

Harvard Forest publications (Wofsy group)

1. Bakwin PS, Davis KJ, Yi C, Wofsy SC, Munger JW, Haszpra L, Barcza Z, Regional carbon dioxide fluxes from mixing ratio data, *Tellus Ser. B, -CHEMICAL AND PHYSICAL METEOROLOGY* 56 (4): 301-311 SEP 2004
2. Barford, Carol C., Steven C. Wofsy, Michael L. Goulden, J. Wm. Munger, Elizabeth Hammond Pyle, Shawn P. Urbanski, Lucy Hutyra, Scott R. Saleska, David Fitzjarrald, Kathleen Moore, Factors controlling long and short term sequestration of atmospheric CO₂ in a mid-latitude forest, *Science* 294 (5547): 1688-1691, 2001.
3. Barnes, D. H., S. C. Wofsy, B. P. Fehlau, E. W. Gottlieb, J. W. Elkins, G. S. Dutton, and S. A. Montzka, Urban/Industrial Pollution for the New York City – Washington, D. C. Corridor, 1996–1998: 1. Providing Independent Verification of CO and PCE Emissions Inventories, *J. Geophys. Res.*, 108(D6), 4185, doi:10.1029/2001JD00116, 2003.
4. Barnes, D. H., S. C. Wofsy, B. P. Fehlau, E. W. Gottlieb, J. W. Elkins, G. S. Dutton, and S. A. Montzka, Urban/Industrial Pollution for the New York City – Washington, D. C. Corridor, 1996–1998: 2. A Study of the Efficacy of the Montreal Protocol and Other Regulatory Measures, *J. Geophys. Res.*, 108(D6), 4186, doi:10.1029/2001JD00117, 2003.
5. Barnes, D. H., S. C. Wofsy, B. P. Fehlau, E. W. Gottlieb, J. W. Elkins, G. S. Dutton, and P. C. Novelli, Hydrogen in the Atmosphere: Observations above a Forest Canopy in a Polluted Environment, *J. Geophys. Res.*, 108(D6), 4197, doi:10.1029/2001JD00199, 2003.
6. Goldstein, A. H., C.M. Spivakovsky, and S. C. Wofsy. Seasonal Variations of Non-Methane Hydrocarbons in Rural New England: Constraints on OH Concentrations in Northern Midlatitudes. *J. Geophys. Res.* 100: 21023-21033, 1995.
7. Goldstein, A. H., S.M. Fan, M.L. Goulden, J.W. Munger, S.C. Wofsy. Emissions of ethene, propene, and 1-butene by midlatitude deciduous forest by a Midlatitude Forest. *J. Geophys. Res.* 101: 9149-9157, 1996.
8. Goldstein, A.H., Daube, B.C., Munger, J.W., and S. C. Wofsy, Automated In-Situ Monitoring of Atmospheric Non-Methane Hydrocarbon Concentrations and Gradients. *J. Atmos. Chem.* 21: 43-59, 1995.
9. Goldstein, A.H., M. L. Goulden, J. W. Munger, S. C. Wofsy, and C. D. Geron, Seasonal Course of Isoprene Emissions from a Midlatitude Deciduous Forest, *J. Geophys. Res.* 103, p. 31,045-31,051, 1998.
10. Goulden, M. L., J. W. Munger, S.-M. Fan, B. C. Daube, and S. C. Wofsy, Effects of interannual climate variability on the carbon dioxide exchange of a temperate deciduous forest, *Science* 271: 1576-1578, 1996.
11. Goulden, M. L., J. W. Munger, S.-M. Fan, B. C. Daube, and S. C. Wofsy, Measurements of carbon storage by long-term eddy correlation: Methods and a critical evaluation of accuracy, *Global Change Biology* 2: 169-182, 1996.
12. Gu, Lianhong, Dennis D. Baldocchi, Steven C. Wofsy, J. William Munger, Joseph J. Michalsky, Shawn P. Urbanski, Thomas A. Boden, Response of a deciduous forest to the Mt. Pinatubo eruption: Enhanced photosynthesis, *Science* 299, 2035-2038, 28 MARCH 2003.

13. Hirsch, A. I., J. W. Munger, D. J. Jacob, L. W. Horowitz and A. H Goldstein, Seasonal variation of the ozone production efficiency per unit NO_x at Harvard Forest, Massachusetts, *J. Geophys. Res.*, *101*, 12659-12666, 1996.
14. Horii, C. V., M. S. Zahniser, D. D. Nelson, J. B. McManus, S. C. Wofsy, Nitric Acid and Nitrogen Dioxide Flux Measurements: a New Application of Tunable Diode Laser Absorption Spectroscopy, *SPIE 3758*, 152-161, 1999.
15. Horii, CV; Munger, JW; Wofsy, SC; Zahniser, M; Nelson, D; McManus, JB. 2004. Fluxes of nitrogen oxides over a temperate deciduous forest. *J. Geophys. Res-ATMOSPHERES* 109 (D8): art. no.-D08305.
16. Kell B. Wilson, Dennis Baldocchi, Eva Falge, Marc Aubinet, Paul Berbigier, Christian Bernhofer, Han Dolman, Chris Field, Allen Goldstein, Andre Granier, Dave Hollinger, Gabriel Katul, B.E. Law, Tilden Meyers, John Moncrieff, Russ Monson, John Tenhunen, Riccardo Valentini, Shashi Verma Steven C. Wofsy, The diurnal centroid of ecosystem energy and carbon fluxes at FLUXNET sites. *J. Geophys. Res.* /jd1349 (in press, 2003).
17. Lai, CT; Ehleringer, JR; Tans, P; Wofsy, SC; Urbanski, SP; Hollinger, DY. 2004. Estimating photosynthetic C-13 discrimination in terrestrial CO₂ exchange from canopy to regional scales. *GLOBAL BIOGEOCHEMICAL CYCLES* 18 (1): art. no.-GB1041, 2004.
18. Lefer, B. L., R. W. Talbot, and J. W. Munger, Nitric acid and ammonia at a rural northeastern U. S. site, *J. Geophys. Res.*, *104*, 1645-1661, 1999.
19. Lin, C.-Y. C., D. J. Jacob, J. W. Munger, and A. M. Fiore, Increasing background ozone in surface air over the United States, *Geophys. Res. Lett*, *27*, 3465-3468, 2000.
20. Moody, J. L., J. W. Munger, A. H. Goldstein, D. J. Jacob, and S. C. Wofsy, Harvard Forest regional-scale air mass composition by Patterns in Atmospheric Transport History, *J. Geophys. Res.* *103*, 13181-13194, 1998.
21. Munger, J. W., C. Barford, and S. C. Wofsy, Exchanges between the forest and the atmosphere, in *Forest Landscape Dynamics in New England, Ecosystem Structure and Function as a Consequence of History*, D. Foster and J. Aber, eds., 2003.
22. Munger, J. W., S. C. Wofsy, P. S. Bakwin, S.-M. Fan, M. L. Goulden, B. C. Daube, A. H. Goldstein, K. Moore, and D. Fitzjarrald, Atmospheric deposition of reactive nitrogen oxides and ozone in a temperate deciduous forest and a sub-arctic woodland. 1. Measurements and mechanisms, *J. Geophys. Res.* *101*: 12639- 12657, 1996.
23. Munger, J. W., S.-M. Fan, P S. Bakwin, M. L. Goulden, A. H. Goldstein, A. S. Colman, and S. C. Wofsy, Regional budgets for Nitrogen Oxides from Continental Sources: Variations of rates for oxidation and deposition with season and distance from source regions. *J. Geophys. Res.* *103*: 8355-8368, 1998.
24. Potosnak, M. J. S. C. Wofsy, A. S. Denning, T. J. Conway, J. W. Munger, and D. H. Barnes. Influence of biotic exchange and combustion sources on atmospheric CO₂ concentrations in New England from observations at a forest flux tower. *J. Geophys. Res.*, *104*: 9561-9569, 1999.
25. Turner, David P. , William D. Ritts, Warren B. Cohen, Stith T. Gower , Maosheng Zhao , S. W. Running , S. C. Wofsy , S. P. Urbanski , A. L. Dunn, and J.W. Munger, Scaling Gross Primary Production (GPP) over Boreal and Deciduous Forest Landscapes in Support of MODIS GPP Product Validation, *Remote Sensing of the Environment* *88*, 256-270, 2003.

26. Turner, David P., Shawn P. Urbanski, Dale Bremer, Steven C. Wofsy, Tilden Meyers, Stith T. Gower, Matthew Gregory A Cross-biome Comparison of Daily Light Use Efficiency for Gross Primary Production, *Global Change Biology (in press, 2003)*.
27. Wofsy, S. C., M. L. Goulden, J. W. Munger, S.-M. Fan, P. S. Bakwin, B. C. Daube, S. L. Bassow, and F. A. Bazzaz, Net Exchange of CO₂ in a Midlatitude forest, *Science*, 260, 1314-1317, 1993.
28. Xiao, X., Q. Zhang, S. Saleska, L. Hutyyra, P. De Camargo, S. Wofsy, S. Frolking, S.Boles, M. Keller, B. Moore III, Satellite-based modeling of gross primary production in a seasonally moist tropical evergreen forest, *Remote Sensing of the Environment (in press, 2004)*
29. Xiao, XM; Zhang, QY; Braswell, B; Urbanski, S; Boles, S; Wofsy, S; Berrien, M; Ojima, D. 2004. Modeling gross primary production of temperate deciduous broadleaf forest using satellite images and climate data. *REMOTE SENSING OF ENVIRONMENT* 91 (2): 256-270.
30. Yi CX, Li RZ, Bakwin PS, Desai A, Ricciuto DM, Burns SP, Turnipseed AA, Wofsy SC, Munger JW, Wilson K, Monson RK A nonparametric method for separating photosynthesis and respiration components in CO₂ flux measurements , *Geophys. Res. Lett.S 31 (17): Art. No. L17107 S*, 2004.

Results of collaborative publications that use Harvard Forest Data (published, in press, and in review)

1. Amthor, J.S., M. L. Goulden, J. W. Munger, and S. C. Wofsy, Testing a mechanistic model of forest-canopy mass and energy exchange using eddy correlation: carbon dioxide and ozone uptake by a mixed oak-maple stand. *Aust. J. Plant Physiol.* 21: 623-651, 1994.
2. Bakwin, P. S., K. J. Davis, C. Yi, S. C. Wofsy, J. W. Munger, L. Haszpra and Z. Barcza Regional Carbon Dioxide Fluxes from Mixing Ratio Data, Submitted to *Tellus*, 2003.
3. Baldocchi, D., et al., FLUXNET: A new tool to study the temporal and spatial variability of ecosystem—scale carbon dioxide, water vapor, and energy flux densities, *Bull. Am. Met. Soc.* 82, 2415-2434, 2001.
4. Chin, M., D. J. Jacob, and J. W. Munger, Relationship of Ozone and Carbon Monoxide over North America and its Implication for Ozone Production and Transport, *J. Geophys. Res.*, 99, 14565-14573, 1994.
5. Curtis, P. S., P. J. Hanson, P. Bolstad, C. Barford, J. C. Randolph, H.P. Schmid, K. B. Wilson Biometric and eddy-covariance based estimates of annual carbon storage in five eastern North American deciduous forests *Agric. Forest Met* 113, 3-19, 2002.
6. Falge E, Baldocchi D, Olson R, Anthoni P, Aubinet M, Bernhofer C, Burba G, Ceulemans R, Clement R, Dolman H, Granier A, Gross P, Grunwald T, Hollinger D, Jensen NO, Katul G, Keronen P, Kowalski A, Lai CT, Law BE, Meyers T, Moncrieff H, Moors E, Munger JW, Pilegaard K, Rannik U, Rebmann C, Suyker A, Tenhunen J, Tu K, Verma S, Vesala T, Wilson K, Wofsy S, Gap filling strategies for defensible annual sums of net ecosystem exchange *Agric. Forest Met.* 107 43-69, 2001.
7. Falge E, Baldocchi D, Olson R, Anthoni P, Aubinet M, Bernhofer C, Burba G, Ceulemans R, Clement R, Dolman H, Granier A, Gross P, Grunwald T, Hollinger D,

- Jensen NO, Katul G, Keronen P, Kowalski A, Lai CT, Law BE, Meyers T, Moncrieff H, Moors E, Munger JW, Pilegaard K, Rannik U, Rebmann C, Suyker A, Tenhunen J, Tu K, Verma S, Vesala T, Wilson K, Wofsy S, Gap filling strategies for long term energy flux data sets. *Agric. Forest Met.* 107, 71-77, 2001.
8. Falge, E., D. Baldocchi, J. Tenhunen, M. Aubinet, P. Bakwin, P. Berbigier, C. Bernhofer, G. Burba, R. Clement, K. J. Davis, J. A. Elbers, A. H. Goldstein, A. Grelle, A. Granier, J. Guomundsson, D. Hollinger, A. S. Kowalski, G. Katul, B. E. Law, Y. Malhi, T. Meyers, R. K. Monson, Seasonality of ecosystem respiration and gross primary production as derived from FLUXNET measurements, *Agr. Forest Met*, 113, 53-74, 2002.
 9. Falge, E., J. Tenhunen, D. Baldocchi, M. Aubinet, P. Bakwin, P. Berbigier, C. Bernhofer, J. M. Bonnefond, G. Burba, R. Clement, K. J. Davis, J. A. Elbers, M. Falk, A. H. Goldstein, A. Grelle, A. Granier, T. Grunwald, J. Gudmundsson, D. Hollinger, I. A. Janssens, P. Keronen, A., Phase and amplitude of ecosystem carbon release and uptake potentials as derived from FLUXNET measurements, *Agr. Forest Met*, 113, 75-95, 2002
 10. Gu, Lianhong, Dennis D. Baldocchi, Steven C. Wofsy, J. William Munger, Joseph J. Michalsky, Shawn P. Urbanski, Thomas A. Boden, Response of a deciduous forest to the Mt. Pinatubo eruption: Enhanced photosynthesis, *Science* 299, 2035-2038, 28, 2003.
 11. Hurst, J. M., D. J. Barket, Jr., O. Herrera-Gomez, T. L. Couch, P. B. Shepson, I. Faloon, D. Tan, W. Brune, H. Westberg, B. Lamb, T. Biesenthal, V. Young, A. H. Goldstein, J. W. Munger, M. A. Carroll, and T. Thornberry, Investigation of the Nighttime Decay of Isoprene, *J. Geophys. Res.*, 106, 24,335-24,346, 2001.
 12. Law, B. E., E. Falge, L. Gu, D. D. Baldocchi, P. Bakwin, P. Berbigier, K. Davis, A. J. Dolman, M. Falk, J. D. Fuentes, A. Goldstein, A. Granier, A. Grelle, D. Hollinger, I. A. Janssens, P. Jarvis, N. O. Jensen, G. Katul, Y. Mahli, G. Matteucci, T. Meyers, R. Monson, W. Munger, W. Environmental controls over carbon dioxide and water vapor exchange of terrestrial vegetation, *Agric. For. Met*, 113,97-120, 2002,
 13. Law, B. E., P. Bakwin, D.D. Baldocchi, T. Boden, K. Davis, D. Hollinger, W. Munger, A. Nobre, S.W. Running, S. Wofsy, S. Verma, The AmeriFlux Network Paradigm for Measuring and Understanding the Role of the Terrestrial Biosphere in Global Climate Change, submitted to *BioScience*, 2002.
 14. Liang, J., L. W. Horowitz, D. J. Jacob, Y. Wang, A. M. Fiore, J. A. Logan, G. M. Gardner, and J. W. Munger, Seasonal budgets of reactive nitrogen species and ozone over the United States, and export fluxes to the global atmosphere, *J. Geophys. Res.*, 103, 13,435-13,450, 1998.
 15. Moore, K. E., D. R. Fitzjarrald, R. K. Sakai, M. L. Goulden, J. W. Munger, and S. C. Wofsy, 1996. Seasonal variation and turbulent exchange at a deciduous forest in Massachusetts, *J. Appl. Met.* 35: 122-134, 1996.
 16. Sigler, J.M., X. Lee, and W. Munger, Emission and long-range transport of mercury from a large-scale Canadian boreal, forest fire, submitted to *Environ. Sci. Tech.* 2003.
 17. Turner, D. P., W. D. Ritts, W. B. Cohen, S. T. Gower, M. Zhao, S. W. Running, S. C. Wofsy, S. Urbanski, A. Dunn, and J. W. Munger, Scaling Gross Primary Production (GPP) over Boreal and Deciduous Forest Landscapes in Support of MODIS GPP Product validation, *Remote Sensing of Environment (in review)* 2003.

18. Turner, David P., Shawn P. Urbanski, Dale Bremer, Steven C. Wofsy, Tilden Meyers, Stith T. Gower, Matthew Gregory A Cross-biome Comparison of Daily Light Use Efficiency for Gross Primary Production, *Global Change Biology* 9, 383-395, 2003.
19. Waring, R. H., B. E. Law, M. L. Goulden, S. L. Bassow, R. W. McCreight, S. C. Wofsy, and F. A. Bazzaz, Scaling Gross Ecosystem Production at Harvard Forest with remote sensing: a comparison of estimates from a constrained quantum-use efficiency model and eddy correlation, *Plant, Cell and Environment*, 18: 1201- 1213, 1996.
20. Williams, M., E. B. Rastetter, D. Fernandes, M. L. Goulden, S. C. Wofsy, G. R. Shaver, J. M. Melillo, K. J. Nadelhoffer, S.-M. Fan, and J. W. Munger, Modeling the soil-plant-atmosphere continuum in a Quercus-Acer stand at Harvard Forest: the regulation of stomatal conductance by light, nitrogen, and soil/plant hydraulic properties, *Plant, Cell and Environment* 19: 911-927 1996.
21. Wilson, K. B., D. Baldocchi, E. Falge, M. Aubinet, P. Berbigier, C. Bernhofer, H. Dolman, C. Field, A. Goldstein, A. Granier, D. Hollinger, G. Katul, B.E. Law, T. Meyers, J. Moncrieff, R. Monson, J. Tenhunen, R. Valentini, S. Verma, S. C.. Wofsy, The diurnal centroid of ecosystem energy and carbon fluxes at FLUXNET sites. *J. Geophys. Res.* 108 (D21), 4664, doi:10.1029/2001JD001349, 2003.
22. Wilson, K. B., . D. Baldocchi, M. Aubinet, P. Berbigier, C. Bernhofer, H. Dolman, E. Falge, C. Field, A. Goldstein, A. Granier, A. Grelle, T. Halldor, D. Hollinger, G. Katul, B. E. Law, A. Lindroth, T. Meyers, J. Moncrieff, R. Monson, W. Oechel, J. Tenhunen, R. Valentini, S. Verma, T. Vesala, S. Wofsy, Energy partitioning between latent and sensible heat flux during the warm season at Fluxnet sites, *Water Resources Research*, 38, 94, doi:10.1029/2001WR000989, 2002.