

DON MCKENZIE

RESEARCH LANDSCAPE ECOLOGIST

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EDUCATION

University of Washington, College of Forest Resources, Seattle, WA

Ph.D., Landscape Ecology, June 1998

M.S., Forest Biometrics, December 1994

University of California at Berkeley, Berkeley, CA

B.A., Anthropology and Psychology, June 1974

RESEARCH INTERESTS

Climatic change and its effects on disturbance regimes, species responses, and air quality in protected areas; paleological fire studies, controls on fire regimes, and scaling relationships; forest biogeography and climatic variability; fire severity and spatial patterns of fuels.

PROFESSIONAL EXPERIENCE

Research Landscape Ecologist, US Forest Service, 2002-

Research Scientist, University of Washington, 1998-2002

CURRENT UNIVERSITY AFFILIATION

University of Washington

School of Environmental and Forest Sciences: Affiliate professor

JISAO-CSES Climate Impacts Group: Principal investigator for forest ecosystems

PUBLICATIONS IN REVIEW OR PREPARATION

McKenzie, D., and M.C. Kennedy. (in revision). Power laws reveals phase transitions in landscape controls of fire regimes. *Nature Communications*.

Raymond, C.L., and **D. McKenzie**. (in revision). Carbon dynamics of forests in Washington, U.S: projections for the 21st century based on climate-driven changes in fire regime. *Ecological Applications*.

Raymond, C.L., **D. McKenzie**, and R.B. Gwozdz. (in revision). A comparison of algorithms for estimating foliar biomass of conifers in the Pacific Northwest, U.S. *Canadian Journal of Forest Research*.

McKenzie, D., and J.S. Littell. (in preparation). Climate change and the eco-hydrology of fire: why our area-burned predictions are wrong. *Ecology Letters*.

McKenzie, D., M.C. Kennedy, D.A. Falk, C. Miller, P.F. Hessburg, M.A. Moritz, and N.A. Povak. (in preparation). Landscape fire and ecosystem energetics. *Trends in Ecology and Evolution*.

Cansler, C.A., and **D. McKenzie**. (in preparation). Fire size and ecological setting influence severity and spatial pattern of severity of fires in the Cascade Range, Washington, USA. *Ecological Applications*.

PUBLICATIONS IN PRESS

Cansler, C.A., and **D. McKenzie**. (in press). Evaluation of remotely sensed and field-based burn severity metrics using fires in the Cascade Range, Washington, USA. *Remote Sensing*.

PUBLICATIONS

McKenzie, D., N.H.F. French, and R.D. Ottmar. 2012. National database for calculating fuel available to wildfires. *EOS Transactions* 93:57-58.

McKenzie, D., C. Miller, and D.A. Falk, eds. 2011. *The Landscape Ecology of Fire*. Dordrecht, The Netherlands, Springer Ltd.

McKenzie, D., C. Miller, and D.A. Falk. 2011. Toward a theory of landscape fire. Chapter 1 in **McKenzie, D.**, C. Miller, and D.A. Falk, eds. 2011. *The Landscape Ecology of Fire*. Dordrecht, The Netherlands, Springer Ltd.

McKenzie, D., and M.C. Kennedy. 2011. Scaling laws and complexity in fire regimes. Chapter 2 in **McKenzie, D.**, C. Miller, and D.A. Falk, eds. 2011. *The Landscape Ecology of Fire*. Dordrecht, The Netherlands, Springer Ltd.

McKenzie, D., C. Miller, and D.A. Falk. 2011. Synthesis: landscape ecology and changing fire regimes. Chapter 12 in **McKenzie, D.**, C. Miller, and D.A. Falk, eds. 2011. *The Landscape Ecology of Fire*. Dordrecht, The Netherlands, Springer Ltd.

McKenzie, D., and J.S. Littell. 2011. Climate change and wilderness fire regimes. *International Journal of Wilderness* 22-27,31.

Littell, J.S., **D. McKenzie**, B.K. Kerns, S.A. Cushman, and C.B. Shaw. 2011. Managing uncertainty in climate-driven ecological models to inform adaptation to climate change. *Ecosphere* 2(9):102. doi:10.1890/ES11-00114.1.

Falk, D.A., E.K. Heyerdahl, P.M. Brown, C. Farris, P.Z. Fulé, **D. McKenzie**, T.W. Swetnam, A.H. Taylor, and M.L. van Horne. 2011. Multiscale controls of historical forest fire regimes: new insights from fire-scar networks. *Frontiers in Ecology and the Environment* 9:446-454.

Peterson, D.L., C.D. Allen, J.S. Baron, D.B. Fagre, **D. McKenzie**, N.L. Stephenson, A.G. Fountain, J.A. Hicke, G.P. Malanson, D.S. Ojima, C.L. Tague, and P.J. van Mantgem. 2011. Response of Western mountain ecosystems to climatic variability and change: a collaborative research approach. In J. Bellant and E. Beever (eds.), *Ecological Consequences of Climate Change: Mechanisms, Conservation, and Management*. Taylor and Francis, New York, NY.

French, N.H.F., William J. de Groot, L.K. Jenkins, B.M. Rogers, E. Alvarado, B. Amiro, B. de Jong, S. Goetz, E. Hoy, E. Hyer, R.E. Keane, **D. McKenzie**, Steven G. McNulty, B.E. Law, R.D. Ottmar, D.R. Pérez-Salicrup, J. Randerson, K.M. Robertson, and M. Turetsky. 2011. Model comparisons for estimating carbon emissions from North American wildland fire. *Journal of Geophysical Research* 116, G00K05, doi:10.1029/2010JG001469.

McKenzie, D. 2010. The effects of climatic change and wildland fires on air quality in national parks and wilderness areas. *Fire Management Today* 70:26-28.

Kennedy, M.C., and **D. McKenzie**. 2010. Using a stochastic model and cross-scale analysis to evaluate controls on historical low-severity fire regimes. *Landscape Ecology* 25:1561-1573.

Littell, J.S., E.A. Oneil, **D. McKenzie**, J.A. Hicke, J.A. Lutz, R.A. Norheim, and M.M. Elsner. 2010. Forest ecosystems, disturbance, and climatic change in Washington State, USA. *Climatic Change* 102:129-158.

- McKenzie, D.**, D.L. Peterson, and J.S. Littell. 2009. Global warming and stress complexes in forests of western North America. In S.V. Krupa (ed.), *Developments in Environmental Science*, Vol. 8, Wild Land Fires and Air Pollution, A. Bytnerowicz, M. Arbaugh, A. Riebau, and C. Anderson (eds.). Amsterdam, The Netherlands: Elsevier Science, Ltd. pp. 319-337.
- Kopper, K.E., **D. McKenzie**, and D.L. Peterson. 2009. The evaluation of meta-analysis techniques for quantifying prescribed fire effects on fuel loadings. USDA Forest Service Research Paper PNW-RP-582. Pacific Northwest Research Station, Portland, OR.
- Littell, J.S., **D. McKenzie**, D.L. Peterson, and A.L. Westerling. 2009. Climate and wildfire area burned in western U.S. ecoregions, 1916-2003. *Ecological Applications* 19:1003-1021.
- Baron, J.S., L. Gunderson, C.D. Allen, E. Fleishman, **D. McKenzie**, L.A. Meyerson, J. Oropeza, and N. Stephenson. 2009. Options for national parks and reserves for adapting to climate change. *Environmental Management* DOI 10.1007/s00267-009-9296-6.
- Chen, J., J. Avise, B. Lamb, E.P. Salathé, C.F. Mass, A. Guenther, C. Wiedinmyer, J-F. Lamarque, S.M. O'Neill, **D. McKenzie**, and N. Larkin. 2009. The effects of global changes upon regional ozone pollution in the United States. *Atmospheric Chemistry and Physics* 9:1125-1141.
- Littell, J.S., E.E. Oneil, **D. McKenzie**, J.A. Hicke, J.A. Lutz, R.A. Norheim, and M. McGuire Elsner. 2009. Forest ecosystems, disturbance, and climatic change in Washington State, USA. Chapter 7 in *The Washington Climate Change Impacts Assessment: Evaluating Washington's Future in a Changing Climate*, Climate Impacts Group, University of Washington, Seattle, Washington.
- McKenzie, D.**, and J.S. Littell. 2009. Climate change, fire, insects, and disturbance interactions: adaptation challenges in the West. *Mountain Views* 3:3-6.
- McKenzie, D.**, C.L. Raymond, and S.C. Cushman. 2008. Modeling understory vegetation and its response to fire. Chapter 15, pp.391-414, in J. Millsbaugh and F.R. Thompson III (eds.), *Models for Planning Wildlife Conservation in Large Landscapes*. Burlington, MA: Academic Press.
- Kellogg, L.-K.B., **D. McKenzie**, D.L. Peterson, and A.E. Hessler. 2008. Spatial models for inferring topographic controls on low-severity fire in the eastern Cascade Range of Washington, USA. *Landscape Ecology* 23:227-240.
- Heyerdahl, E.K., **D. McKenzie**, L.D. Daniels, A.E. Hessler, J.S. Littell, and N.J. Mantua. 2008. Climate drivers of regionally synchronous fires in the inland Northwest (1651–1900). *International Journal of Wildland Fire* 17:40-49.
- McKenzie, D.**, and A.E. Hessler. 2008. A neutral model for low-severity fire regimes. Pages 139-149 in M. Narog, compiler, *Proceedings of the 2002 Fire Conference: Managing Fire and Fuels in the Remaining Wildlands and Open Spaces of the Southwestern United States*, December 2–5, 2002, San Diego, California.
- McKenzie, D.**, C.L. Raymond, L.-K.B. Kellogg, R.A. Norheim, A.G. Andreu, A.C. Bayard, K.E. Kopper, and E. Elman. 2007. Mapping fuels at multiple scales: landscape application of the Fuel Characteristic Classification System. *Canadian Journal of Forest Research* 37:2421-2437.
- Falk, D.A., C. Miller, **D. McKenzie**, and A.E. Black. 2007. Cross-scale analysis of fire regimes. *Ecosystems* 10:809-823.

- Cushman, S.A., **D. McKenzie**, D. L. Peterson, J.S. Littell, and K.S. McKelvey. 2007. Research agenda for integrated landscape modeling. USDA Forest Service General Technical Report RMRS-GTR-194. Rocky Mountain Research Station, Fort Collins, CO.
- McKenzie, D.**, and C.D. Allen. 2007. Climate change and disturbance regimes in western North America. *EOS Transactions* 88(21):227.
- McKenzie, D.**, S.M. O'Neill, N. Larkin, and R.A. Norheim. 2006. Integrating models to predict regional haze from wildland fire. *Ecological Modelling* 199:278-288.
- McKenzie, D.**, A.E. Hessler, and L.-K.B. Kellogg. 2006. Using neutral models to identify constraints on low-severity fire regimes. *Landscape Ecology* 21:139-152.
- McKenzie, D.**, S.M. O'Neill, N. Larkin, and R.A. Norheim. 2006. How will climatic change affect air quality in parks and wilderness? In: D. Harmon, ed. Proceedings of the 2005 George Wright Society Annual Meeting, Philadelphia, PA.
- Wiedinmyer, C., B. Quayle, C. Geron, A. Belote, **D. McKenzie**, X. Zhang, S.M. O'Neill, and K.K. Wynne. 2006. Estimating emissions from fires in North America for air quality modeling. *Atmospheric Environment* 40:3419-3432.
- Hessler, A.E., J. Miller, J. Kernan, and **D. McKenzie**. 2006. Mapping wildfire boundaries from binary point data: comparing approaches. *Professional Geographer* 59:87-104.
- Raymond, C.L., L.-K.B. Kellogg and **D. McKenzie**. 2006. Mapping fuels on the Okanogan and Wenatchee National Forests. Pages 293-304 in P.L. Andrews and B.W. Butler (editors). Fuels management - how to measure success: conference proceedings. March 28-30, 2006, Portland, OR. Proceedings RMRS-P-41. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station.
- Halpern, C.B., **D. McKenzie**, S.A. Evans, and D.A. Maguire. 2005. Early responses of forest understories to varying levels and patterns of green-tree retention. *Ecological Applications* 15:175-195.
- McKenzie, D.**, Z.M. Gedalof, D.L. Peterson, and P. Mote. 2004. Climatic change, wildfire, and conservation. *Conservation Biology* 18:890-902.
- McKenzie, D.** 2004. La historia del fuego y su relación con el clima. Pages 13-28 in: L. Villers-Ruiz and J López-Blanco, eds. *Incendios forestales en México: métodos de evaluación*. Universidad Nacional Autónoma de México, México, DF.
- McKenzie, D.**, S. Prichard, A.E. Hessler, and D.L. Peterson. 2004. Empirical approaches to modelling wildland fire in the Pacific Northwest: methods and applications to landscape simulations. Chapter 7 in A.J. Perera, L. Buse, and M.G. Weber, eds., *Emulating Natural Forest Landscape Disturbances*. Columbia University Press, New York, NY.
- Peterson, D.L., M.C. Johnson, J.K. Agee, T.B. Jain, **D. McKenzie**, and E.D. Reinhardt. 2005. Forest structure and fire hazard in dry forests of the western United States. USDA Forest Service General Technical Report PNW-GTR-628. Pacific Northwest Research Station, Portland, OR.
- Hessler, A.E., **D. McKenzie**, and R. Schellhaas. 2004. Drought and Pacific Decadal Oscillation linked to fire occurrence in the inland Pacific Northwest. *Ecological Applications* 14:425-442.
- McKenzie, D.**, D.W. Peterson, D.L. Peterson, and P.E. Thornton. 2003. Climatic and biophysical controls on conifer species distributions in mountain forests of Washington State, USA. *Journal of Biogeography* 30:1093-1108.

McKenzie, D., D.W. Peterson, and D.L Peterson. 2003. Modelling conifer species distributions in mountain forests of the Pacific Northwest. *Forestry Chronicle* 79:253-258.

McKenzie, D., A. Hessel, and D.L. Peterson. 2001. Recent growth in conifer species of western North America: assessing the spatial patterns of radial growth trends. *Canadian Journal of Forest Research* 31:526-538.

Halpern, C.B., and **D. McKenzie.** 2001. Disturbance and post-harvest ground conditions in a structural retention experiment. *Forest Ecology and Management* 154:215-225.

McKenzie, D., D.L. Peterson, and J.K. Agee. 2000. Fire frequency in the Columbia River Basin: building regional models from fire history data. *Ecological Applications* 10:1497-1516.

McKenzie, D., C.B. Halpern, and C.R. Nelson. 2000. Overstory influences on herb and shrub communities in mature forests of western Washington, USA. *Canadian Journal of Forest Research* 30:1655-1666.

Peterson, D.L., S.J. Prichard, and **D. McKenzie.** 2000. Disturbance in Mountain Forests. In Price, M., ed. *Forests in Sustainable Mountain Development: a State-of-Knowledge Report for 2000.* CAB International, Oxford, England. Pages 51-59.

Schmoltdt, D.L., D.L. Peterson, R.E. Keane, J.M. Lenihan, **D. McKenzie,** D.R. Weise, and D.V. Sandberg. 1999. Assessing the effects of fire disturbance on ecosystems: a scientific agenda for research and management. USDA Forest Service General Technical Report PNW-GTR-455.

McKenzie, D. and C.B. Halpern. 1999. Modeling understory shrub distributions in Pacific Northwest forests. *Forest Ecology and Management* 114:293-308.

Halpern, C.B., S.A. Evans, C.R. Nelson, **D. McKenzie,** D.A. Liguori, D.E. Hibbs, and M.G. Halaj. 1999. Response of forest vegetation to varying levels and patterns of green-tree retention: an overview of a long-term experiment. *Northwest Science* 73:27-44.

McKenzie, D. 1998. Fire, vegetation, and scale: toward optimal models for the Pacific Northwest. *Northwest Science* 72:49-65.

McKenzie, D., D.L. Peterson and E. Alvarado. 1996. Predicting the effect of fire on large-scale vegetation patterns in North America. USDA Forest Service Research Paper PNW-489, Pacific Northwest Research Station, Portland, Oregon.

McKenzie, D., D.L. Peterson and E. Alvarado. 1996. Extrapolation problems in modeling fire effects at large spatial scales: a review. *International Journal of Wildland Fire* 6:65-76.

Maguire, D.A., J.L.F. Batista and **D. McKenzie.** 1993. Horizontal structure of uneven-aged mixed-species forests modeled as an inhomogeneous Poisson process. Proceedings of the IUFRO conference on Spatial Stochastic Processes in Forestry.

PROFESSIONAL MEMBERSHIPS

International Association for Landscape Ecology

Ecological Society of America

Society for Conservation Biology

American Geophysical Union

American Association for the Advancement of Science