, and C. Whitlock. 2010. Climate and terrestrial ecosystem change in the U.S. Rocky Mountains and Upper Columbia Basin: Historical and future perspectives for natural resource management. Natural Resource Report NPS/GRYN/NRR—2010/260. National Park Service, Fort Collins, Colorado.
3. Higuera, P.E., D.G. Gavin, P.D. Henne, and R.F. Kelly. 2010. Recent advances in the analysis and interpretation of sediment-charcoal records. PAGES Newsletter, 18: 57-59.
2. Higuera, P. E. 2006. Late Glacial and Holocene Fire History in the Southcentral Brooks Range, Alaska: Direct and Indirect Impacts of Climatic Change on Fire Regimes. Ph.D. Dissertation. University of Washington, Seattle.
1. Higuera, P. E. 2002. Reconstructing fire regimes with charcoal and pollen from small hollows: a calibration with tree-ring records of fire. MS Thesis. University of Washington, Seattle.

INVITED LECTURES AND SEMINARS

2023	University of Montana, Geosciences seminar series
2022	University of Montana, Forestry and Conservation seminar series
2022	University of Wyoming, Dep. of Geology, Distinguished Speakers Series
2021	Pennsylvania State University, Earth Talks seminar series
2021	University of Montana, Health Sciences seminar series
2021	Rocky Mountain Biological Laboratory, summer seminar series
2021	International Paleofire Network Seminar Series
2019	USFS, Missoula Fire Science Lab Seminar Series
2018	Department of Earth Sciences, Montana State University
2017	USFS, Missoula Fire Science Lab Seminar Series
2016	Systems Ecology Graduate Seminar Series, University of Montana
2015	Department of Ecosystem and Conservation Sciences, University of Montana
2014	Department of Geography Climate Change Seminar, University of Idaho
2014	Department of Geography departmental seminar, University of Utah
2012	Paleoworks Master Class on charcoal analysis, Australian National University, Canberra, Australia
2012	Webinar to fire managers, JFSP-funded Alaska Fire Science Consortium: “Tundra burning in Alaska: rare events or harbinger of climate change?” May 24th
2011	Forest Ecology Seminar Series, University of Montana
2010	Keynote speaker, Bonanza Creek LTER Symposium, Fairbanks, Alaska
2009	Quaternary Ecosystem Science Training International Group, guest lecturer, France
2009	Department of Biology, University of Denver
2008	Department of Geography, University of Wisconsin
2007	Department of Ecology, Montana State University
2007	Department of Geography, University of Oregon
2006	Department of Earth Sciences, Montana State University

SELECTED PROFESSIONAL PRESENTATIONS

*Selected from over 100 conference presentations. * indicates an invited talk; # graduate student directly advised; @ postdoctoral researcher.*

*Higuera, P.E., M.W. Cook, J.K. Balch, E.N. Stavros, A. Mahood, and L.A. St Denis. 2023. “Shifting social-ecological fire regimes explain rapidly increasing home and structure loss from Western wildfires.” 10th International Fire Ecology and Management Congress, Monterey, California (talk).

*Higuera, P.E. Fire, climate change, and the resilience of Rocky Mountain forests. 2022. “Fire impacts at the Earth surface across space and time” a conference by the European Geosciences Union Galileo, Bad Belzig, Germany, 28 March – 1 April.

*Higuera, P.E., B.N. Shuman, #K.D. Wolf Rocky Mountain subalpine forests now burning more than any time in recent millennia. 2021. Annual meeting of the Ecological Society of America, Cyberspace. (talk)

*@Davis, K. T., P. E. Higuera, S. Z. Dobrowski, Z. A. Holden, T. T. Veblen, M. T. Rother, and S. A. Parks. 2019. Low-elevation forests have crossed critical climate thresholds for post-fire tree recruitment. Annual meeting of the North American Chapter of the International Association of Landscape Ecology, Fort Collins, CO. (talk)

*@Davis, K. T., P. E. Higuera, S. Z. Dobrowski, and #K. D. Wolf. 2019. Fuel treatments as a means for mitigating fire-catalyzed forest change. 8th International Fire Ecology and Management Congress, Tucson, AZ. (talk)

Miller, C., Black, A., Higuera, P.E., Metcalf, E.C., Metcalf, A.L., McWethy, D.M, and Clarke, L. Demystifying Resilience to Wildfire. 2019. A Fire Circle presentation (90-min.) at the 8th International Fire Ecology and Management Congress, Tucson, AZ. (workshop)

*Higuera, P. E., T. W. Hudiburg, K. Bartowitz, K. K. McLauchlan, B. N. Shuman, #K. D. Wolf, D. P. Pompeani, B. Chileen, and M. Parish. 2019. The Big Burns Project: Causes and Consequences of Fire-regime Variability in Rocky Mountain Subalpine Forests. 20th Congress of the International Quaternary Association, Dublin, Ireland. (talk)

Higuera, P. E., T. W. Hudiburg, K. Bartowitz, K. K. McLauchlan, B. N. Shuman, #K. D. Wolf, D. P. Pompeani, B. Chileen, and M. Parish. 2018. A framework for understanding, testing, and anticipating the ecosystem consequences of wildfire activity over space and time. Annual fall meeting of the American Geophysical Union, San Francisco, CA. (talk)

Higuera, P.E., T.W. Hudiburg, K.M. McLauchlan, B.A. Shuman, J.A. Hicke. 2017. Causes and Consequences of Fire-regime Variability in Rocky Mountain Subalpine Forests. Annual meeting of the Ecological Society of America, Portland, OR. (poster)

#Hankin, L.E., P.E. Higuera, @K.T. Davis, and S.Z. Dobrowski. 2017. Seasonal to annual climate impacts post-fire conifer regeneration in the Northern Rockies. 102nd Annual meeting of the Ecological Society of America, Portland, OR. (poster)

*Higuera, P.E. 2016. Coupled climate-fire-ecosystem dynamics from decades to millennia. Fall Meeting, American Geophysical Union, San Francisco, CA. (talk)

Higuera, P.E., T.W. Hudiburg, and J.A. Hicke. 2015. Combining paleoecology and ecosystem modeling to study forest ecosystem consequences of wildfires from decades to millennia. Fall Meeting, American Geophysical Union, San Francisco, CA. (talk)

#Hoecker, T.J., F.S. Hu, R. Kelly, and P.E. Higuera. 2015. Spatiotemporal Trends in late- Holocene Fire Regimes in Arctic and Boreal Alaska. Annual meeting of the American Geophysical Union, San Francisco, CA. (talk) *Outstanding Student Paper Award

*Higuera, P.E. 2015. Taking time to consider the causes and ecosystem consequences of fire- regime variability. 6th International Fire Ecology and Management Congress, San Antonio, TX. (talk)

#Young, A.M., P.E. Higuera, P.A. Duffy, F.S. Hu, and L. Boschetti. 2014. Climatic Controls of Wildfire in the Boreal Forest and Arctic Tundra Biomes across Multiple Spatial and Temporal Scales. Fall Meeting, American Geophysical Union, San Francisco, CA. (talk)

*Higuera, P. E., Calder, W.J., Chipman, M., Gill, J., and R. Kelly. 2014. IGNITE: Why we study the past: PaleoEcology in a time of rapid global change. Annual meeting of the Ecological Society of America, Sacramento, CA. (talk)

Crausbay, S., Higuera, P.E., Brubaker, L.B., and Sprugel, D.G. 2014. Fire as a catalyst for rapid ecological change in the Puget Lowlands over the Holocene. Annual meeting of the Ecological Society of America, Sacramento, CA. (talk)

#Kemp, K.B., Higuera, P.E., and Morgan, P. 2014. Post-fire tree recruitment in the U.S. Northern Rockies: the influence of seed source proximity and environmental conditions. Annual meeting of the Ecological Society of America, Sacramento, CA. (talk)

*@Morris, J.L. and P.E. Higuera. 2014. Holocene fire histories from the subalpine interior of Tasmania, Australia. International Association of Wildland Fire: Large Wildland Fires: Social, Political and Ecological Effects, Missoula, MT. (talk)

*Higuera, P.E., R.F. Kelly, and F.S. Hu. 2013. Resilience and sensitivity of high-severity fire regimes to climatic variability from centuries to millennia. Fall Meeting, American Geophysical Union, San Francisco, CA. (talk)

*Higuera, P.E., J.T. Abatzoglou, J.S. Littell, and P. Morgan. 2013. The changing nature of fire- climate relationships in the U.S. Northern Rockies, 1902-2008. VII Southern Connection Congress, Dunedin, New Zealand. (talk)

#Dunnette, P.V. and P.E. Higuera. Long-term interactions among climate, fire, and biogeochemical cycling in a Rocky Mountain subalpine watershed. Ecological Society of America, Portland, OR. (poster)

Higuera, P.E., M. Chipman, J. Barnes, P.A. Duffy, and F.S. Hu. 2011. Interannual- to millennial-scale interactions among climate, vegetation, and fire in tundra ecosystems of Alaska, USA. Ecological Society of America, Austin, TX. (talk)

*Higuera, P.E., M. Chipman, J.A. Allen, L. Brubaker, C. Whitlock, F.S. Hu. 2009. Interactions of climate, vegetation, and fire during the Holocene: lessons from high-latitude and high- elevation ecosystems. American Geophysical Union, San Francisco, CA. (talk)

*Higuera, P.E., M. Chipman, J.A. Allen, S. Rupp, M. Urban, F.S. Hu. 2008. Tundra fire regimes in the Noatak National Preserve, northwestern Alaska, since 6000 yr BP. International Association of Wildland Fire, Jackson Hole, WY. (talk)

Higuera, P.E., L.B. Brubaker, P.M. Anderson, F.S. Hu, B. Clegg, T. Brown, and S. Rupp. 2005. The relative importance of vegetational vs. climatic controls on post-glacial fire regimes in the southern Brooks Range, AK. Ecological Society of America, Montreal, Quebec. (talk)

*Higuera, P.E., M.E. Peters, D.G. Gavin. 2004. Holocene fire-history records from lake sediments: improving accuracy and precision through quantitative modeling. International Association for Landscape Ecology, US Regional Association, Las Vegas, Nevada. (talk)

Higuera, P.E., L.B. Brubaker, and D.G. Sprugel. 2002. Reconstructing fire regimes with small hollows: A calibration with tree-ring records. Ecological Society of America, Tucson, AZ. (talk)

SCIENCE COMMUNICATION: MANAGERS, POLICY MAKERS, AND PUBLIC

Over a dozen invited talks since 2016 to natural-resource managers, policy makers, journalists, and the general public. [link] markers point to recordings or session pages where available.

March, 6, 2025: Invited keynote speaker for the IEEE Aerospace Conference, Big Sky, MT, “Wildfires are inevitable. How can we reduce human suffering?” [link]

June 13, 2024: Invited panel presenter for the National Academies of Sciences workshop “The Social-Ecological Consequences of Future Wildfire in the West” (@ 1:25). [link]

March 3, 2022: Invited presenter (1 of 3) for the Montana State Legislature’s Environmental Quality Council meeting, as part of a 1-hr session on “Wildfire Behavior and Mitigation.” [link]

Sep. 16, 2021: Invited panelist/presenter (1 of 3) for the Cary Institute of Ecosystem Studies' virtual public event "Wildfire in the Western US: Causes, Consequences, & Adaptation" [link]

Sep. 1, 2021: Invited panelist/presenter (1 of 3) for the SciLine media brief titled "Wildfires: Climate connections & community impacts," including a national audience of journalists. [link]

March 4, 2021: Invited public presentation, Aspen Center for Environmental Studies' Naturalist's Nights, "Colorado's record-setting 2020 fire season in the context of the past 6000 years" [link]

Dec. 8, 2020: Invited public presentation, "The past and future ecological effects of wildfire," as part of a public session, "Wildfire and Wildfire Smoke: Effects on ecosystems, agricultural works, horses, and wine grapes," The National Academies of Sciences, Engineering, Medicine, Board on Agriculture and Natural Resources. [link]

July 9, 2020: Public lecture "Wildfire and Climate Change in the West" delivered to audience over two dozen participants, organized by the Bitterroot Climate Action Group.

April 5, 2019: Presenter and panelist at a wildfire workshop for journalists, organized by the Institute for Journalism & Natural Resources, including over two dozen local and regional journalists.

May 30, 2019: Invited presentation for the 19th Institute for Natural Resources Law Teachers, Missoula, MT: The Inevitability of wildfire in the West: past, present, and future

May 31, 2019: Participant, one-day workshop titled "Climate Ready Communities: building Resiliency in Missoula County," sponsored by the Missoula Chamber of Commerce, Climate Smart Missoula, and the City of Missoula. I was invited to attend this workshop to contribute to wildfire-related topics.

May, 2020: Presenter and panelist at a wildfire workshop for journalists, organized by the Institute for Journalism & Natural Resources, including over two dozen national journalists.

February 27, 2018: Talk, UM's Community Lecture Series, The inevitability of wildfires: fire history and the future of fire.

April 20, 2018: Presenter and panelist at "The Future of Wildfire," a workshop organized by the Institute for Journalism & Natural Resources, including 23 local and regional journalists.

October 14, 2018: Presenter at the "Science of National Forest Planning Symposium," organized by the Custer-Gallatin National Forest as part of their Forest Plan revision process: Changing Fire Regimes and Forest Resilience: past, present, and future

November 7, 2018: Talk, "Science on Tap," Flathead Lake Brewery: The Inevitability of wildfire in the West: past, present, and future

October 2017: Panelist, "Living with Fire" public evening event, sponsored by the Missoula- based non-profit Treesource.org, dedicated to "forest journalism for a sustainable future."

July 2016: Presenter and participant, "Learning from a Legacy of Wilderness Fire in the Bob Marshall Wilderness Complex" workshop, Spotted Bear Ranger Station, sponsored by the Northern Rockies Fire Science Network.

2013: DeVleig Distinguished Lecturer Series, McCall Outdoor Science School, University of Idaho.

SCIENCE COMMUNICATION: MEDIA COVERAGE

Coverage since 2016: primary coverage of research, expert input, podcasts, and op-eds. Each [link] points to the original article, broadcast, or recording.

November 2025: "Analysis: Forest Service going 'full suppression' on wildfires despite fuels build-up" The Bozeman Daily Chronicle [link]

October 2025: "What happens to wildlife during a wildfire?" The Big Why, Montana Public Radio, [link]

January 2025: "As Big Sky firefighters return from L.A. wildfires, experts warn of growing risk at home" Explore Big Sky. [link]

August 2024: "These Oregon ranchers say the losses from summer range fires will be huge" NPR National News. [link]

March 2024: “Montana researchers say quick wildfire suppression leads to larger, more intense fires” Daily Montanan. [link]

Aug. 2023: “5 ‘surprising’ areas where wildfire risk is increasing” The Hill. [link]

March 2023: “Increasingly Large and Intense Wildfires Hinder Western Forests’ Ability to Regenerate” Inside Climate News. [link]

Feb. 2023: “Why Western wildfires are becoming more destructive” High Country News, reposting our piece in The Conversation. [link]

Feb. 2023: “The rate of structure loss due to wildfires is growing, researcher says,” Montana Public Radio. [link]

Feb. 2023: “Because of humans, wildfires are burning more homes,” The Missoulian. [link]

Jan. 2023: “In a warming world, California’s trees keep dying,” High Country News. [link]

March 2022: “Wildfire trends outpace mitigation measures” Bozeman Daily Chronicle. [link]

Jan. 2022: “How climate change primed Colorado for a rare December wildfire” NBC News [link]

Feb. 2022: “Ep. 24: Climate change impacts on high severity, low frequency fire regimes with Phil Higuera” Life with Fire podcast, by Amanda Monthei. [link]

Dec. 2021: “How climate change intensified Colorado fires” The Washington Post [link]

Dec. 2021: “A rare winter wildfire is a sign of climate change lengthening fire season” Montana Public Radio [link]

Oct. 2021: “La Niña is about to take the Southwest drought from bad to worse” CNN [link]

July 2021: “The Climate Change Link to More and Bigger Wildfires” Montana Public Radio. [link]

July 2021: “These Fires ARE Different, with Phil Higuera and Kyra Wolf” A New Angle podcast. [link]

July 2021: “Fire scientists report record low fuel moisture in western Montana,” NBC Montana. [link]

July 2021: “Skip the fireworks this record-dry July 4th, fire scientists urge the U.S. West,” PBS News Hour, reposting our piece in The Conversation. [link]

July 2021: “Experts recommend leaving fireworks unlit this 4th of July,” National Public Radio. [link]

July 2021: “Today’s Wildfires Are Taking Us into Uncharted Territory” Scientific American. [link]

June 2021: “High-elevation forests now burning more frequently than any time in the past 2,000 years” Montana Free Press [link]

June 2021: “Fire Ecology Professor Says Ecosystem In ‘Uncharted Territory’” Montana Public Radio [link]

June 2021: “Rocky Mountain Forest Fires More Frequent Than Ever, Study Finds” Voice of America [link]

June 2021: “High-elevation forests in the Rockies are burning more now than in the past 2,000 years” CNN [link]

October 2020: “Living with fire: Officials, environmentalists wrestle with how to best manage forests,” The Bozeman Daily Chronicle. [link]

October 2020: “Off the charts: Dryness stat shows why West is burning” E&E News [link]

October 2020: “Colorado contends with record-setting wildfires,” ClimateWire. [link]

October 2020: “Late-Season Wildfires Rampage Through Colorado,” The New York Times. [link]

September 2020: “The science connecting wildfires to climate change” National Geographic [link]

September 2020: “The new normal? Fire watchers fear we’re just getting started,” Missoulian. [link]

September 2020: “How an easterly wind, hotter summers could fuel more devastating wildfire on Western slopes of Cascades,” Seattle Times. [link]

September 2020: “The science connecting wildfires to climate change,” National Geographic. [link]

July 2020: “Full-court Suppress,” Montana Free Press. [link]

May 2020: “Scientists Are Bringing Their Research Home During COVID-19 Closures” Montana Public Radio. [link]

October 2019: “Ecologist Helps Redefine Our Perspective on Forest Fires,” Features in “Stories from the field” series by the non-profit organization Engineers & Scientists Acting Locally. [link]

August 2019: “Why the Arctic is smoldering,” BBC Future. [link]

July 2019: “Withstanding wildfire with words: study seeks best ways to recover,” Missoulian. [link]

June 2019: “Wildfire smoke is here to stay,” Outside Magazine. [link]

March 2019: “Fire study shows landscapes such as Bitterroot’s Sapphire Range too hot, dry to restore trees,” Missoulian. [link]

January 2019: “Why the shutdown could mean a worse wildfire season,” NPR News. [link]

Feb. 2018: “New study Finds Climate Change Reducing Forest Regrowth After Fires,” Montana Public Radio. [link]

September 2018: “Will more logging ease wildfires? Canada holds answers,” Wyoming Public Media [link]

November 2017: “Collaborative Group Seeks Consensus After Montana's Summer of Smoke” Montana Public Radio [link]

November 2017: The controversies that defined the 2017 fire season—and foreshadow the fires next time, Missoula Independent

October 2017: “Get used to it: Fire experts warn summer smoke and flames aren't going away,” The Missoulian [link]

October 2017: 'Gone are the days we can overwhelm a fire with mass' in the Great Falls Tribune. [link]

October 2017: “Get used to wildfire, and rethink 'natural processes' panelists say” Montana Public Radio. [link]

October 2017: “The $2 billion question: spend on fighting fires or preventing them?” Market Place, American Public Media [link]

September 2017: “Zinke's fire memo calls for aggressive forest thinning,” High Country News. [link]

September 2017: “The West’s dramatic wildfire season, explained,” High Country News. (Re- publishing of the CityLab piece) [link]

September 2017: “The West is on fire. Get used to it,” CityLab. [link]

May 2016: “Global Warming to Spur More Fires in Alaska, in Turn Causing More Warming,” Inside Climate News [link]

UNIVERSITY TEACHING

University of Montana, College of Forestry and Conservation

Professor 2021–present; Associate Professor 2015–2021

Fire Ecology (FORS 333, 3 cr); annually since 2015

Fire Management and Environmental Change (FORS 230, 3 cr); annually since 2017 (taught solo in 2017 and 2026; 1.5 credits co-taught otherwise)

Elements of Ecological Restoration (NRSM 265, 3 cr); co-taught 1–2 credits, annually 2015–2024

Fire and Disturbance Ecology (FORS 595, 3 cr); 2017, 2019, 2021, 2023, 2025

Living with Wildfire (FORS 595-ST); 2020 (1 cr), 2024 (2 cr)

University of Idaho, College of Natural Resources

Assistant Professor 2009–2015

Fire Ecology and Management (FOR 326/426, 3 cr); annually 2010–2014

Fire Behavior (FOR 450, 3 cr); annually 2010–2015

Computational Data Analysis and Visualization (FOR 504, 3 cr); 2012, 2014

Altered Ecologies (FOR 504-02, 3 cr); 2013

Global Fire and Ecological Feedbacks (FOR 504-02, 3 cr); 2011

Montana State University, Department of Earth Sciences

Adjunct Instructor 2007–2009

Biogeography (GEOG 302); 2008 (co-instructor), 2009

Weather and Climate (GEOG 303); 2008

Mountain Geography (GEOG 430); 2008

Advanced Biogeography (GEOG 505); 2009

Guest lectures

35+ guest lectures (1–3 per year) in courses spanning forest ecology, climate change, ecological restoration, environmental sciences, and geoscience.

POSTDOCTORAL, GRADUATE, AND UNDERGRADUATE MENTORING

Postdoctoral researchers (5)

William "Buzz" Nanavati (2023–present); Jamie Peeler (2021); Kimberly Davis (2016–2020); Jesse Morris (2013–2015); Kelly Derr (2013–2014).

Graduate students, primary advisor (7)

Completed

Kyra Clark-Wolf (PhD, Systems Ecology, U of MT, 2017–2022); Paul Dunnette (MS, U of ID, 2010–2013); Lacey Hankin (MS, Systems Ecology, U of MT, 2016–2018); Tyler Hoecker (MS, U of ID and U of MT, 2014–2017); Kerry Kemp (PhD, U of ID, 2010–2015); Spencer Vieira (MS, Systems Ecology, U of MT, 2021–2023); Adam Young (PhD, MS in Statistical Science, U of ID, 2011–2018).

Graduate students, committee member (23)

Past

Hannah Alverson (MS, Systems Ecology, UM, 2023–2025); Carolyn Barrett (PhD, U of IL, 2006–2012); Kristina Bartowitz (PhD, U of ID, 2017–2022); Julia Berkey (MS, U of MT, 2018–2020); Nolan Brewer (MS, U of ID, 2009–2012); Polly Buotte (PhD, U of ID, 2014–2015); David Busby (Geosciences, UM, 2021–2022); Mark Kreider (PhD, Systems Ecology, UM, 2021–2024); Carl Davidson (MS, U of IL, 2011–2012); Haley Hodge (MS, U of MT, 2018–2020); Melissa Jaffe (MS, U of MT, 2020–2022); Ryan Kelly (PhD, U of IL, 2008–2014); Katie Morrison (MS, U of ID, 2012–2014); Lauren Perreault (MS, ID State Univ., 2009–2010); Seff Propios (MS, U of MT Geography, 2019–2020); Robin Rank (MS, U of MT, 2019–2021); Charlotte Reed (PhD, Ecology and Evolutionary Biology, UM, 2021–2025); Vanessa Selimovic (PhD, Chemistry, U of MT, 2015–2020); Kara Yedinak (PhD, Atmospheric Science, WA State Univ., 2009–2013).

Current

Brooke Bannerman (PhD, Ecology and Evolutionary Biology, UM, 2022–); Gibson Blankenship (Systems Ecology, UM, 2024–); Sophia Graham (PhD, Society and Conservation, UM, 2024–); Milan Vinks (PhD, Wildlife Biology, UM, 2023–).

Undergraduate research projects and theses (13)

Junior Burks (UM, Davidson Honors College, Environmental Science and Sustainability, 2023–2024); Madison Miller (UM, Davidson Honors College, Chemistry, 2020–2021); Allison Hendrix (UM, Wildlife Biology, 2018–2019); Lawrence Crofutt (UM, Forestry, 2017–2018); Lucas Townsend (UM, Forestry, 2016–2017); Cassidy Robertson (Ecology and Conservation Biology, U of ID, 2014–2015); Patrick Flannigan (Environmental Science, U of ID, 2013); Shannon Pauli (Fire Ecology and Management, U of ID, 2012–2013); Cody Parker (Environmental Science, U of ID, 2012–2013); Travis Reeves (Environmental Science, U of ID, 2011); Alison Kennedy (Montana State Univ., 2007); Andrew Whitmore (Montana State Univ., 2006–2007); Jason Smith (U of WA, 2000–2001).

UNIVERSITY SERVICE

University of Montana

2026 Member, University of Montana AI Working Group

2021 Member, W.A. Franke College of Forestry and Conservation Strategic Planning Committee

2020–2021 Member, W.A. Franke College of Forestry and Conservation Graduate Affairs Committee

2017–2021 Director, Systems Ecology Intercollegiate Graduate Program (MS, PhD), University of Montana

2015–2018 Member, W.A. Franke College of Forestry and Conservation, Space Committee

2015–2016 Member, University Ecology Programs and Organization Review Committee

University of Idaho

2014–2015 Member, College of Natural Resources, College Curriculum Committee

2014–2015 Member, College of Natural Resources, Lab Space Committee

2013–2014 Member, College of Natural Resources, Tenure and Promotion Criteria Review Committee

2013–2015 Member, Department of Forest, Rangeland, and Fire Sciences, Graduate Program Committee

2013–2014 Member, Department of Forest, Rangeland, and Fire Sciences, Forest Biologist Search Committee

2013–2014 Member, Department of Forest, Rangeland, and Fire Sciences, Tenure and Promotion Review Committee

2011–2012 Member, Department of Forest, Rangeland, and Fire Sciences, Department Head Search Committee

PROFESSIONAL AND PUBLIC SERVICE

2024 Hosted a two-day COMPASS Science Communication workshop for research and graduate students in the Missoula community, as part of an NSF grant

2024 Member, NSF proposal review panel (virtual)

2021– Registered expert on wildfire science with AAAS' SciLine program (connecting journalists with current evidence)

2020 Member, NSF proposal review panel (virtual)

2017–2018 Deevey Award Coordinator, Paleoecology Section, Ecological Society of America

2017 Member, NSF proposal review panel (× 2)

2015 Member, NSF proposal review panel

2013–2014 Chair, Paleoecology Section of the Ecological Society of America

2012–2013 Vice Chair, Paleoecology Section of the Ecological Society of America

2007– ***CharAnalysis***: developed and maintain an open-source program for analyzing sediment-charcoal records. Since its original development, *CharAnalysis* has been used in dozens of published studies to analyze sediment-charcoal records on six continents. Companion tools *MCAgeDepth* and *CRSModel* support chronology development for sediment records.

2006–2009 Secretary, Paleoecology Section of the Ecological Society of America

2006–2012 Instructor, North Cascades Institute, Diablo, WA; designed and co-taught two-day adult-education courses on forest and fire ecology each summer

2005, 2010 Co-organized and led workshops (20–30 participants) on reconstructing fire regimes from sediment-charcoal records, Ecological Society of America annual meetings

Peer review

Journals (since 2007, average 8/yr): *Annals of the Association of American Geographers, Biology Letters, Canadian Journal of Forest Research, Climatic Change, Earth's Future, Ecology, Ecology Letters,*

Ecological Monographs, Ecosphere, Ecosystems, Fire, Fire Ecology, Forest Ecology and Management, Frontiers in Ecology and the Environment, Global Change Biology, International Journal of Wildland Fire, Island Press, Journal of Applied Ecology, Journal of Biogeography, Journal of Ecology, Journal of Paleolimnology, Journal of Quaternary Science, Journal of Vegetation Science, Mires and Peat, National Academy of Sciences, Nature, Nature Communications, New Phytologist, Palaeogeography Palaeoclimatology Palaeoecology, PLoS ONE, Philosophical Transactions of the Royal Society B, Polar Science, PNAS, The Holocene, Quaternary International, Quaternary Research, Quaternary Science Reviews.

Funding agencies (since 2007, average 3/yr, in addition to NSF panels): *U.S. National Science Foundation, NASA, Joint Fire Science Program, Swiss National Science Foundation, ANR (France), NSERC (Canada), Netherlands Polar Programme.*

PROFESSIONAL DEVELOPMENT

2019 "Elevating Wildfire Conversations in Montana: A COMPASS Workshop, Flight, & Field Trip." One-day science-communication workshop.

2018 "Sparking a dialogue on wildfire: A COMPASS communication workshop," Missoula Montana. One-day science-communication workshop.

2018 "Summer Institute on Scientific Teaching," Univ. of Montana. A 3-day workshop focused on evidence-based, inclusive teaching methods, sponsored by Yale Poorvu Center for Teaching & Learning and the Howard Hughes Medical Institute.

2015 "Selling your story: presentation skill building series," University of Montana, Faculty Development Program. Five-class program on presentation skills for faculty.

2014 "Bayesian Modeling for Practicing Ecologists" One of 22 professionals selected to participate in this nine-day NSF-funded workshop at Colorado State University.

2011 "Stable Isotopes in the Paleoenvrionment" Student in five-day NSF-funded short course at Kansas State University.

2011 COMPASS one-day workshop for science communication, participant.

PROFESSIONAL ASSOCIATIONS

2012– Association for Fire Ecology

2006– International Paleofire Working Group

2006– American Geophysical Union

2000– Ecological Society of America (Paleoecology Section member)