

Boston University • Department of Geography & Environment • 675 Commonwealth Ave • Boston, MA 02215
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RESEARCH INTERESTS

Interactions between humans and ecosystems including (1) carbon and water cycling (2) ecosystem responses to stressors (both human and climatic); (3) Atmosphere-biosphere interactions; (4) terrestrial ecology; (5) urban ecology.

ACADEMIC APPOINTMENTS

Boston University, *Boston, Massachusetts, USA*

Assistant Professor of Terrestrial Carbon Cycle Science, December 2009 - Present

University of Washington, *Seattle, Washington, USA*

Research Scientist, May 2007 – October 2009

EDUCATION

Harvard University, Cambridge, MA, USA

Ph.D., Department of Earth & Planetary Sciences, April 2007

Thesis: Carbon and Water Exchange in Amazonian Rainforests

Harvard University, Cambridge, MA, USA

A.M, Department of Earth & Planetary Sciences, June 2006

Yale University, New Haven, CT, USA

Graduate coursework, School of Forestry, 1998 – 1999

University of Washington, Seattle, WA, USA

B.S., College of Forest Resources, Forest Ecology and Management, March 1998

GRANTS AND AWARDS

Collaborative Research: Water and Carbon Dynamics in Tropical Peatlands: Comparison of a Forested Peat Dome with a deforested Peat Dome in Borneo (PI). National Science Foundation, EAR: 1114155, 9/2011-8/2014, \$314,288 (Total Award Amount \$599,830).

Metabolism of Boston (PI). Boston University Award, 6/2011-9/2012, \$200,000

Carbon and nitrogen dynamics along an urbanization gradient in Boston, MA. Arnold Arboretum Deland Award granted to PhD Advisee Preeti Rao, 2011-2012. (\$3,650)

Carbon and nitrogen dynamics along an urbanization gradient in Boston, MA. Boston University Biogeosciences Granted to PhD Advisee Preeti Rao, 2011-2012. (\$500)

Urban carbon metabolism travel grant. Boston University, Mary Erskine Award, 2011. (\$2,540)

Collaborative Research: ULTRA-Ex: Metabolism of Boston (CO-PI). National Science Foundation, DEB: 0948857, 9/2010-2/2012, \$209,953 (Total Award Amount \$300,000).

PEER-REVIEWED PUBLICATION

(*ADVISEE-LED)

- (32) Newell, J.D.*, **Hutyra, L.R.**, Phillips, N.G., Gopal, S., Woodcock, C.E., Olofsson, P. Combining multi-source remotely sensed data to map urban tree canopy cover and carbon storage. *Remote Sensing of Environment*, in revision.
- (31) Raciti, S.M.*, **Hutyra, L.R.**, Finzi, A.C. Depleted soil carbon and nitrogen stocks under impervious surfaces: Consequences of urban expansion. *Nature*, in review.
- (30) Raciti, S.M.*, **Hutyra, L.R.**, Rao, P., Finzi, A.C., Soil and vegetation carbon in urban ecosystems: The importance of importance of urban definition and scale. *Ecological Applications*, in review.

- (29) Ivanov, V.Y., **Hutyra, L.R.**, Wofsy, S.C., Munger, J.M., Saleska, S.R., de Olivera, R.C., de Carmargo, P. Root niche speratation can explain avoidance of seasonal drought stress and vulnerability of overstory trees to extended drought in a mature Amazonian forest. *Journal of Hydrology*, in review.
- (28) Miller, S., Goulden, M.L., **Hutyra, L.R.**, Keller, M., Saleska, S., Wofsy, S., Figueira, A., da Rocha, H., de Camargo, P., Reduced Impact Logging Minimally Alters Tropical Rainforest Carbon and Energy Exchange *Proceedings of the National Academy of Sciences of the United States of America*, accepted.
- (27) Kim, Y., Knox, R.G., Longo, M., Medvigy, D., **Hutyra, L.R.**, Pyle, E.H., Wofsy, S.C., Bras, R.L., Moorcroft, P.R., Seasonal carbon dynamics and water fluxes in an Amazonian rainforest. *Global Change Biology*, accepted.
- (26) Alberti, M. and **L.R. Hutyra**. Carbon signatures of development patterns along a gradient of urbanization in Land Use and the Carbon Cycle: Science and Applications in Coupled Natural-Human Systems, accepted.
- (25) **Hutyra, L.R.**, Yoon, B., Hepinstall-Cymerman, J., Alberti, A. Land cover change in the Seattle metropolitan region: An examination of spatio-temporal patterns and carbon consequences. *Landscape and Urban Planning* 103: 83-93, 2011.
- (24) Hepinstall-Cymerman, J., Coe, S., **Hutyra, L.R.** Patterns of land cover change in the central Puget Sound, Washington, 1986-2007, *Urban Ecosystems*, DOI: 10.1007/s11252-011-0206-3, in press.
- (23) **Hutyra, L.R.**, Yoon, B., Alberti, A. Terrestrial carbon stocks across a gradient of urbanization: A study of the Seattle, WA region. *Global Change Biology*, 17: 783-797, 2011.
- (22) Costa, M., Biajoli, M., Saches, L., Malhado, A.C., **Hutyra, L.R.**, Da Rocha, H.R., Aguiar, R. Atmospheric versus vegetation controls of Amazonian tropical rainforest evapotranspiration: are the wet and seasonally dry rainforests any different? *Journal of Geophysical Research - Biogeosciences*, 115, G04021, doi:10.1029/2009JG001, 2010.
- (21) van Haren, J.L.M.R., de Oliveira, C., Restrepo-Coupe, N., **Hutyra, L.R.**, de Carmargo, P.B., Saleska, S.R. Do plant species influence soil CO₂ and N₂O fluxes in a diverse tropical forest? *Journal of Geophysical Research – Biogeosciences*, doi: 10.1111/j.1365-2486.2010.02238.x, 2010.
- (20) Alberti, M. and **L.R. Hutyra**. Detecting Carbon Signatures of Development Patterns across a Gradient of Urbanization: Linking Observations, Models, and Scenarios. *Proceedings of the Fifth Urban Research Symposium 2009: Cities and Climate Change: Responding to an Urgent Agenda*, Vol.1, 1-12, 2009.
- (19) van Gorsel, E., N. Delpierre, R. Leuning, A. Black, J.W. Munger, S. Wofsy, M. Aubinet, C. Feigenwinter, J. Beringer, D. Bonal, B. Chen, J. Chen, R. Clement, K.J. Davis, A. Desai, D. Dragoni, S. Etzold, T. Grünwald, L. Gu, B. Heinesch, **L.R. Hutyra**, W.W.P. Jans, W. Kutsch, B.E. Law, M.Y. Leclerc, I. Mammarella, L. Montagnani, A. Noormets, C. Rebmann, W. Sonia, Estimating nocturnal ecosystem respiration from the vertical turbulent flux and change in storage of CO₂. *Agricultural and Forest Meteorology*, 149: 1919-1930, 2009.
- (18) Grant, R.F., **Hutyra, L.R.**, de Oliveira, R.C., Munger, J.W., Saleska, S.R., Wofsy, S.C., Modeling the carbon balance of Amazonian rainforests: Resolving ecological controls on net ecosystem productivity, *Ecological Monographs*, 79(3): 445-463, 2009.
- (17) Malhi, Y., Aragão, L.E., Metcalfe, D.B., Patiño, S., Quesada, C.A., Almeida, S., Anderson, L., Brando, P., Chambers, J.Q., Costa, A.C.L., Martins, L., **Hutyra, L.R.**, Oliveira, P., Pyle, E.H., Robertson, A.L. Comprehensive assessment of carbon productivity, allocation and storage in three Amazonian forests. *Global Change Biology*. doi: 10.1111/j.1365-2486.2008.01780.x, 2009.
- (16) **Hutyra, L.R.**, Munger, J.W., Pyle, E.H., Saleska, S., Restrepo-Coupe, N., de Camargo, P.B., Wofsy, S.C., Resolving systematic errors in estimates of net ecosystem exchange of CO₂ and ecosystem respiration in a tall-stature forest: application to a tropical forest biome, *Agricultural and Forest Meteorology*, 148: 1266-1279, 2008.
- (15) Pyle, E.H., Santoni, G.W., Nascimiento, H.E.M., **Hutyra, L.R.**, de Carmargo, P.B., Vieira, S., Saleska, S.R., Laurance, W.F., Wofsy, S.C., Dynamics and disequilibria of carbon, biomass, and structure in two Amazonian forests, *Journal of Geophysical Research – Biogeosciences*, 113, G00B08, doi:10.1029/2007JG000592, 2008.
- (14) Luyssaert, S., I. Inglima, M. Jung, A.D. Richardson, M. Reichstein, D. Papale, S.L. Piao, E.D. Schulze,

- L.Wingate, G. Matteucci, L. Aragao, M. Aubinet, C. Beer, C. Bernhofer, K.G. Black, D. Bonal, J.-M. Bonnefond, J.Chambers, P. Ciais, B. Cook, K.J. Davis, A.J. Dolman, B. Gielen, M. Goulden, J. Grace, A. Granier, A. Grelle, T. Griffis, T. Grünwald, G. Guidolotti, P.J. Hanson, R. Harding, D.Y. Hollinger, **L.R. Hutyra**, P. Kolari, B. Kruijt, W. Kutsch, F. Lagergren, T. Laurila, B.E. Law, G. Le Maire, A. Lindroth, D. Loustau, Y. Malhi, J. Mateus, M. Migliavacca, L. Misson, L. Montagnani, J. Moncrieff, E. Moors, J.W. Munger, E. Nikinmaa, S.V. Ollinger, G. Pita, C. Rebmann, O. Roupsard, N. Saigusa, M.J. Sanz, G. Seufert, C. Sierra, M.-L. Smith, J. Tang, R. Valentini, T. Vesala and I.A. Janssens. The CO₂-balance of boreal, temperate and tropical forests derived from a global database. *Global Change Biology*, 13, 2509-2537, 2007.
- (13) **Hutyra, L.R.**, Munger, J.W., Saleska, S.R., Gottlieb, E.W., Daube, B.C., Dunn, A.L., Amaral, D.F., Camargo, P.B., Wofsy, S.C., Seasonal controls on the exchange of carbon and water in an Amazonian rainforest, *Journal of Geophysical Research-Biogeosciences*, 112, G03008, 2007.
- (12) Ichii, K., Hashimoto, H., White, M.A., Potter, C., **Hutyra, L.R.**, Huete, A.R., Myneni, R.B., Nemani, R.R., Constraining rooting depths in tropical rainforests using satellite data and ecosystem modeling for accurate simulation of GPP seasonality, *Global Change Biology*, 13, 67-77, 2007.
- (11) Huete, A.R., Didan, K., Shimabukuro, Y.E., Ratana, P., Saleska, S., **Hutyra, L.R.**, Yang, W., Nemani, R.R. and Myneni, R. Amazon rainforests green-up with sunlight in dry season, *Geophysical Research Letters*, 33, L06405, 2006.
- (10) Liu, W.H., Bryant, D.M., **Hutyra, L.R.**, Saleska, S.R., Hammond-Pyle, E., Curran, D., Wofsy, S.C., Woody debris contribution to the carbon budget of selectively logged and maturing mid-latitude forests., *Oecologia*, 148(1) 108-117, 2006.
- (9) **Hutyra, L.R.**, Munger, J.W., Nobre, C.A., Saleska, S.R., Vieira, S.A., Wofsy, S.C., Climatic variability and vegetation vulnerability in Amazonia, *Geophysical Research Letters*, 32, L24712, 2005.
- (8) Xiao, X.M., Moore, B., Zhang, Q., Saleska, S.R., **Hutyra, L.**, Wofsy, S.C., Frolking, S., Boles, S., Keller, M., Satellite-based modeling of gross primary production in a seasonally moist tropical evergreen forest, *Remote Sensing of Environment*, 94 (1), 105-122, 2005.
- (7) Bain, W.G., **Hutyra, L.**, Patterson, D.C., Bright, A.V., Daube, B.C., Munger, J.W., Wofsy, S.C., Wind-induced error in the measurement of soil respiration using closed dynamic chambers, *Agricultural and Forest Meteorology*, 131 (3-4), 225-232, 2005.
- (6) Vieira, S., de Camargo, P.B., Selhorst, D., da Silva, R., **Hutyra, L.**, Chambers, J.Q., Brown, I.F., Higuchi, N., dos Santos, J., Wofsy, S.C., Trumbore, S.E., Martinelli, L.A., Forest structure and carbon dynamics in Amazonian tropical rain forests, *Oecologia*, 140, 468-479, 2004.
- (5) Rice, A.H., Hammond, E.P., Saleska, S.R., **Hutyra, L.**, Palace, M., Keller, M., de Camargo, P.B., Portilho, K., Marques, D., Wofsy, S.C., Carbon Balance and Vegetation Dynamics in an Old-growth Amazonian Forest, *Ecological Applications*, 14 (4), s55-s71, 2004.
- (4) **Hutyra, L.**, Factors controlling long- and short-term sequestration of atmospheric CO₂ in a mid-latitude forest, in *Ecological Issues in a changing world*, edited by S. Hong, Lee, J.A., Ihm, B., Farina, A., Son, Y., Kim, E., Cheo, J.C., pp. 82-84, Kluwer, Dordrecht, 2004.
- (3) Saleska, S.R., Miller, S.D., Matross, D.M., Goulden, M.L., Wofsy, S.C., da Rocha, H., de Camargo, P.B., Crill, P., Daube, B.C., de Freitas, H.C., **Hutyra, L.**, Keller, M., Kirchhoff, V., Menton, M., Munger, J.W., Pyle, E.H., Rice, A.H., Silva, H, Carbon fluxes in old-growth Amazonian rainforest: seasonality and disturbance-induced net carbon loss, *Science*, 302, 1554-1557, 2003.
- (2) Barford, C.C., Wofsy, S.C., Goulden, M.L., Munger, J.W., Pyle, E.H., Urbanski, S.P., **Hutyra, L.**, Saleska, S.R., Fitzjarrald, D., Moore, K., Factors controlling long- and short-term sequestration of atmospheric CO₂ in a mid-latitude forest, *Science*, 294, 1688-1691, 2001.
- (1) Zwieniecki, M.A., **L. Hutyra**, M.V. Thompson, N.M. Holbrook, Dynamic changes in petiole specific conductivity in red maple (*Acer rubrum* L.), tulip tree (*Liriodendron tulipifera* L.), and northern fox grape (*Vitis labrusca* L.), *Plant Cell Environment*, 23 (4), 407-417, 2000.

OTHER PUBLICATIONS

- Hutyra, L.R., Raciti, S., Phillips, N.G., Munger, J.W. Exploring Space-time Variation in Urban Carbon Metabolism, *Urbanization and Global Environment Change, Viewpoints*, in press.
- Hutyra, L.R. Carbon footprint. *World Book Encyclopedia*, 2011.

SELECT SEMINARS & PRESENTATIONS

- "Carbon cycling across the Boston urban to rural gradient: Integrating emissions estimates and atmospheric observations" Ecological Society of America, Austin, TX, August 2011.
- "The Carbon Metabolism of Boston" International Associate for Landscape Ecology Annual Meeting, Portland, OR, April 2011. [Invited]
- "Boston's Urban Metabolism" Harvard Forest Long-Term Ecological Research Area Annual Meeting, Petersham, MA, March 2011. [Invited]
- "Boston's Urban Metabolism" Harvard University January Term course, *Reading and Conserving New England: Interdisciplinary Insights into a landscape's Past, Present, and Future*, January 2011. [Invited]
- "Carbon dynamics across gradients of urbanization: Contrasting results from Boston and Seattle," American Geophysical Union Fall Meeting, San Francisco, CA, December 2010.
- "Impacts of disturbance and recovery dynamics in an Amazonian rainforest," Boston University Terrestrial Biogeoscience Seminar Series, Boston, MA, November 2010. [invited]
- "Terrestrial carbon dynamics across gradients of urbanization: Contrasting results from Boston and Seattle," International Conference on Urbanization and Global Change, Phoenix, AZ, October 2010.
- "Terrestrial carbon cycling across urban to rural gradients," Harvard Forest Summer Seminar Series, Petersham, MA, June 2010. [invited]
- "Terrestrial carbon dynamics across gradients of urbanization," Emerging Issues Along Urban-Rural Gradients, Atlanta, GA, April 2010.
- "Seasonal and annual controls on forest carbon exchange," New Phytologist Symposium: Carbon cycling in tropical ecosystems. Guangzhou, China. November 2009. [Invited]
- "Urbanization, terrestrial vegetation structure, and the carbon cycle: Results from the Seattle, WA region" King County, Land and Water Division – Fall Science Seminar. Seattle, WA, October 2009. [invited]
- "Validation of ecosystem carbon exchange estimates," Workshop on monsoon Asia tropical forest dynamics and sustainability, Khon Kaen, Thailand, January 2009. [Invited]
- "Detecting Carbon Signatures of Development Patterns across a Gradient of Urbanization: Linking Observations, Models, and Scenarios," Urban Research Symposium 2009 on Cities and Climate Change: Responding to an Urgent Agenda, Marseilles, France, June 2009.
- "Biodiversity in human dominated landscape: An urban ecology perspective," Biodiversity in a rapidly changing world, 9th national conference on science, policy, and the environment, Washington DC, December 2008.
- "Impacts of alternative development patterns on aquatic ecosystems: Evidence from Puget Sound lowland sub-basins," Western Division of the American Fisheries Societies Symposium, Portland, OR, May 2008. [Invited]
- "Discontinuities, criticality, & resilience in urban landscapes," US-IALE Symposium, Madison, WI, April 2008
- "Carbon and water exchange in Amazonian rainforests," University of Washington, Water Center Seminar, Seattle, WA, February 2008 [Invited]
- "Seasonal controls on the exchanges of carbon and water in an Amazonian rainforest," University of Washington, Program on Climate Change Seminar, Seattle, WA, October 2007 [Invited]
- "Carbon & water exchange in Amazonian rainforests," Massachusetts Institute of Technology, Hydrology Seminar Series, Cambridge, MA, April 2007 [Invited]
- "Effects of disturbance on biomass, structure and carbon balance in two Amazonian Forests," NASA LBA-ECO, Salvador, Brazil, September 2007
- "Resolving systematic errors in estimates of net ecosystem exchange of CO₂ and ecosystem respiration in a tall-stature forest: application to a tropical forest biome," NASA LBA-ECO, Salvador, Brazil, September 2007
- "What is the role of climate in controlling the exchange of carbon and water in an Amazonian rainforest?," NASA LBA-ECO conference, Sao Paulo, Brazil, October 2006
- "Climatic variance and vulnerability in Amazonia," NASA LBA-ECO Conference, November 2005
- "Carbon balance and seasonality in an old-growth Amazon rainforest: Seeing both the forest and the trees," Harvard

University, Herbaria Seminar Series, Cambridge, MA, Fall 2003

“Factors controlling long- and short-term sequestration of atmospheric CO₂ in a mid-latitude forest,” International Congress of Ecology & INTECOL meeting, Seoul, South Korea. August 2002. [Invited]

“Preliminary effects of selective harvest on carbon stocks and stand structure to the Prospect Hill Tract,” Harvard Forest Annual Symposium, Petersham, MA, April 2002.

TEACHING

Boston University

Terrestrial Ecosystems and the Carbon Cycle (GE 456/656, graduate & undergraduate; taught Fall 2010 and Fall 2011)

Natural Environments: The Physical Landscape, (GE 104, undergraduate; taught Spring 2010 and Spring 2011).

University of Washington

URBDP 498, Environmental Planning (URBDP 498, graduate and undergraduate; taught Fall 2009)

Harvard University

The Atmosphere (Science A-30, undergraduate; Head Teaching Fellow, 2004 & 2006; Teaching Fellow 2001)

City of Cambridge, MA

Cambridge Science Club for Girls, 2005

ADVISING

Post-Doctoral Fellows

Steve Raciti (4/2010-present)

Current Students

Brittian Briber, Ph.D. Geography and Environment (Advisor, 2010-present)

Ha Nguyen, Ph.D. Geography and Environment (Advisor, 2011-present)

Preeti Rao, Ph.D. Geography and Environment (Advisor, 2010-present)

Conor Gately, Ph.D. Geography and Environment (Reader)

Eli Melaas, Ph.D. Geography and Environment (Reader)

Damien Sulla-Menashe, Ph.D. Geography and Environment (Reader)

Rose Abramoff, Ph.D. Biology (Reader)

Poliana Lemos, Ph.D. Biology (Reader)

Andy Reinmann, Ph.D. Biology (Reader)

Hollie Emery, M.S. Earth Sciences (Reader)

Graduated Students

Jared Newell (2010), M.S. Geography (Reader)

SERVICE

Boston University Service

Natural Sciences Curriculum Committee, College of Arts and Sciences, 2010-present

Organizer for BU Alumni College “Sustainability in the City”

Advisor board member for the Boston University Global Ecology Education graduate certificate program
Science & Engineering Day Judge, 3/2010

Panelist

Boston University, New Faculty Orientation, 8/2011

Boston University, New Faculty Orientation, 10/2010

Columbia University, Lamont-Doherty Earth Observatory, Women Faculty in Science panelist (4/2010)

Invited Journal Reviewer

Agricultural & Forest Meteorology, Biogeosciences, Climate Dynamics, Forest Ecology and Management, Global Change Biology; Journal Climate, Journal of Geophysical Research – Biogeosciences, Proceedings of the National Academy of the United States of America (PNAS), Remote Sensing, New Phytologist, Journal of Photogrammetry and Remote Sensing.

Invited Grant Reviews

National Science Foundation: Ecosystem Sciences (ad-hoc reviewer); National Science Foundation: Climate & Large Scale Dynamics (ad-hoc reviewer); National Aeronautics and Space Administration: Terrestrial Ecology Program (ad-hoc and panel reviews); Department of Defense: Strategic Environmental Research and Development Program (panel reviewer); United States Department of Agriculture: Soils and Global Change Program (panel reviewer).

Conference Session Chair/Convener

Characterizing, Modeling and Extending Urban Metabolism (American Geophysical Union Annual Meeting, December 2011, San Francisco, CA), Integration studies, monitoring, and modeling studies (Workshop on Monsoon Asia Tropical Forest Carbon Dynamics and Sustainability, January 2009, Khon Kaen, Thailand), Forest Dynamics and Disturbance (NASA LBA-ECO Science Team Meeting, September 2007, Salvador, Brazil), Carbon Fluxes in Upland Ecosystems (NASA LBA-ECO Science Team Meeting, October 2006, Sao Paulo, Brazil).

OTHER EMPLOYMENT

Harvard University, Cambridge, Massachusetts, USA

Research Assistant, under Dr. Steven C. Wofsy, June 1999 – September 2002

Investigated carbon and water cycle dynamics in temperate, boreal, and tropical forested ecosystems through coupling of ground-based forest biometry measurements and tower based eddy covariance measurements.

Weyerhaeuser Co., Federal Way, Washington, USA

Environmental & Analytical Sciences Research Technician, April 1996 – May 1998