

BRIAN BECKAGE

Curriculum Vitae

CURRENT POSITION

Associate Professor
Department of Plant Biology
University of Vermont
Burlington, VT 05405
802-656-0197 / email: Brian.Beckage@uvm.edu

SPECIALIZATIONS

Computational Ecology; Fire Ecology; Forest Ecology; Statistical Ecology; Theoretical Ecology.

EDUCATION

Duke University, Department of Botany, Durham, NC: 1995-2000

Ph.D., September 2000. Advisor: Dr. James S. Clark

Dissertation: Seedling recruitment in Southern Appalachian forests: Does spatial heterogeneity maintain species diversity?

Duke University, Institute of Statistics and Decision Sciences, Durham, NC: 1998-2000.

M.S., September 2000. Advisor: Dr. Michael Lavine

Thesis: A long-term study of red maple (*Acer rubrum* L.) seedling survival in Southern Appalachian forests: the effects of canopy gaps and shrub understories.

University of Central Florida, Department of Biology, Orlando, FL: 1992-1995.

M.S., August 1995. Advisor: Dr. I. Jack Stout

Thesis: The effects of repeated burning on the distribution and abundance of flowering plants in central Florida sandhills.

Cornell University, Department of Civil and Environmental Engineering, Ithaca, NY: 1985-1989. B.S., May 1989

Eau Gallie High School, Melbourne, FL. Graduated Salutatorian, 1985.

PROFESSIONAL EXPERIENCE

Associate Professor, University of Vermont, Department of Biology, Burlington, VT. Sep 2009-Present.

Sabbatical Fellow, National Institute for Mathematical and Biological Synthesis, Knoxville, TN. Jan 2010 – July 2010.

Assistant Professor, University of Vermont, Department of Plant Biology, Burlington, VT. Sep 2003-Sep 2009.

Postdoctoral Research Associate, University of Tennessee, Department of Ecology and Evolutionary Biology, Knoxville, TN. Nov 2001-Dec 2003. Advisor: Dr. Louis Gross

Postdoctoral Research Associate, Louisiana State University, Department of Biological Sciences, Baton Rouge, LA. Jun 2000-Nov 2001. Advisor: Dr. William Platt

PUBLICATIONS (* *indicates non peer reviewed report*)

In Review or Revision

Beckage, B., L. Gross, W. Platt, W. Godsoe, and D. Simberloff. Individual variation, niches, and weak neutrality. In revision.

Eppinga, M. B., C. A. Pucko, B. Beckage and J. Molofsky. A new approach to infer vegetation boundary dynamics from ‘snapshot’ data. In revision.

Pucko, C., B. **Beckage**, T. Perkins, and W. Keeton. Species shifts in response to climate change: Individual or shared responses? In review.

Beckage, B., L. Gross, and W. Platt. Grass feedbacks on fire stabilize savannas. In review.

Beckage, B., W. Platt, L. Gross, and M. Slocum. A conceptual model of climate-fire-vegetation dynamics. In revision.

McCloskey, J., C. Loftin, and B. **Beckage**. The role of fuel accumulation and climatic conditions on the fire regime of the Okefenokee swamp. In revision.

Tang, G., B. **Beckage**, and B. Smith. Modeling the transient dynamics of forests in New England under historical and future projected climate change. In review.

Beckage, B., and L. Gross. Chaos and computational irreducibility: The limits to prediction in ecological systems. In revision.

Published or In Press

Tang, G., B. **Beckage**, B. Smith, and P. Miller. Estimating potential forest NPP, biomass and their climatic sensitivity in New England using a dynamic ecosystem model. *Ecosphere*. In press.

Slocum, M., W. J. Platt, B. **Beckage**, S. L. Orzell, and W. Taylor. Accurate quantification of seasonal rainfall improves understanding of climate-wildfire relationships. *Journal of Applied Meteorology and Climatology*. In press.

Slocum, M., B. **Beckage**, W. Platt, S. Orzell, and W. Taylor. 2010. Effect of climate on wildfire size: A cross-scale analysis. *Ecosystems* 13: 828-840.

Tang, G., and B. **Beckage**. 2010. Projecting the distribution of forests in New England in response to climate change. *Diversity and Distributions* 16: 144-158.

- Stevens, J., and B. **Beckage**. 2010. Fire effects on demography of the invasive shrub Brazilian pepper (*Schinus terebinthifolius*) in Florida pine savannas. *Natural Areas Journal* 30: 53-63.
- Beckage**, B., W. Platt, and L. Gross. 2009. Vegetation, fire and feedbacks: A disturbance-mediated model of savannas. *The American Naturalist* 174(6): 805-818.
- Stevens, J., and B. **Beckage**. 2009. Fire feedbacks facilitate invasion of pine savannas by Brazilian pepper (*Schinus terebinthifolius*). *New Phytologist* 184: 365-375.
- Beckage**, B., and C. Ellingwood. 2008. Fire feedbacks with vegetation and alternative stable states. *Complex Systems* 18: 159-173.
- Gavin, D. G., B. **Beckage**, and B. Osborne. 2008. Forest dynamics and the growth decline of red spruce and sugar maple on Bolton Mountain, Vermont: A comparison of modeling methods. *Canadian Journal of Forest Research* 38(10): 2635-2649.
- Beckage**, B., B. D. Kloeppel, J. A. Yeakley, S. F. Taylor, and D. C. Coleman. 2008. Differential effects of understory and overstory gaps on tree regeneration. *Journal of the Torrey Botanical Society* 135(1): 1-11.
- Beckage**, B., B. Osborne, C. Pucko, D. G. Gavin, T. Siccama, and T. Perkins. 2008. An upward shift of a forest ecotone during 40 years of warming in the Green Mountains of Vermont, USA. *Proceedings of the National Academy of Sciences* 105(11): 4197-4202.
- Beckage**, B., L. Joseph, P. Belisle, D. Wolfson, and B. Platt. 2007. Bayesian change-point analyses in ecology. *New Phytologist* 174: 456-467.
- Slocum, M. G., W. J. Platt, B. **Beckage**, R. Panko, and J. B. Lushine. 2007. Decoupling natural and anthropogenic fire regimes: A case study in Everglades National Park. *Natural Areas Journal* 27: 41-55
- * Battaglia, L. L., and B. **Beckage**. Large-Scale Disturbances and Ecological Communities in the Southeast US. White Paper, Department of Defense, Southeast Region Threatened, Endangered, and At-Risk Species (TER-S) Workshop, March 2007.
- Platt, W. J., J. M. Huffman, M. G. Slocum and B. **Beckage**. 2006. Fire Regimes and Trees in Florida Dry Prairie Landscapes. *Land of Fire and Water: The Florida Dry Prairie Ecosystem*. Proceedings of the Florida Dry Prairie Conference. Reed F. Noss, Editor.
- Beckage**, B., and L. J. Gross. 2006. Overyielding and species diversity: What should we expect? *New Phytologist* 172: 140-148.
- Beckage**, B., L. J. Gross, and W. J. Platt. 2006. Modelling responses of pine savannas to climate change and large-scale disturbance. *Applied Vegetation Science* 9: 75-82.
- Beckage**, B., M. Lavine, and J. S. Clark. 2005. Survival of tree seedlings across space and time: estimates from long-term count data. *Journal of Ecology* 93: 1177-1184.

- Beckage, B., W. J. Platt, and B. Panko.** 2005. A climate-based approach to the restoration of fire dependent ecosystems. *Restoration Ecology* 13: 429-431.
- Beckage, B., and J. S. Clark.** 2005. Does predation contribute to tree diversity? *Oecologia* 143: 458-469.
- Beckage, B., J. Comiskey, and S. Duke-Sylvester.** 2005. Natural fire regimes in southern Florida. *Natural Areas Journal* 25: 6-8.
- Rock, J. H., **B. Beckage,** and L. J. Gross. 2004. Population Recovery following Differential Harvesting of *Allium tricoccum* Ait. in the Southern Appalachians. *Biological Conservation* 16: 227-234.
- Beckage, B., W. J. Platt, M. G. Slocum, and B. Panko.** 2003. Influence of the El Niño-Southern Oscillation on fire regimes in the Florida Everglades. *Ecology* 84: 3124-3130.
- Beckage, B. and J. S. Clark.** 2003. Seedling survival and growth of three southern Appalachian forest tree species: the role of spatial heterogeneity. *Ecology* 84: 1849-1861.
- Beckage, B., and W. J. Platt.** 2003. Predicting severe wildfire years in the Florida Everglades. *Frontiers in Ecology and the Environment* 1: 235-239.
- HilleRisLambers, J., J. S. Clark, and **B. Beckage.** 2002. Density-dependent mortality and the latitudinal gradient in species diversity. *Nature* 417: 732-735.
- Platt, W., **B. Beckage,** B. Doren, and H. Slater. 2002. Interactions of large-scale disturbances: prior fire regimes and hurricane-induced mortality of savanna pines. *Ecology* 83(6): 1566-1572.
- Lavine, M., **B. Beckage,** and J. S. Clark. 2002. Statistical modeling of seedling mortality. *Journal of Agricultural, Biological, and Environmental Statistics* 7: 21-41.
- Clark, J. S., **B. Beckage,** J. HilleRisLambers, I. Ibanez, S. LaDeau, J. MacLachlan, J. Mohan, and M. Rocca. 2001. The role of dispersal in plant migration. In *Encyclopedia of Global Environmental Change, Vol. 3*. H. A. Mooney and J. Canadell, editors.
- Beckage, B., J. S. Clark, B. Clinton, and B. Haines.** 2000. A long-term study of tree seedling recruitment in Southern Appalachian forests: the effects of canopy gaps and shrub understories. *Canadian Journal of Forest Research* 30: 1617-1631.
- Beckage, B. and I. J. Stout.** 2000. The effects of repeated burning on species richness in Florida sandhills: A test of the intermediate disturbance hypothesis. *Journal of Vegetation Science* 11: 113-122.
- Clark, J. S., **B. Beckage,** P. Camill, B. Cleveland, J. HilleRisLambers, J. Lichter, J. MacLachlan, J. Mohan, and P. Wyckoff. 1999. Interpreting recruitment limitation in forests. *American Journal of Botany* 86: 1-16.

- ***Beckage**, B. and W. S. Gain. 1995. Littoral vegetation. *in* "Water budgets, water quality, and analysis of nutrient loading of the winter park chain of lakes, Central Florida 1989-1992". G. G. Phelps and E. R. German. USGS Water Resources Investigations report 95-4108. Tallahassee, FL. 96pp.

GRANTS AND FELLOWSHIPS

- Beckage**, B. (PI). NSF. \$355,000. Linking models to data to investigate patterns and process in savannas. May 2010-May 2013.
- Beckage**, B. National Institute for Mathematical and Biological Synthesis. \$26,900. Using models to investigate patterns, process, and climate change in savannas. Sabbatical fellowship. Jan 2010 to Jul 2010.
- Beckage**, B. (PI). DOE NICCR. \$310,048. Using historical change to predict future distribution of high elevation forests in northern New England. Apr 2008 to Apr 2011.
- Beckage**, B. (PI). Vermont EPSCoR. \$49,894. Investigating the dynamics of savanna communities through computer simulation. Jan 2008 to Jul 2009.
- Beckage**, B. (PD). USDA Hatch. \$60,000. Historical change and functional control of montane forest distribution in northern New England. Oct 2007 to Oct 2010.
- Beckage**, B. (PI). NSF (DEB 0606801). \$50,000. Linking Landscape models of fire, vegetation, and global climate change in the Florida Everglades. Apr 2006 to Apr 2008.
- Platt, W. J., M. Slocum, and B. **Beckage**. (Co-PI). DOD. \$552,247 (\$47,380 to **Beckage**). Landscape fire models for the Avon Park Air Force Range. Sep 2004 to Sep 2009.
- Beckage**, B. (PD). USDA NRI (05-02250). \$100,000. Brazilian pepper, fire and the invasibility of pinelands: exploring nonlinear effects through simulation. Oct 2005 to Oct 2009.
- Beckage**, B. USDA Hatch. (PD). \$60,000. Impact of global climate change on forests in the Green Mountains of Vermont. Oct 2004 to Oct 2007.
- Beckage**, B. (PI). \$100,000. Modeling the effects of hurricane and fire disturbances on the population dynamics of south Florida slash pine. NSF Postdoctoral Research Fellowship in Biological Informatics (DBI 0107553). Jan 2002 to Jan 2004.
- Beckage**, B. (PI) and W. J. Platt. \$150,000. The effects of hurricane-fire interactions on the population dynamics of South Florida Slash Pine. National Park Foundation and Andrew W. Mellon Foundation Research Grant. Jan 2001-Jan 2004.

PRESENTATIONS

- Beckage**, B. 2010. Fire, feedbacks, and the dynamics of ecological communities. Department of Ecology and Evolutionary Biology, University of Tennessee.
- Beckage**, B. 2009. Climate change, fire, and the dynamics of ecological communities. Department of Mathematics and Statistics, University of Vermont.
- Beckage**, B. 2009. Using Mathematica to explore the role of vegetation-fire feedbacks in structuring ecological communities. International Mathematica User Conference.
- Beckage**, B. and C. Ellingwood. 2009. Fire feedbacks with vegetation and the spatial structure of savannas. International Society for Ecological Modelling.

- Beckage, B.** 2009. Climate change, fire, and the dynamics of ecological communities. Department of Environmental and Plant Biology, Ohio University.
- Beckage, B.** 2008. Climate change, fire, and the dynamics of ecological communities. Department of Mathematics and Statistics, University of Massachusetts, Amherst.
- Beckage, B.** 2008. Climate change, fire, and the dynamics of ecological communities. Department of Plant Biology, UVM.
- Beckage, B.** and L. Gross. 2008. Modeling ecological responses to climate change. Ecological Society of America. Milwaukee, WI.
- Stevens, J.T. and B. **Beckage.** 2008. Fire suppression and invasion by Brazilian pepper (*Schinus terebinthifolius*) in Florida pine savannas. Poster presentation, Ecological Society of America. Milwaukee, WI
- Beckage, B.** 2008. Fire, climate, and the dynamics of ecological communities: Models to management. Everglades National Park, FL.
- Beckage, B.** 2008. Investigating the dynamics of savanna communities using models. Poster presentation at the Vermont EPSCoR Annual Meeting. Burlington, VT.
- Beckage, B.** 2008. Climate change impacts on forests in Vermont. Presentation to the Vermont House Agricultural Committee. Burlington, VT.
- Beckage, B.,** S. Duke-Sylvester, L. Gross, and C. Ellingwood. 2007. Modeling fire in the Florida Everglades using cellular automata, evolutionary algorithms, and empirical likelihood. Ecological Society of America. San Jose, CA.
- Beckage, B.** and C. Ellingwood. 2007. Brazilian pepper, fire, and the invasibility of pine savannas: Exploring nonlinear effects through simulation. Poster presentation, Weed Science Society of America. San Antonio, TX.
- Beckage, B.** 2006. A Multifaceted Approach to Investigating Climate Change and Ecological Communities. Department of Plant Biology, UVM.
- Beckage, B.** 2006. Modeling abrupt ecological responses to climate change. Ecological Society of America. Memphis, TN.
- Beckage, B.** 2006. Reconstructing historic fire regimes and vegetation patterns by linking landscape models to global climate. Greater Everglades Ecosystem Restoration conference, Orlando, FL.
- Beckage, B.** 2005. Why don't pine savannas grow up to forest? Biology Department, UVM.
- Beckage, B.** 2004. Climate, large-scale disturbance, and the dynamics of pine savannas. Dartmouth College, NH.

- Beckage, B.** 2004. Climate, large-scale disturbance, and the dynamics of pine savannas. Harvard Forest, MA.
- Beckage, B.** 2004. Overstory dynamics of pine savannas in response to climate and large-scale disturbance. Pine Rockland Management Symposium, Miami, FL.
- Beckage, B.** 2003. Modeling overstory dynamics of pine savannas: responses to climate and large-scale disturbance. Ecological Society of America. Savanna, GA.
- Beckage, B.** 2002. Does tree mortality in fires depend on past hurricanes? Ecological Society of America. Tucson, AZ.
- Beckage, B.** 2001. Predicting spring fire severity in Everglades National Park. Oral Presentation. Natural Areas Association. Cape Canaveral, FL.
- Beckage, B.** 2001. Influence of Global Climate on Fire Regimes in Everglades National Park. Oral Presentation. Ecological Society of America. Madison, WI.
- Beckage, B.** 2000. Tree Seedling Survival and Growth in southern Appalachian Forests: Effects of Canopy Gaps, Understory Removal, Trenching and Fertilization. Oral Presentation. Ecological Society of America. Snowbird, UT.
- Beckage, B.** 1999. Estimating seedling densities in and out of canopy gaps: A Bayesian change-point analysis. Oral Presentation. Ecological Society of America. Spokane, WA.
- Beckage, B.** 1998. A seedling success story: estimating transition probabilities in the southern Appalachians Oral Presentation. Ecological Society of America. Baltimore, MD.
- Beckage, B.** 1997. Canopy gaps, *Rhododendron maximum* and tree recruitment in the southern Appalachians. Oral Presentation. Ecological Society of America. Albuquerque, NM.
- Beckage, B.** 1997. Understory suppression of seedling recruitment in canopy gaps: evidence from the southern Appalachians. Oral Presentation. Plant Ecology Seminar of the Botany Department, Duke University.

TEACHING

PBIO 195/295, Climate Change Ecology, University of Vermont.

PBIO 295, Data Modeling in the Environmental Sciences, University of Vermont.

BCOR 102, Ecology and Evolution, University of Vermont.

Teaching Assistant, Duke University, Department of Botany, Durham, NC: 1995-2000
Community Ecology, Diversity of Life, General Ecology, Introductory Biology,
Organismal Evolution

Teaching Assistant, University of Central Florida, Department of Biology, Orlando, FL: 1993.
General Botany

INVITED WORKSHOPS AND SYMPOSIA

- Speaker in symposium: Static and dynamic approaches to modelling diversity and complexity. ISEM, October 2009.
- Speaker and symposium organizer: Forecasting future ecosystem states in a time of global change: from models to management. ESA, August 2008.
- Speaker in symposium: Design and analysis of multi-factor experiments. ESA, August 2006
- Speaker in workshop: Application of paleoecological information to restoration and management of the Everglades ecosystem. Greater Everglades Ecosystem Restoration Conference, June 2006.
- Speaker in workshop on uncertainty in ecology, Mathematical Biosciences Institute, Ohio State University, April 2006
- Participant in workshop on spatial ecology, University of Miami, January 2005
- Speaker in symposium: Pine savannas and the role of disturbance in a time of global change. ESA, August 2003
- Participant in working group: A new synthesis of demography and dispersal, National Center for Ecological Analysis and Synthesis, University of California, Santa Barbara. Fall 2001 and Spring 2002.

PROFESSIONAL SERVICE AND SOCIETIES

Handling Editor, *Oecologia* (Jun 2008-Dec 2009); *Panelist*, NSF DIG (Spring 2007); *Secretary*, Statistical Section of ESA, 2004-06;
Ecological Society of America; Society for Mathematical Biology; American Statistical Association