

Curriculum Vitae  
**PAUL R. MOORCROFT**  
Department of Organismic and Evolutionary Biology  
Harvard University  
Cambridge MA 02138  
paul\_moorcroft@harvard.edu

## **RESEARCH INTERESTS**

Ecosystem ecology  
Biosphere-Atmosphere Interactions  
Animal movement

## **EMPLOYMENT**

2005-present Associate Professor, Organismic and Evolutionary Biology, Harvard University  
2001-2005 Assistant Professor, Organismic and Evolutionary Biology, Harvard University  
1997-2001 Research Associate, Princeton Environmental Institute

## **EDUCATION**

Ph.D., Ecology and Evolutionary Biology, Princeton University, June 1997  
M.S., Ecology and Evolutionary Biology, Princeton University, June 1993  
B.A., Zoology, Cambridge University, England, June 1991

## **HONORS AND DISTINCTIONS**

2005 Institute for Advanced Study Residential Fellow, Summer Program in Biological Mathematics  
2001 Isaac Newton Institute for Mathematical Sciences Visiting Scholar  
2000 Yellowstone Ecosystem Studies Research Fellow  
1996 National Science Foundation Program in Mathematical Biology Scholarship  
1991-96 Princeton University Doctoral Fellowship  
1990 Girton College Scholarship

## **GRANTS**

2006-2009 National Aeronautics and Space Administration, Requirements for space-borne fusion of Lidar and Radar measurements of forest 3D structure and above-ground biomass, S.Saatchi, M. Hofton, R. Dubayah and P.R. Moorcroft, \$616,836  
2007-2008 National Aeronautics and Space Administration, Integration of a large-area invasive spread network (LISN) with Climate Models for Decision Support, R.L. Crabtree et al., \$944,145

- 2005-2008 National Aeronautics and Space Administration, ENT: A global dynamic terrestrial ecosystem model for climate interactions at seasonal to century time scales through coupled water, carbon, and nitrogen dynamics N. Kiang et al., \$1,508,200
- 2005-2008 National Science Foundation, Is deforestation changing the hydrologic climate and vegetation of the Amazon? P.R. Moorcroft, R.L. Bras and R. Avissar, \$778,431
- 2004-2007 Department of Energy, Past, present and future rates of terrestrial CO<sub>2</sub> flux in North-Eastern Forests: the role of eco-physiological responses, land-use history & disturbance P.R. Moorcroft, \$221,447
- 2002-2007 National Science Foundation, Continental, landscape and ecosystem scale fluxes of atmospheric CO<sub>2</sub>, S.C. Wofsy, P.R. Moorcroft et al., \$1,600,000
- 2003-2004 Harvard University Center for the Environment, Ecological and environmental impacts of the extinction of core species. D.R. Foster et al., \$48,801
- 2002-2003 William F. Milton Fund, Contributions of increasing atmospheric carbon dioxide and land-use history to current and future carbon accumulation in US forests. P.R. Moorcroft, \$34,956
- 2001-2002 National Aeronautics and Space Administration, Modeling the biogeochemical system of the terrestrial Amazon: issues for sustainability. P.R. Moorcroft, \$25,607

## **PUBLICATIONS**

### Books

P.R. Moorcroft and M.A. Lewis (2006). Mechanistic Home Range Analysis. *Princeton Monographs in Population Biology*, Princeton University Press, Princeton, NJ. 208pp.

### Published or in press

Moorcroft, P.R., 2006 (*Invited feature, 20<sup>th</sup> anniversary issue*). How close are we to a predictive science of the biosphere? *Trends in Ecology and Evolution*, 21: 400-407.

Albani, M., D.M. Medvigy, G.C. Hurtt and P.R. Moorcroft, 2006. The contributions of land-use change, CO<sub>2</sub> fertilization and climate variability to the carbon sink in the Eastern United States. *Global Change Biology*, in press.

Lynch, H.J., R.A. Renkin, and R.L. Crabtree and P.R. Moorcroft. 2006. The influence of previous mountain pine beetle activity on the 1988 Yellowstone fires. *Ecosystems*, in press.

Moorcroft, P.R., M.A. Lewis and S.W. Pacala, 2006. Potential role of natural enemies during tree range expansions following climate change. *Journal of Theoretical Biology*, 241: 601–616.

Ise, T., and P.R. Moorcroft, 2006. The global-scale temperature and moisture dependencies of soil organic carbon decomposition: analysis using a mechanistic decomposition model. *Biogeochemistry*, 80(3): 241-261

Lynch, H.J., R.A. Renkin, and R.L. Crabtree and P.R. Moorcroft, 2006. Insect-fire interactions in Yellowstone National Park: The influence of historical mountain pine beetle (*Dendroctonus ponderosae*) activity on the spatial pattern of the 1988 Yellowstone fires. In *Greater Yellowstone Public Lands: A Century of Discovery, Hard Lessons, and Bright Prospects*, M. Turner (ed.)

Moorcroft, P.R., M.A. Lewis and R.L. Crabtree, 2006. Mechanistic home range models predict spatial patterns and dynamics of coyote territories in Yellowstone. *Proceedings of the Royal Society Series B*, 273: 1651-1659.

Medvigy, D.M., P.R. Moorcroft, R. Avissar and R.L. Walko, 2005. Mass conservation and atmospheric dynamics in the Regional Atmospheric Modeling System (RAMS). *Environmental Fluid Mechanics*, 5: 109-134.

Hurt, G.C., R. Dubayah, J. Drake, P.R. Moorcroft and M. Fearon, 2004. Beyond potential vegetation: Combining Lidar remote sensing and a height-structured ecosystem model for improved carbon stock and flux estimates. *Ecological Applications*, 14: 873-883.

Purves, D.W., J.P. Caspersen, P.R. Moorcroft, G.C. Hurtt and S.W. Pacala 2004. Human-induced changes in U.S. biogenic VOC emissions. *Global Change Biology*, 10: 1737-1755.

Moorcroft, P.R. 2003 (*Invited feature*). Recent advances in ecosystem-atmosphere interactions: an ecological perspective. *Proceedings of the Royal Society Series B*, 270: 1215-1227.

Hurt, G.C., S.W. Pacala, P.R. Moorcroft, J.P. Caspersen, E. Shevliakova and B. Moore, 2002. Projecting the future of the US carbon sink. *Proceedings of the National Academy of Sciences*, 99: 1389-1394.

Moorcroft, P.R., G.C. Hurtt and S.W. Pacala 2001. A method for scaling vegetation dynamics: the ecosystem demography model (ED). *Ecological Monographs*, 74: 557-586.

Pacala, S.W., G.C. Hurtt, D. Baker, P. Peylin, R.A. Houghton, R.A. Birdsey, L. Heath, E.T. Sundquist, R.F. Stallard., P. Ciais, P.R. Moorcroft, J.P. Caspersen, E. Shevliakova, B. Moore, G. Kohlmaier, E. Holland, M. Gloor, M.E. Harmon, S.M. Fan, J.L. Sarmiento, C.L. Goodale, D. Schimel and C.B. Field, 2001. Consistent land- and atmosphere-based U.S. carbon sink estimates. *Science*, 292: 2316-2320.

Pacala, S.W., G.C. Hurtt, P.R. Moorcroft and J.P. Caspersen, 2001. Carbon storage in the US caused by land-use change. In *Present and Future Modeling of Global Environmental Change* ed. T. Matsumo. Terra publications, Tokyo.

Lewis, M.A. and P.R. Moorcroft, 2001. ESS analysis of mechanistic home range models: the value of signals in spatial resource partitioning. *Journal of Theoretical Biology*, 210: 463-474.

Caspersen, J., S.W. Pacala, J. Jenkins, G.C. Hurtt, P.R. Moorcroft and R. Birdsey, 2000. Contributions of land-use history and enhanced tree growth to carbon accumulation in forests. *Science*, 290: 1148-51.

Moorcroft, P.R., M.A. Lewis and R.L. Crabtree, 1999. Analysis of coyote home ranges using a mechanistic home range model. *Ecology*, 80: 1656-1665.

Hurtt, G.C., P. R. Moorcroft, S. W. Pacala and S. A. Levin, 1998. Terrestrial models and global change: challenges for the future. *Global Change Biology*, 4: 581-590.

Moorcroft, P.R., S.D. Albon, J.M. Pemberton and T.H. Clutton-Brock, 1996. Density-dependent selection in a fluctuating ungulate population. *Proceedings of the Royal Society series B*, 263: 31-38.

Moorcroft, P.R. and R.L. Crabtree, 1996. Wolf density in relation to landscape and prey. In *Greater Yellowstone predators: ecology and conservation in a changing landscape*, National Park Service, Yellowstone National Park, WY.

Gulland, F.M.D., S.D. Albon, J.M. Pemberton, P.R. Moorcroft and T.H. Clutton-Brock, 1993. Parasite-associated polymorphism in a cyclic ungulate population. *Proceedings of the Royal Society series B*, 254: 7-13.

In Review/Submitted/In Preparation:

Lynch, H.J. and P.R. Moorcroft, 2006. Spatio-temporal interactions between forest fires and western spruce budworm infestation in British Columbia. In review, *Canadian Journal of Forest Research*.

Medvigy, D.M., S.C. Wofsy, J.W. Munger D.Y. Hollinger and P.R. Moorcroft, 2006. A constrained terrestrial biosphere model for regional and global change studies: The Ecosystem Demography model version 2. In preparation.

Medvigy, D.M., S.C. Wofsy, J.W. Munger, D.Y. Hollinger and P.R. Moorcroft, 2006. Decadal-scale carbon dynamics of the in the Northeastern US and Canada: results from a constrained dynamic biosphere model. In preparation.

Moorcroft, P.R. and M.A. Lewis 2006 Mechanistic home range models and resource selection analysis: a reconciliation. In preparation for *American Naturalist*.

Albani, M., P.R. Moorcroft, A.M. Ellison, D.A. Orwig, and D.R. Foster (2006) Predicting the impact of Hemlock Woolly Adelgid on carbon dynamics of Eastern U.S. forests. In preparation for *Ecological Applications*.

## UNIVERSITY SERVICE

### Department

- 2006-present Physiological Ecology Search Committee
- 2005-present Information Technology Committee
- 2004-present Bullard Fellowship Committee
- 2003-present Biology Concentration Advisor
- 2003-2004 Biology Undergraduate Concentration Committee
- 2003-2004 Fungal Biology Search Committee
- 2001-2004 Committee analyzing teaching and other shared space needs for new building

### University

- 2006-present Faculty Advisory Committee for the Brazilian Studies Program
- 2005-2006 Co-organizer of the Radcliffe Institute for Advanced Study Symposium  
“Biodiversity in the Anthropocene: Perspectives on the Human Appropriation of the Natural World”
- 2004-present Faculty Member, Harvard University Center for the Environment
- 2004-present Faculty Affiliate, Program in Evolutionary Dynamics
- 2003-present Organization for Tropical Studies University Representative

## INVITED SEMINARS

- 2007 Pennsylvania State University, graduate student chosen speaker for departmental ecology seminar series
- 2006 National Science Foundation Division of Biology Theoretical Biology Workshop  
Smithsonian Tropical Forest Research Institute, Barro Colorado Island, Panama  
6<sup>th</sup> Annual Regional Atmospheric Modeling System Conference, Ubatuba, Brazil  
Harvard Forest Long-term Ecological Research Center Annual Meeting
- 2005 Massachusetts Institute of Technology  
University of California Berkeley  
University of Massachusetts  
Duke University  
University of Toronto  
University of Michigan  
Harvard Forest Long-term Ecological Research Center Annual Meeting
- 2004 Massachusetts Institute of Technology  
American Geophysical Union Winter Meeting
- 2003 Society for Mathematical Biology Annual Meeting  
Boston University  
Massachusetts Institute of Technology  
American Geophysical Union Winter Meeting,  
Smithsonian Center for Tropical Forest Science Workshop Seminar
- 2002 University of Alberta  
Harvard Forest  
University of Georgia  
American Geophysical Union Annual Winter Meeting

- 2001 Ecological Society of America  
 Isaac Newton Institute for Mathematics  
 Cambridge University  
 NOAA Geophysical Fluid Dynamics Lab Annual Meeting  
 Dartmouth University  
 Harvard University  
 University of California, Irvine  
 University of California, Santa Barbara  
 University of California, Riverside  
 University of Alberta  
 SUNY Stony Brook
- 2000 University of Utah  
 American Society of Mammalogists Annual Meeting  
 University of Cambridge
- 1999 University of Minnesota
- 1998 Energy Modeling Forum, Snowmass, CO
- 1997 University of Utah  
 Greater Yellowstone Predator Conference, National Park Service, Gardner MT  
 University of Montana

## TEACHING

- 2005-2006 BS55 Ecology: Populations, Communities and Ecosystems (Paul Moorcroft)  
 OEB157 Global Change Biology (Paul Moorcroft and James McCarthy)  
 Informal Plant Ecology Graduate Reading Course
- 2004-2005 BS55 Ecology: Populations, Communities and Ecosystems (Paul Moorcroft)
- 2003-2004 BS55 Ecology: Populations, Communities and Ecosystems (Paul Moorcroft and William H. Bossert)  
 OEB157 Global Change Biology (Paul Moorcroft and James McCarthy)  
 ESPP10 Science, Policy and Environmental Management (William C. Clark, David Cash, Daniel P. Schrag) Taught unit on fisheries management & policy
- 2002-2003 BS55 Ecology: Populations, Communities and Ecosystems (Paul Moorcroft and William H. Bossert)  
 ESPP10 Science, Policy and Environmental Management (William C. Clark, David Cash and Daniel P. Schrag). Taught unit on fisheries management & policy

### Graduate students:

Takeshi Ise, Ph.D. candidate, Organismic and Evolutionary Biology  
 Xiaobi Dong, Ph.D. candidate, Organismic and Evolutionary Biology  
 Heather Lynch, Ph.D., graduated Fall 2006, Organismic and Evolutionary Biology  
 David Medvigy, Ph.D., graduated Spring 2006, Division of Engineering and Applied Sciences

### Graduate thesis committees:

Juan Pablo Giraldo, Ph.D candidate, Organismic and Evolutionary Biology  
Julie Shoemaker, Ph.D. candidate, Organismic and Evolutionary Biology  
Lucy Hutyra, Ph.D. candidate, Dept. of Earth and Planetary Sciences  
Daniel Collins, Ph.D., graduated Spring 2006, Civil Engineering Dept., Massachusetts Institute of Technology  
Ryan Knox Ph.D. candidate, Civil Engineering Dept., Massachusetts Institute of Technology

### Postdoctoral students:

Marco Albani July 2003-July 2005  
Michael Dietze, July 2006-present  
Yeonjoo Kim, October 2006-present

### Undergraduate research:

Theses: Oliver Soong, Sarah Cove, Naupaka Zimmerman, Juliet Lamb, Jackie Hatala  
Courses in reading and research: Pien Huang, Brooke Halsey  
Summer Students: Mary Anderson

## **PROFESSIONAL ACTIVITIES**

### Memberships

NSF Division of Biology, workshop on Theoretical Biology (2006)  
NSF workshop on Ecosystem Modeling in the National Ecological Observatory Network (2005)  
NASA Earth System Science, Global Biomass Inventory and Monitoring Mission Science Team (2004-present)  
NSF Terrestrial Ecosystem Modeling (TERRAC) working group (2004)  
US Global Change Research Program, North American Carbon Plan Tier 3 Working Group (2003)  
NOAA Geophysical Fluid Dynamics Laboratory working group on Land-Atmosphere Interactions (2000-2002)  
Ecological Society of America  
American Geophysical Union

### Journals

Reviewer for: Ecology, Ecology Letters, Global Biogeochemical Cycles, Ecosystems, Ecological Applications, Geophysical Research Letters, Journal of Theoretical Biology, Theoretical Population Biology, Bulletin of Mathematical Biology, Mathematical Biosciences, Deep Sea Research, Conservation Biology, Behavioral Ecology, Proceedings of the Royal Society series B

### Funding Agencies

Panels: Department of Energy, National Institute for Climatic Change Research Program  
National Science Foundation, Biocomplexity Program  
Smithsonian Center for Tropical Forest Science, Research Grants Program

Proposal reviews: National Science Foundation, National Oceanic and Atmospheric Administration, National Aeronautics and Space Administration, Department of Energy, Austrian Science Council, Canadian National Research Council

Public Lectures

The New England Science Center Collaborative Symposium on Climate Change (2006)

Harvard Museum of Natural History Symposium on Biodiversity (2004)

Concord Land Trust (2003)

Harvard Alumni Association Panel on Global Climate Change (2003)

Concord Land Trust (2002)