

Dr. Seth W. Bigelow, Ph.D.

Curriculum Vitae

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Professional Experience

Assistant Scientist, Forest Ecologist, Joseph W. Jones Ecological Research Center, Newton, Georgia. October 2015--present

Independent forest ecology researcher, 2013-2015

- Initiated research on northern hardwood tree response to climate change
- Published findings from previous research in top science journals
- Mentored 4 interns in independent ecological research projects as Huyck Senior Research Fellow

Principal vegetation researcher for study of a community-led initiative for forest restoration, fire hazard reduction, and economic stability in Sierra Nevada mixed-conifer forest (U.S. Forest Service, Davis California: 2002-2012, GS11/12)

- Collaborated with forest managers and community members to research forest management impacts on fire climate & restoration of stand structure and resilience
- Managed budgets and personnel for research group

Post-doctoral researcher on study of northern hardwood tree response to human-induced alteration in soil calcium (Cary Institute of Ecosystem Studies, Millbrook NY: 1998-2002)

- Planned, carried out, and published long-term forest fertilization studies
- Used likelihood statistics & forest simulation modeling

Graduate researcher for study of tree biodiversity vs. stand longevity effects on leaching of nutrients from tropical soils under intense rainfall (University of Florida: 1989-1998)

- Conducted soil chemical analyses and water-balance modeling
- Managed seven-person field crew

Education

Ph. D. (1998), M. S. (1992), Botany & Ecology, University of Florida, Gainesville

B.A. (1988), Biology, University of California, Santa Cruz (college honors, Phi Beta Kappa)

Publications

- Bigelow, S. W.,** N. A. Jansen, S. B. Jack, and C. L. Staudhammer. Influence of selection method on skidder-trail soil compaction in longleaf pine forest. *Forest Science*. doi: 10.1093/forsci/fxy023. *In Press*.
- Whelan, A. W., **S. W. Bigelow**, M. F. Nieminen, and S. B. Jack. 2018. Fire season, overstory density and groundcover composition affect understory hardwood sprout demography in longleaf pine woodlands. *Forests* 2018, 9(7), 423; doi: 10.3390/f9070423.
- Bigelow, S.,** and C. Canham. 2017. Neighborhood-scale analyses of non-additive species effects on cation concentrations in forest soils. *Ecosystems* 20:1351-1363.
- Bigelow, S. W.,** C. D. Canham. 2015. Litterfall as a niche construction process in a northern hardwood forest. *Ecosphere* 6(7): Art117.
- Stephens, S. L., **S. W. Bigelow**, R. D. Burnett, B. M. Collins, C. V. Gallagher, J. Keane, D. A. Kelt, M. P. North, L. J. Roberts, P. Stine, D. H. Van Vuren. 2014. California spotted owl, songbird, and small mammal responses to landscape-level fuel treatments. *BioScience* 64 (10):893-906.
- Bigelow, S. W.,** Caum, C., M. North, and M. Papaik, M. 2014. Faster growth in warmer winters for large trees in a Mediterranean-climate ecosystem. *Climatic Change* 12 3(2): 215-224.
- Kelt, D. A., D. H. Van Vuren, M. L. Johnson, J. A. Wilson, R. J. Innes, B. R. Jesmer, K. P. Ingram, J. R. Smith, **S. W. Bigelow**, R. D. Burnett, P. A. Stine. 2013. Small mammals exhibit limited spatio-temporal structure in Sierra Nevada forests. *Journal of Mammalogy* 94 (6): 1197-1213.
- Bigelow, S. W.,** and M. P. North. 2012. Microclimate effects of fuels-reduction and group-selection silviculture: implications for fire behavior in Sierran mixed-conifer forests. *Forest Ecology and Management* 264: 51-59.
- Ewel, J. J., and **S. W. Bigelow**. 2011. Tree species identity and interactions with neighbors determine nutrient leaching in model tropical forests. *Oecologia* 167: 1127-1140.
- Bigelow, S. W.,** M. P. North, and C. F. Salk. 2011. Using light to predict fuels-reduction and group-selection effects on succession in Sierran mixed-conifer forest. *Canadian Journal of Forest Research* 41(10): 2051-2063.
- Bigelow, S. W.,** and C. D. Canham. 2010. Evidence that soil aluminum enforces site fidelity of southern New England forest trees. *Rhodora* 112(949): 1-21.
- Bigelow, S. W.,** and S. A. Parks. 2010. Predicting altered connectivity of patchy forests under group selection silviculture. *Landscape Ecology* 25(3): 435-447.
- Bigelow, S. W.,** M. P. North, and W. R. Horwath. 2009. Models of resource-dependent growth for Sierran mixed-conifer saplings. *The Open Forest Science Journal* 2: 31-40.
- Bigelow, S. W.,** and C. D. Canham. 2007. Nutrient limitation of juvenile trees in a northern hardwood forest: calcium and nitrate are preeminent. *Forest Ecology and Management* 243: 310-319.
- Diaz M. F., **Bigelow, S. W.,** and Armesto, J. J. 2007. Alteration of the hydrologic cycle due to forest clearing and its consequences for rainforest succession. *Forest Ecology and Management* 244: 32-40.

- Coppeto, S. A., D. Van Vuren, D. A. Kelt, **S. Bigelow**, and J. Wilson. 2006. Habitat associations of small mammals at two spatial scales in the northern Sierra Nevada, California. *Journal of Mammalogy* 87: 402-413.
- Bigelow, S. W.**, J. J. Ewel, and J. P. Hagggar. 2004. Enhancing nutrient retention in tropical tree plantations: no short cuts. *Ecological Applications* 14: 28-46.
- Strayer, D. L, H. A. Ewing, and **S. W. Bigelow**. 2003. What kinds of spatial and temporal detail are required in models of heterogeneous systems? *Oikos* 102: 654-662.
- Bigelow, S. W.**, and C. D. Canham. 2002. Community organization of tree species along soil nutrient gradients in a northeastern USA forest. *Journal of Ecology* 90:188-200.
- Bigelow, S. W.** 2001. Evapotranspiration modeled from stands of three broad-leaved tropical trees in Costa Rica. *Hydrological Processes* 15(14): 2779-2796.
- Bigelow, S. W.** 1993. Leaf nutrients in relation to stature and life form in tropical rain forest. *Journal of Vegetation Science* 4:401-408.

Book Chapters

- Bigelow, S. W.**, R. H. Yahner, C. G. Mahan, A. D Rodewalk, L. M. Conner, and L. L. Smith. Forest management for wildlife. In N. Silvy (editor). *Wildlife Techniques Manual*. The Wildlife Society, Bethesda, Maryland, USA. (*In Press*)
- Bigelow, S.**, M. C. Stambaugh, J. J. O'Brien, A. J. Larson, and M. A. Battaglia. 2017. Longleaf pine restoration in context: comparisons of frequent-fire forests. Pages 311-338 in L. K. Kirkman and S. B. Jack (editors). *Ecological Restoration and Management of Longleaf Pine Forests*. CRC Press, Boca Raton, Florida.
- Harris, G. P., **S. W. Bigelow**, J. J. Cole, H. Cyr, L. L. Janus, A. P. Kinzig, J. F. Kitchell, G. E. Likens, K. H. Reckhow, D. Scavia, D. Soto, L. M. Talbot, and P. H. Templer. 2003. The role of models in ecosystem management. In C. D. Canham, J. J. Cole, and W. K. Lauenroth (editors). *The Role of Models in Ecosystem Science*. Princeton University Press, Princeton, New Jersey.
- Bigelow, S. W.**, and P. Kukle. 2000. Ferns. Pp 89 in N. Nadkarni and N. Wheelwright (editors). *Monteverde: Ecology and Conservation of a Tropical Cloud Forest*. Oxford University Press.
- Ewel, J. J., and **S. W. Bigelow**. 1996. Plant life forms and tropical ecosystem functioning. Chapter 6, Pages 101-126 in G. H. Orians, R. Dirzo, and J. H. Cushman (editors). *Biodiversity and Ecosystem Processes in Tropical Forests*. Ecological Studies Vol. 122. Springer Verlag, Berlin.

Reports, Letters, Educational Materials

- Bigelow, S. W.**, C. Dillingham, and L. J. Payne. 2012. Fuels reduction and group selection in Sierran Mixed-Conifer forest: Effects on stand structure, understory plants, and simulated fire behavior. Report to US Forest Service Herger-Feinstein Quincy Library Group monitoring program & The Pinchot Institute. 51 pp.
- Bigelow, S. W.**, C. Dillingham, and L. J. Payne. 2012. Fuels reduction and group selection in Sierran Mixed-Conifer forest: Monitoring short-term effects on environmental attributes. Report to US Forest Service Herger-Feinstein Quincy Library Group monitoring program & The Pinchot Institute. 64 pp.

- Bigelow, S. W.**, and M. P. North. 2011. Final Report: Vegetation Module, Plumas Lassen Administrative Study. US Forest Service, Pacific Southwest Research Station.
- Bigelow, S. W.**, and P. N. Manley. Vegetation response to fuels management in the Lake Tahoe Basin. *In* J. W. Long and P. A. Stine, eds. Effects of Fuels Management in the Tahoe Basin: A scientific literature review. Report prepared by the US Department of Agriculture, Forest Service, Pacific Southwest Research Station, and the Tahoe Science Consortium. Pp. 32-74.
- Manley, P. N., D. D. Murphy, **S. W. Bigelow**, S. Chandra, and L. Crampton. 2010. Ecology and Biodiversity. *In* Z. Hymanson and M. Collopy, editors. An Integrated Science Plan for the Lake Tahoe Basin: Conceptual Framework and Research Strategies. Gen. Tech. Rep. PSW-GTR-226. Albany, California: U.S. Department of Agriculture, Forest Service, Pacific Southwest Research Station: 237–301.
- Bigelow, S. W.**, H. Itagaki, and E. R. Heithaus. 2002. On running a faculty search. Bulletin of the Ecological Society of America, October 2002.
- Bigelow, S. W.** 1993. Mineral nutrients in our waters: ecological experiments for students and teachers in north-central Florida. Published by the author.
- Bigelow, S. W.**, and P. Kukle. 1992. A guide to the ferns of Monteverde, Costa Rica. Tropical Science Center, San José, Costa Rica.

Current Jones Center Research

- Bigelow, S. W., L. M. Conner, S. B. Jack, R. K. McIntyre, and L. L. Smith. Ecological forestry in the longleaf pine forest type-management to sustain and restore the ecosystem and reconnect the landscape.
- Bigelow, S. W., S. B. Jack, S. T. Brantley, L. M. Conner, K. Klepzig, and L. Nagel. Adaptive silviculture for climate change in southeastern USA.
- Bigelow, S. W. Neighborhood approaches to fire behavior and plant diversity feedbacks in longleaf pine woodland.

Funding History

- \$12,000. The Huyck Foundation Senior Researcher Grant. Climate and competition effects on growth in a hemlock-hardwood stand in eastern New York state, USA.
- \$192,000 to Seth Bigelow, Michael Papaik, and Malcolm North (2009). Source: US Forest Service, Storrie Fire Mitigation Fund (2009). Project: Spatial analysis of climate impacts and seedling dispersion in Sierran mixed conifer forest.
- \$26,960 to Charles Canham and Seth Bigelow (2001). Source: Mellon Foundation grant to Cary Institute of Ecosystem Studies. Project: Resource Heterogeneity in Mosaic Landscapes: A Spatially Explicit Model of Biotic and Abiotic Controls of Calcium Availability in Forest Soils.

Presentations

- University of Florida School of Forest Resources and Conservation. 2017. Seminar: Oaks and Openings: Feedbacks to Fire in the Longleaf Pine Forest.
- Friends of Apalachicola National Forest. 2016. Evening presentation: Oaks, Openings, and Fire in the Longleaf Pine Forest.
- Huyck Preserve Research 32nd Annual Science Symposium, Rensselaerville, NY. 2014. Invited presentation: Tree growth response to climate variation and neighborhood density.
- Huyck Preserve Summer Science Lecture Series, June 2014. Invited lecture: Using tree rings and tree neighborhoods to understand growth in a changing climate.
- North American Forest Ecology Workshop, Bloomington IN. 2013. Oral presentation: Dry conifer forest health indicators after fuels reduction and group selection treatments.
- University of Florida Department of Forest Resources and Conservation, Gainesville FL. 2011. Seminar: Restoration in a working mixed-conifer forest: Predictions from resource-dependent models.
- University of California Wildfire Conference, McClellan, California. 2011. Poster 1: Higher winds, drier duff when canopy is opened by thinning or group selection. Poster 2: Ecology and management implications of seedling dispersal after forest fire and harvest disturbances.
- Plumas-Lassen Annual Symposium, Quincy, California. 2011. Oral presentation: the Vegetation Module.
- Ecological Society of America Annual Meeting, Pittsburgh PA. 2010. Poster: Spatial analysis of mixed-conifer seedling dispersal in contrasting regeneration environments.
- University of California Wildfire Conference, McClellan, California. 2010. Poster: Fuels-reduction thinning effects on soil water and understory light in a mixed conifer forest.
- Plumas-Lassen Annual Symposium, Quincy, California. 2010. Oral presentation: the Vegetation Module.

Teaching Experience

- Fall 2006. Lecturer and lab instructor for Environmental Restoration, Department of Environmental Studies, San Jose State University.
- 1989-1998. Supervision of undergraduate laboratory courses in ecology (3 semesters), introductory biology (3 semesters), plant physiology (1 semester) and botany (1 semester). Lab preparation and assistance in a graduate course in plant physiological ecology (1 semester).

Professional Service and Outreach Activities

- Member, Ecological Society of America
Member, Society of American Foresters
Associate Editor: Tropical Ecology, 2014 to present.

Journal Reviews: Fire Ecology, Canadian Journal of Forest Research, Forest Ecology and Management, Annals of Forest Science, Forests, Baltic Forestry, Journal of Environmental Management, Ecology, Ecosystems, Oikos, Journal of Ecology, Journal of Tropical Ecology, Tropical Ecology, Annals of Botany, Plant Ecology, Conservation Biology, Journal of Vegetation Science, Biotropica, Journal of Biogeography, Acta Physiologia Plantarum, Applied Vegetation Science, Journal of Hydrology, Land Degradation and Development, Environmental Pollution, Agriculture Ecosystems and Environment, African Journal of Agricultural Research, Soil Science Society of America Journal.

Volunteering: Landgrove VT conservation commission, 2012-present: with Bennington County Forester, planned town forest harvest and regeneration strategy (with climate adaptation component).

Proficient in conversation, reading, and writing in Spanish and French. Conversant in Portuguese and German.

Recent Student Advisement

Anna Rollosso. Current. Estimating the effect of sympatric hardwoods on the growth and drought resistance of mature longleaf pine. University of Florida, Gainesville, Florida. (Co-advisor with Jan Vogel).