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APPOINTMENTS

Harvard University, Department of Organismic and Evolutionary Biology, Cambridge, MA.

Assistant Professor (2009–present). Affiliated with the Harvard University Herbaria; Faculty associate of the Weatherhead Center for International Affairs and Harvard University Center for the Environment.

University of New Hampshire, Complex Systems Research Center, Institute for the Study of Earth, Oceans and Space (EOS), Durham, NH. Research Assistant Professor (2007–2009); Research Scientist (2005–2007); Post-doctoral Research Associate (2003–2005).

EDUCATION

University of New Hampshire, Complex Systems Research Center. Postdoc, July 2003–July 2005. Co-advisors John D. Aber and David Y. Hollinger (USDA Forest Service).

Yale University, Graduate School of Arts and Sciences. Program: Forestry & Environmental Studies. Ph.D. degree, with Distinction, May 2003. Co-advisors Graeme P. Berlyn and Xuhui Lee.

Yale University, School of Forestry & Environmental Studies, New Haven, CT. M.F. degree, May 1998.

Massachusetts Institute of Technology, Cambridge, MA. Graduate-level coursework in Economics. September 1994–March 1995.

Princeton University, Princeton, NJ. A.B. degree, *summa cum laude*, in Economics, May 1992.

ACADEMIC HONORS AND PRIZES

Yale University. Hutchinson Fellowship, Yale Institute of Biospheric Studies, 1999; University Scholar, 1998–2002; Forestry & Environmental Studies Fellowship, 1996–1998.

Princeton University. Phi Beta Kappa and Highest Honors; Halbert White '72 Prize (top student in the Economics Department); Senior Thesis, "An Econometric Analysis of the Auction Market for Impressionist and Modern Pictures, 1980-1991," awarded the American Studies Program's Grace May Tilton Prize (for writing about fine arts) and the Economics Department's Wolf Balleisen Memorial Prize (for top thesis in the Department), 1992.

RESEARCH GRANTS AND CONTRACTS

Department of Energy, Division of Biological and Environmental Research, Climate and Environmental Sciences, "Improving models to predict phenological responses to global change," \$40,560 to PI **A.D. Richardson** (June 2012).

- National Science Foundation, Division of Environmental Biology, Long Term Ecological Research Program**, “HFR LTER V: New Science, Synthesis, Scholarship, and Strategic Vision for Society,” \$5,879,997 (6 y) to PI D. Foster; numerous co-PIs including **A.D. Richardson**. Richardson budget \$119,994 (June 2012).
- National Science Foundation, Improvements in Facilities, Communications, and Equipment at Biological Field Stations and Marine Laboratories (FSML) Program**, “FSML: Walk-up towers for research, education, communication, and outreach at the Harvard Forest,” \$347,764 to PI A. Ellison; Co-PIs **A.D. Richardson**, J.W. Munger, D. Orwig (June 2012).
- Department of Energy, Terrestrial Carbon Cycle Research Program**, “Supporting carbon cycle and earth systems modeling with measurements and analysis from the Howland AmeriFlux site,” \$1,048,730 to PI D.Y. Hollinger; Co-PIs: E.Davidson, D.B. Dail, **A.D. Richardson**, N. Scott, C.-T. Lai. Harvard budget: \$284,357 (June 2011).
- National Oceanic and Atmospheric Administration, Climate Program Office, Global Carbon Cycle Program**, “Improving process-level understanding of the factors underlying long-term trends and year-to-year variability in carbon sequestration of Northeastern forests,” \$389,736 to PI **A.D. Richardson**; Co-PIs: J.W. Munger, G. Bohrer, D. Dragoni, D. Hollinger, P. Moorcroft. Total budget: \$524,736 (June 2011).
- National Science Foundation, Emerging Frontiers, Macrosystem Biology Program**, “Collaborative research: Continental-scale monitoring, modeling, and forecasting of phenological responses to climate change,” \$758,169 to PI **A.D. Richardson**; Co-PIs: M. Friedl, S. Frolking, R. Pless. Total budget (5 y): \$1,525,009 (May 2011).
- National Science Foundation, Division of Environmental Biology, Long Term Ecological Research Program**, “Long-Term Ecological Research at the Hubbard Brook Experimental Forest”, \$4,900,000 (6 y) to PIs T. Fahey and C. Driscoll; numerous co-PIs including **A.D. Richardson**. Harvard budget: \$90,000 (March 2011).
- Milton Fund, Harvard University**, “Nonstructural carbohydrate reserves in forest trees: How does tree size impact the capacity for resilience to stress factors?,” \$39,984 to PI **A.D. Richardson** (December 2010).
- National Aeronautics and Space Administration, Global Climate Change Education Program**, “Data-model fusion and forecasting 21st-Century environmental change in northeastern North America,” \$420,715 to PI A. Ellison; Co-PI: **A.D. Richardson** (August 2010).
- Department of Energy, Terrestrial Carbon Cycle Research Program**, “Evaluating the contribution of climate forcing and forest dynamics to accelerating carbon sequestration by forest ecosystems in the northeastern U.S.,” \$305,000 to PI J.W. Munger; Co-PIs: D. Fitzjarrald, D. Foster, P. Moorcroft, **A.D. Richardson**, and S.C. Wofsy (June 2010).
- National Science Foundation, Research Experience for Undergraduates Program**, “Harvard Forest Summer Research Program in Forest Ecology 2010-2014: Ecological data-model fusion and environmental forecasting for the 21st Century,” \$524,612 to PI A. Ellison; Co-PI: **A.D. Richardson** (February 2010).
- United States Geological Survey/National Parks Monitoring Project**, “Integrated phenological monitoring, analysis, and synthesis to track ecosystem responses to climate change,” \$197,000 to PIs J. Weltzin and Brian Mitchell; Co-PI: **A.D. Richardson**. Harvard budget: \$75,126 (January 2010).
- Department of Energy, National Institute of Climate Change Research (NICCR)**, “Extension of Funding: Reducing uncertainty about the effects of climatic variation on forest ecosystems by measuring, modeling, and analyzing intermediate-turnover carbon pools,” \$80,000 to PI **A.D. Richardson**; Co-PIs: D.B. Dail, D.Y. Hollinger, P. Schaberg. Total budget: \$125,000 (November 2009).
- Northeastern States Research Cooperative**, “Synthesis of data from the PhenoCam network: Phenological Controls on Forest Productivity,” \$69,180 to P.I. **A.D. Richardson** (June 2009).

Department of Energy, Carbon Sequestration Program, “Renewal of Collaborative Research: Economically viable forest harvesting practices that increase carbon sequestration,” \$200,000 to PIs E.A. Davidson and D.B. Dail; Co-PIs: D.Y. Hollinger, **A.D. Richardson**, N.A. Scott (June 2009).

Department of Energy, National Institute of Climate Change Research (NICCR), “Coupling carbon, water and nutrient cycles with data assimilation and multiple constraints”, \$249,396 to P.I. B.H. Braswell; Co-PIs: S.V. Ollinger and **A.D. Richardson** (November 2008).

Northeastern States Research Cooperative, “Carbon benefits of fuel switching from oil to wood across the Northern Forest”, \$43,785 to P.I. A.J. Friedland; Cooperator: **A.D. Richardson**. Subcontract to UNH: \$20,000 (May 2008).

National Aeronautics and Space Administration, ROSES Program, Carbon Cycle Science, “Exploring relationships among carbon cycling, vegetation nitrogen status and surface albedo across North American ecosystems to improve land surface models,” \$796,000 to PI S.V. Ollinger; Co-PIs: M.E. Martin, **A.D. Richardson**, D.Y. Hollinger (November 2007).

United States Department of Agriculture, CSREES NRI, “Soil calcium and reproduction of sugar maple in northeastern forests,” \$397,391 to PI T.J. Fahey; Co-PIs: J. Blum, G. Hawley, **A.D. Richardson**, P. Schaberg. Subcontract to UNH: \$40,000 (May 2007).

Northeastern States Research Cooperative, “Climate change consequences of forest management practices,” \$30,000 to PI D.Y. Hollinger; Co-PI: **A.D. Richardson** (May 2007).

Northeastern States Research Cooperative, “Phenological monitoring across the Northern forest region using a network of digital webcams,” \$74,000 to PI **A.D. Richardson**; Co-PI: D.Y. Hollinger (May 2007).

Department of Energy, National Institute of Climate Change Research (NICCR), “Reducing uncertainty about the effects of climatic variation on forest ecosystems by measuring, modeling, and analyzing intermediate-turnover carbon pools,” \$374,478 to PI **A.D. Richardson**; Co-PIs: D.B. Dail, E.A. Davidson, D.Y. Hollinger, P. Schaberg. UNH budget: \$179,478 (March 2007).

Department of Energy, Terrestrial Carbon Processes Program, “Using model analyses and surface-atmosphere exchange measurements from the Howland AmeriFlux site to improve understanding of forest ecosystem C cycling,” \$900,000 to PI D.Y. Hollinger; Co-PIs: E.A. Davidson, D.B. Dail, **A.D. Richardson**. Subcontract to UNH: \$153,962 (January 2007).

Department of Energy, Carbon Sequestration Program, “Economically viable forest harvesting practices that increase carbon sequestration,” \$652,000 to PIs E.A. Davidson and D.B. Dail; Co-PIs: D.Y. Hollinger, **A.D. Richardson**, N.A. Scott. Subcontract to UNH: \$25,518 (July 2006).

Northeastern States Research Cooperative, “A Synthesis of Climate Change Research in the Northeastern U.S. and Eastern Canada,” \$55,828 to PI L. Rustad; Co-PIs: J.S. Dukes, A. Magill, **A.D. Richardson**, B. Rock, M. Watson, and N. Willard (June 2005).

International Society of Arboriculture, “Non-invasive detection of drought stress in paper birch,” \$5,000 to PIs G.P. Berlyn and **A.D. Richardson** (May 2002).

Andrew Mellon Foundation, “Sun/shade plasticity of two conifers along elevational gradients,” \$28,000 to PIs G.P. Berlyn and **A.D. Richardson** (May 2000).

American Alpine Club Research Fund, “Ecophysiology of red spruce and balsam fir along elevational gradients,” \$800 to PI **A.D. Richardson** (March 1999).

British Columbia Ministry of Forests, “Root studies of Douglas-fir,” CDN\$20,000 contract to **A.D. Richardson** (May 1998).

Carpenter/Sperry Fund, Yale School of Forestry & Environmental Studies, numerous small grants \$300-\$500 to **A.D. Richardson** (1998-2001).

PUBLICATIONS IN PEER-REVIEWED JOURNALS (*Denotes undergraduate author)

Scopus Author ID, 7402534046 (h-index: 34); Thomson Researcher ID, F-5691-2011 (h-index: 32)

- J113. Melaas, E.K., **A.D. Richardson**, M.A. Friedl, D. Dragoni, C.M. Gough, M. Herbst, L. Montagnani, and E. Moors. 2012. Using FLUXNET data to improve models of springtime vegetation activity onset in forest ecosystems. *Agricultural and Forest Meteorology*, in revision.
- J112. Barr, A.G., **A.D. Richardson**, D.Y. Hollinger, D. Papale, M.A. Arain, T.A. Black, G. Bohrer, D. Dragoni, M.L. Fischer, L. Gu, B.E. Law, H.A. Margolis, J.H. McCaughey, J.W. Munger, W. Oechel, and K. Schaeffer. 2012. Use of change-point detection for friction-velocity threshold evaluation in eddy-covariance studies. *Agricultural and Forest Meteorology*, in revision.
- J111. **Richardson, A.D.**, M.S. Carbone, T. Keenan, C. Czimczik, D.Y. Hollinger, P. Murakami, P.G. Schaberg, and X. Xu. 201x. Seasonal dynamics and age of stemwood nonstructural carbohydrates in temperate forest trees. *New Phytologist*, in revision.
- J110. **Richardson, A.D.**, T.F. Keenan, M. Migliavacca, O. Sonnentag, Y. Ryu, and M. Toomey. 201x. Climate change, phenology, and phenological control of vegetation feedbacks to the climate system. *Agricultural and Forest Meteorology*, in press. [Invited review paper]
- J109. Keenan, T.F., E. Davidson, J.W. Munger, and **A.D. Richardson**. 201x. Rate my data: quantifying the value of ecological data for the development of models of the terrestrial carbon cycle. *Ecological Applications*, in press.
- J108. Kuppel, S., P. Peylin, F. Chevallier, C. Bacour, F. Maignan, and **A.D. Richardson**. 201x. Constraining a global ecosystem model with multi-site eddy-covariance data. *Biogeosciences*, in press.
- J107. S.P. Hamburg, M.A. Vadeboncoeur, **A.D. Richardson**, and A.S. Bailey. 201x. Climate change at the ecosystem scale: A 50-year record in New Hampshire. *Climatic Change*, in press.
- J106. Schaefer, K., C. Schwalm, C. Williams, M.A. Arain, A. Barr, J.M. Chen, K.J. Davis, D. Dimitrov, T.W. Hilton, D.Y. Hollinger, E. Humphreys, B. Poulter, B.M. Raczka, **A.D. Richardson**, A. Sahoo, P. Thornton, R. Vargas, H. Verbeeck, R. Anderson, I. Baker, T.A. Black, P. Bolstad, J. Chen, P. Curtis, A.R. Desai, M. Dietze, D. Dragoni, C. Gough, R.F. Grant, L. Gu, A. Jain, C. Kucharik, B. Law, S. Liu, E. Lokipitiya, H.A. Margolis, R. Matamala, J.H. McCaughey, R. Monson, J.W. Munger, W. Oechel, C. Peng, D.T. Price, D. Ricciuto, W.J. Riley, N. Roulet, H. Tian, C. Tonitto, M. Torn, E. Weng, and X. Zhou. 2012. A model-data comparison of gross primary productivity: Results from the North American Carbon Program site synthesis. *Journal of Geophysical Research—Biogeosciences*, 117: Art. No. G03010, doi:10.1029/2012JG001960
- J105. Migliavacca, M., O. Sonnentag, T.F. Keenan, A. Cescatti, J. O’Keefe and **A.D. Richardson**. 2012. On the uncertainty of phenological responses to climate change and its implication for terrestrial biosphere models. *Biogeosciences*, 9: 2063-2083, doi: 10.5194/bg-9-2063-2012
- J104. Hufkens, K., M.A. Friedl, T.F. Keenan, O. Sonnentag, A. Bailey, J. O’Keefe and **A.D. Richardson**. 2012. Ecological impacts of a widespread frost event following early spring leaf-out. *Global Change Biology*, 18: 2365-2377, doi: 10.1111/j.1365-2486.2012.02712.x
- J103. Keenan, T.F., E. Davidson, A. Moffat, W. Munger, and **A.D. Richardson**. 2012. Using model-data fusion to interpret past trends, and quantify uncertainties in future projections, of terrestrial ecosystem carbon cycling. *Global Change Biology*, 18: 2555-2569, doi: 10.1111/j.1365-2486.2012.02684.x
- J102. Cescatti, A., B. Marcolla, S.K. Santhana Vannan, J.Y. Pan, M.O. Román, X. Yang, P. Ciais, R.B. Cook, B.E. Law, G. Matteucci, M. Migliavacca, E. Moors, **A.D. Richardson**, G. Seufert, and C.B. Schaaf. 2012. Intercomparison of MODIS albedo retrievals and in situ measurements across the global FLUXNET network. *Remote Sensing of Environment*, 121: 323-334, doi: 10.1016/j.rse.2012.02.019
- J101. Keenan, T.F., I. Baker, A. Barr, P. Ciais, K. Davis, M. Dietze, D. Dragoni, C.M. Gough, R. Grant, D. Hollinger, K. Hufkens, B. Poulter, H. McCaughey, B. Rackza, Y. Ryu, K. Schaefer, H. Tian,

- H. Verbeeck, M. Zhao, and **A.D. Richardson**. 2012. Terrestrial biosphere model performance for inter-annual variability of land-atmosphere CO₂ exchange. *Global Change Biology*, 18: 1971-1987, doi: 10.1111/j.1365-2486.2012.02678.x
- J100. Sulman, B.N., A.R. Desai, N.M. Schroeder, D. Ricciuto, A. Barr, **A.D. Richardson**, L.B. Flanagan, P.M. Laflour, H. Tian, G. Chen, R.F. Grant, B. Poulter, H. Verbeeck, P. Ciais, B. Ringeval, I.T. Baker, K. Schaefer, Y. Luo, and E. Weng. 2012. Impact of hydrological variations on modeling of peatland CO₂ fluxes: results from the North American Carbon Program site synthesis. *Journal of Geophysical Research—Biogeosciences*, 117: Art. No. G01031, doi:10.1029/2011JG001862
- J099. Wicklein, H.F., S.V. Ollinger, M.E. Martin, D.Y. Hollinger, L.C. Lepine, M.C. Day, M.K. Bartlett*, **A.D. Richardson**, and R.J. Norby. 2012. Variation in foliar nitrogen and albedo in response to nitrogen fertilization and elevated CO₂. *Oecologia*, 169: 915-925, doi: 10.1007/s00442-012-2263-6
- J098. Resco de Dios, V., M.L. Goulden, K. Ogle, **A.D. Richardson**, D.Y. Hollinger, E.A. Davidson, J.G. Alday, G.A. Barron-Gafford, A. Carrara, A.S. Kowalski, W.C. Oechel, B.R. Reverte, R.L. Scott, R.K. Varner, R. Díaz-Sierra, and J.M. Moreno. 2012. Endogenous circadian regulation of carbon dioxide exchange in terrestrial ecosystems. *Global Change Biology*, 18: 1956-1970, doi: 10.1111/j.1365-2486.2012.02664.x
- J097. Hufkens, K., M. Friedl, O. Sonnentag, B.H. Braswell, T. Milliman, and **A.D. Richardson**. 2012. Linking near-surface and satellite remote sensing measurements of deciduous broadleaf forest phenology. *Remote Sensing of Environment*, 117: 307-321, doi:10.1016/j.rse.2011.10.006
- J096. Sonnentag, O., K. Hufkens, C. Teshera-Sterne*, A.M. Young*, M. Friedl, B.H. Braswell, T. Milliman, J. O'Keefe, and **A.D. Richardson**. 2012. Digital repeat photography for phenological research in forest ecosystems. *Agricultural and Forest Meteorology*, 152: 159-177, doi: 10.1016/j.agrformet.2011.09.009
- J095. Elmore, A.J, S.M. Guinn, B.J. Minsley, and **A.D. Richardson**. 2012. Landscape controls on the timing of spring, autumn, and growing season length in mid-Atlantic forests. *Global Change Biology*, 18: 656-674, doi: 10.1111/j.1365-2486.2011.02521.x [Faculty of 1000 Biology selection]
- J094. **Richardson, A.D.**, R.S. Anderson, M.A. Arain, A.G. Barr, G. Bohrer, G. Chen, J.M. Chen, P. Ciais, K.J. Davis, A.R. Desai, M.C. Dietze, D. Dragoni, S.R. Garrity, C.M. Gough, R. Grant, D.Y. Hollinger, H.A. Margolis, H. McCaughey, M. Migliavacca, R.K. Monson, J.W. Munger, B. Poulter, B.M. Raczka, D.M. Ricciuto, A.K. Sahoo, K. Schaefer, H. Tian, R. Vargas, H. Verbeeck, J. Xiao, and Y. Xue. 2012. Terrestrial biosphere models need better representation of vegetation phenology: Results from the North American Carbon Program site synthesis. *Global Change Biology*, 18: 566-584, doi: 10.1111/j.1365-2486.2011.02562.x
- J093. Lee, X., M.L. Goulden, D.Y. Hollinger, A. Barr, T.A. Black, G. Bohrer, R. Bracho, B. Drake, A. Goldstein, L. Gu, G. Katul, T. Kolb, B.E. Law, H. Margolis, T. Meyers, R. Monson, W. Munger, R. Oren, K.T. Paw U, **A.D. Richardson**, H.P. Schmid, R. Staebler, S. Wofsy, and L. Zhao. 2011. Observed increase in local cooling effect of deforestation at higher latitudes. *Nature*, 479: 384-387, doi:10.1038/nature10588
- J092. Groenendijk, M., A. J. Dolman, C. Ammann, A. Arneth, A. Cescatti, D. Dragoni, J. H. C. Gash, D. Gianelle, B. Gioli, G. Kiely, A. Knohl, B. E. Law, M. Lund, B. Marcolla, M. K. van der Molen, L. Montagnani, E. Moors, **A. D. Richardson**, O. Roupsard, H. Verbeeck, and G. Wohlfahrt. 2011. Seasonal variation of photosynthetic model parameters and leaf area index from global FLUXNET eddy covariance data. *Journal of Geophysical Research—Biogeosciences*, 116: Art. No. G04027, doi:10.1029/2011JG001742
- J091. Dietze, M.C., R. Vargas, **A.D. Richardson**, P.C. Stoy, A.G. Barr, R.S. Anderson, M.A. Arain, I.T. Baker, T.A. Black, J.M. Chen, P. Ciais, L.B. Flanagan, C.M. Gough, R.F. Grant, D. Hollinger, C. Izaurralde, C.J. Kucharik, P. Laflour, S. Liu, E. Lokupitiya, Y. Luo, J.W. Munger, C. Peng, B. Poulter, D.T. Price, D.M. Ricciuto, W.J. Riley, A.K. Sahoo, K. Schaefer, A.E. Suyker, H. Tian,

- C. Tonitto, H. Verbeeck, S.B. Verma, W. Wang, and E. Weng. 2011. Characterizing the performance of ecosystem models across time scales: A spectral analysis of the North American Carbon Program site-level synthesis. *Journal of Geophysical Research—Biogeosciences*, 116: Art. No. G04029, doi:10.1029/2011JG001661
- J090. Keenan, T.F., M.S. Carbone, M. Reichstein, and **A.D. Richardson**. 2011. The model-data fusion pitfall: Assuming certainty in an uncertain world. *Oecologia*, 167:587-597, doi: 10.1007/s00442-011-2106-x
- J089. Jung, M., M. Reichstein, H.A. Margolis, A. Cescatti, **A.D. Richardson**, M.A. Arain, A. Arneth, C. Bernhofer, D. Bonal, J. Chen, D. Gianelle, N. Gobron, G. Kiely, W. Kutsch, G. Lasslop, B.E. Law, A. Lindroth, L. Merbold, L. Montagnani, E.J. Moors, D. Papale, M. Sottocornola, F. Vaccari, and C. Williams. 2011. Global patterns of land-atmosphere fluxes of carbon dioxide, latent heat, and sensible heat derived from eddy covariance, satellite, and meteorological observations. *Journal of Geophysical Research—Biogeosciences*, 116: Art. No. G00J07, doi: 10.1029/2010JG001566
- J088. Féret, J.-B., C. François, A. Gitelson, G.P. Asner, K.M. Barry, C. Panigada, **A.D. Richardson**, and S. Jacquemoud. 2011. Optimizing spectral indices and chemometric analysis of leaf chemical properties using radiative transfer modeling. *Remote Sensing of Environment*, 115:2742-2750, doi: 10.1016/j.rse.2011.06.016
- J087. Migliavacca, M., M. Galvagno, E. Cremonese, M. Rossini, M. Meroni, O. Sonnentag, S. Cogliati, G. Manca, F. Diotri, L. Busetto, A. Cescatti, R. Colombo, F. Fava, U. Morra di Cella, E. Pari, C. Siniscalco, and **A.D. Richardson**. 2011. Using digital repeat photography and eddy covariance data to model grassland phenology and photosynthetic CO₂ uptake. *Agricultural and Forest Meteorology*, 151: 1325-1337, doi: 10.1016/j.agrformet.2011.05.012
- J086. Bartlett, M.K.*, S.V. Ollinger, D.Y. Hollinger, H.F. Wicklein, and **A.D. Richardson**. 2011. Canopy-scale relationships between foliar nitrogen and albedo are not observed in leaf reflectance and transmittance within temperate deciduous tree species. *Botany*, 89: 491-497, doi: 10.1139/b11-037
- J085. **Richardson, A.D.**, D.B. Dail, and D.Y. Hollinger. 2011. Leaf area index uncertainty estimates for model-data fusion applications. *Agricultural and Forest Meteorology*, 151: 1287-1292, doi: 10.1016/j.agrformet.2011.05.009
- J084. Zhao, F., X. Yang, M.A. Schull, M.O. Roman-Colon, T. Yao, Z. Wang, Q. Zhang, D.L.B. Jupp, J.L. Lovell, D.S. Culvenor, G.J. Newnham, **A.D. Richardson**, W. Ni-Meister, C.L. Schaaf, C.E. Woodcock, and A.H. Strahler. 2011. Measuring effective leaf area index, foliage profile, and stand height in New England forest stands using a full-waveform ground-based lidar. *Remote Sensing of Environment*, 115: 2954-2964, doi:10.1016/j.rse.2010.08.030
- J083. Mahecha, M.D., M. Reichstein, N. Carvalhais, G. Lasslop, H. Lange, S.I. Seneviratne, R. Vargas, C. Ammann, M.A. Arain, A. Cescatti, I.A. Janssens, M. Migliavacca, L. Montagnani, and **A.D. Richardson**. 2011. Response to comment on “Global convergence in the temperature sensitivity of respiration at ecosystem level”. *Science*, 331: 1265, doi: 10.1126/science.1197033
- J082. Xiao, J., Q. Zhuang, B.E. Law, D.D. Baldocchi, J. Chen, **A.D. Richardson**, J.M. Melillo, K.J. Davis, D.Y. Hollinger, S. Wharton, R. Oren, A. Noormets, M.L. Fischer, S.B. Verma, D.R. Cook, G. Sun, S. McNulty, S.C. Wofsy, P.V. Bolstad, S.P. Burns, P.S. Curtis, B.G. Drake, M. Falk, D.R. Foster, L. Gu, J.L. Hadley, G.G. Katul, M. Litvak, S. Ma, T.A. Martin, R. Matamala, T.P. Meyers, R.K. Monson, J.W. Munger, W.C. Oechel, K.T. Paw U, H.P. Schmid, R.L. Scott, G. Starr, A.E. Suyker, and M.S. Torn. 2011. Assessing net ecosystem carbon exchange of U.S. terrestrial ecosystems by integrating eddy covariance flux measurements and satellite observations. *Agricultural and Forest Meteorology*, 151: 60-69, doi:10.1016/j.agrformet.2010.09.002
- J081. Groenendijk, M., A.J. Dolman, M.K. van der Molen, A. Arneth, N. Delapierre, J.H.C. Gash, R. Leuning, A. Lindroth, **A.D. Richardson**, H. Verbeeck, and G. Wohlfahrt. 2011. Assessing

- parameter variability in a photosynthesis model within and between plant functional types using global FLUXNET eddy covariance data. *Agricultural and Forest Meteorology*, 151: 22-38, doi:10.1016/j.agrformet.2010.08.013
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- J017. **Richardson, A.D.**, X. Lee, and A.J. Friedland. 2004. Microclimatology of treeline spruce-fir forests in mountains of the northeastern United States. *Agricultural and Forest Meteorology* 125: 53-66.
- J016. **Richardson, A.D.** 2004. Foliar chemistry of balsam fir and red spruce in relation to elevation and the canopy light gradient in the mountains of the northeastern United States. *Plant and Soil* 260: 291-299.
- J015. **Richardson, A.D.**, M. Aikens, G.P. Berlyn, P. Marshall. 2004. Drought stress and paper birch (*Betula papyrifera*) seedlings: Effects of an organic biostimulant on plant health and stress tolerance, and detection of stress effects with instrument-based, noninvasive methods. *Journal of Arboriculture* 30: 52-61.
- J014. **Richardson, A.D.** J.B. Reeves, and T.G. Gregoire. 2004. Multivariate analyses of visible/near infrared (VIS/NIR) absorbance spectra reveal underlying spectral differences among dried, ground conifer needle samples from different growth environments. *New Phytologist* 161: 291-301.
- J013. **Richardson, A.D.**, C. Bealle Statland, and T.G. Gregoire. 2003. Root biomass distribution under three cover types in a patchy *Pseudotsuga menziesii* forest in western Canada. *Annals of Forest Science* 60: 469-474.
- J012. **Richardson, A.D.**, E.G. Denny, T.G. Siccoma, and X. Lee. 2003. Evidence for a rising cloud ceiling in eastern North America. *Journal of Climate* 16: 2093-2098.
- J011. **Richardson, A.D.**, G.P. Berlyn, and S.P. Duigan. 2003. Reflectance of Alaskan black spruce and white spruce foliage in relation to elevation and latitude. *Tree Physiology* 23: 537-544.
- J010. **Richardson, A.D.** and H. zu Dohna. 2003. Predicting root biomass from branching patterns of Douglas-fir root systems. *Oikos* 100: 96-104
- J009. **Richardson, A.D.** and G.P. Berlyn. 2002. Changes in foliar spectral reflectance and chlorophyll fluorescence of four temperate species following branch cutting. *Tree Physiology* 22: 499-506.
- J008. **Richardson, A.D.**, S.P. Duigan, and G.P. Berlyn. 2002. An evaluation of non-invasive methods to estimate foliar chlorophyll content. *New Phytologist* 153: 185-194.
- J007. **Richardson, A.D.** and G.P. Berlyn. 2002. Spectral reflectance and photosynthetic properties of *Betula papyrifera* (Betulaceae) leaves along an elevational gradient on Mt. Mansfield, Vermont, USA. *American Journal of Botany* 89: 88-94.

- J006. **Richardson, A.D.**, P.M.S. Ashton, G.P. Berlyn, M.E. McGroddy, and I.R. Cameron. 2001. Within-crown foliar plasticity of western hemlock, *Tsuga heterophylla*, in relation to stand age. *Annals of Botany* 88: 1007-1015.
- J005. **Richardson, A.D.**, E.G. Denny, J. Forbush, T.G. Siccama, and K. Hunter. 2001. Differential aluminum and calcium concentrations in the tissues of ten *Cornus* species. *Journal of the Torrey Botanical Society* 128: 120-127.
- J004. **Richardson, A.D.**, G.P. Berlyn, and T.G. Gregoire. 2001. Spectral reflectance of *Picea rubens* (Pinaceae) and *Abies balsamea* (Pinaceae) needles along an elevational gradient, Mt. Moosilauke, New Hampshire. *American Journal of Botany* 88: 667-676.
- J003. **Richardson, A.** 2000. Coarse root elongation rate estimates for interior Douglas-fir. *Tree Physiology* 20: 825-829.
- J002. **Richardson, A.D.** and T.G. Siccama. 2000. Are soils like sponges? *Journal of the American Water Resources Association* 36: 913-918.
- J001. **Richardson, A.D.**, G.P. Berlyn, P.M.S. Ashton, R. Thadani, and I.R. Cameron. 2000. Foliar plasticity of hybrid spruce in relation to crown position and stand structure. *Canadian Journal of Botany* 78: 305-317.

BOOK CHAPTERS

- B007. Hanes, J., **A.D. Richardson**, and S. Klosterman. 201x. Chapter 12: Mesic temperate deciduous forest phenology. In: M.D. Schwartz (Ed.). *Phenology: An Integrative Environmental Science (2nd Edition)*. Springer, New York, in press.
- B006. **Richardson, A.D.**, S. Klosterman, and M. Toomey. 201x. Chapter 22: Near-surface sensor-derived phenology. In: M.D. Schwartz (Ed.). *Phenology: An Integrative Environmental Science (2nd Edition)*. Springer, New York, in press.
- B005. Reichstein, M., P.C. Stoy, A.R. Desai, G. Lasslop, and **A.D. Richardson**. 2012. Partitioning of net fluxes. In: M. Aubinet, T. Vesala, D. Papale, eds. *Eddy Covariance: A practical guide to measurement and data analysis*. Springer Atmospheric Sciences, pp. 263-289, doi: 10.1007/978-94-007-2351-1_9
- B004. **Richardson, A.D.**, M. Aubinet, A.G. Barr, D.Y. Hollinger, A. Ibrom, G. Lasslop, and M. Reichstein. 2012. Uncertainty quantification. In: M. Aubinet, T. Vesala, D. Papale, eds. *Eddy Covariance: A practical guide to measurement and data analysis*. Springer Atmospheric Sciences, pp. 173-209, doi: 10.1007/978-94-007-2351-1_7
- B003. **Richardson, A.D.** and J. O'Keefe. 2009. Phenological differences between understory and overstory: A case study using the long-term Harvard Forest records. In: A. Noormets, ed. *Phenology of Ecosystem Processes*. Springer Science + Business, New York. pp. 87-117.
- B002. Hadley, J.L., J. O'Keefe, J.W. Munger, D.Y. Hollinger and **A.D. Richardson**. 2009. Phenology of forest-atmosphere carbon exchange for deciduous and coniferous forests in southern and northern New England: Variation with latitude and landscape position. In: A. Noormets, ed. *Phenology of Ecosystem Processes*. Springer Science + Business, New York. pp. 119-141.
- B001. Berlyn, G.P. and **A.D. Richardson**. 2001. Wood: Its properties in relation to its use in turning, pp. 152-161, in: *Wood Turning in North America Since 1930*. Yale University Art Gallery, New Haven, CT.

OTHER PUBLICATIONS

- P004. Friberg, R., R.W. Paterson, and **A.D. Richardson**. 2011. Why is there a home bias? A case study of wine. *Journal of Wine Economics*, 6: 37-66. Previously as AAWE Working Paper no. 65. http://wine-economics.org/workingpapers/AAWE_WP65.pdf.
- P003. Williams, M., P. Stoy, **A. Richardson**, E. Tomelleri, and C. Trudinger. 2008. Combining flux and ecosystem data with land surface models: the role of FLUXNET. *FluxLetter (The Newsletter of FLUXNET)* 1(4): 9-11.

- P002. Wingate, L., **A.D. Richardson**, J.F. Weltzin, K.N. Nasahara, and J. Grace. 2008. Keeping an eye on the carbon balance: linking canopy development and net ecosystem exchange using a webcam. *FluxLetter (The Newsletter of FLUXNET)* 1(2): 14-17.
- P001. McNeil, B., E. Denny, and **A.D. Richardson**. 2008. Coordinating a Northeast Regional Phenology Network. *Bulletin of the Ecological Society of America* 89: 188-190.

INVITED LECTURES & DEPARTMENTAL SEMINARS

- National Ecological Observatory Network, Boulder CO, August 2011.
- Penn State University, Interdepartmental Graduate Program in Ecology seminar series, State College PA, March 2011.
- Max-Planck-Institut für Biogeochemie, Jena, Germany, June 2009.
- Technische Universität München, Forstwissenschaften und Ressourcenmanagement, Fachgebiet für Ökoklimatologie, Freising, Germany, May 2009.
- Massachusetts Institute of Technology, Lincoln Laboratory, Lincoln MA, March 2009.
- Marine Biological Laboratory, Ecosystems Center, Woods Hole MA, January 2009.
- Boston University, Department of Geography and Environment, Boston MA, November 2008.
- CU Boulder, Summer School on Flux Measurements, Niwot Ridge CO, July 2010, 2009, 2008.
- Harvard University, Department of Organismic and Evolutionary Biology, Cambridge MA, March 2008.
- Edinburgh University, School of GeoSciences, Edinburgh, Scotland, September 2007.
- University of Minnesota, College of Food, Agricultural and Natural Resource Sciences, April 2007.
- Woods Hole Research Center, Falmouth MA, March 2007.
- University of New Hampshire, Institute for the Study of Earth, Oceans, and Space, Durham NH, March 2007.
- Brown University, Environmental Change Initiative, Providence RI, February 2006.
- University of New Hampshire, Complex Systems Research Center, Durham NH, March 2003.

INVITED PRESENTATIONS AT NATIONAL MEETINGS

- American Geophysical Union, Fall Meeting, San Francisco CA, December 2012 (upcoming).
- American Geophysical Union, Fall Meeting, San Francisco CA, December 2011.
- Ecological Society of America, Annual Meeting, Pittsburgh PA, August 2010.
- European Geosciences Union, General Assembly, Vienna, Austria, May 2010.
- Ecological Society of America, Annual Meeting, Albuquerque NM, August 2009.
- Fluxnet-Canada/Canadian Carbon Program Annual Meeting, Calgary AB, March 2008.
- American Geophysical Union, Fall Meeting, San Francisco CA, December 2007.
- AmeriFlux Annual Science Meeting, Boulder CO, October 2007.

INVITED WORKSHOP PARTICIPATION AND PRESENTATIONS

- NOAA Climate Program Office Working Group, Boston, MA, June 2012 (oral presentation: State of the science: Ecosystem responses to climate change).
- PhenoAlp Final Meeting, Workshop on climate change, phenology and ecosystem processes from Alps to Globe, Torgnon, Italy, October 2011 (keynote lecture: Continental-scale phenological monitoring with networked digital cameras: what we are learning from PhenoCam).
- EU CARBO-Extreme Second Annual Meeting, Montpellier, France, September 2011 (oral presentation: Forecasts of phenological responses to climate change—Quantifying the uncertainties).
- FLUXNET and Remote Sensing Open Workshop: Towards Upscaling Flux Information from Towers to the Globe, Berkeley CA, June 2011 (oral presentation: Using digital cameras to monitor vegetation phenology: Insights from PhenoCam).
- NACP Third Joint Workshop (Site-level Interim Synthesis, Regional and Continental Interim Synthesis), Boulder CO, August 2010.
- First NSF FORECAST RCN Workshop, Boulder CO, July 2010.

CEOS Working Group on Calibration and Validation, Land Product Validation Subgroup, Workshop on the Validation of Satellite-based Land Surface Phenology Products, Dublin, Ireland, June 2010 (oral presentation: PhenoCam: Monitoring vegetation phenology with networked digital cameras).

NACP Second Joint Workshop (Site-level Interim Synthesis, Regional and Continental Interim Synthesis), Oak Ridge National Laboratory, Oak Ridge TN, November 2009.

MDI-BGC Workshop, Novel Data Mining Strategies for Exploring Biogeochemical Cycles and Biosphere-Atmosphere Interactions, Max-Planck-Institut für Biogeochemie, Jena, Germany, June 2009 (oral presentation: Making sense of 15,743,868,892 bytes: Why we need new approaches to extract ecologically relevant information from the FLUXNET database).

EU CARBO-Extreme IP Kick-off Meeting, Jena Germany, June 2009 (advisory board oral presentation: On the use of long-term observations for quantifying climate-biosphere interactions).

FLUXNET Asilomar Modeling Workshop, Monterey CA, February 2009.

NACP Joint Workshop (Site-level Interim Synthesis, Regional and Continental Interim Synthesis), Oak Ridge National Laboratory, Oak Ridge TN, January 2009 (oral presentation: Uncertainties in flux measurements).

2nd USA National Phenology Network RCN Meeting, Milwaukee WI, September 2008.

CarbonFusion Workshop on Improving Land Surface Models with FLUXNET, Edinburgh, Scotland, June 2008 (oral presentation: Errors and uncertainties in modeling and measuring surface-atmosphere exchanges).

CarbonFusion REFLEX Team Meeting, Edinburgh, Scotland, June 2008.

NSRC Workshop on Coordinating a Northeastern Phenology Network, Durham NH, November 2007 (oral presentation: Instrument-based approaches to monitoring forest canopy phenology).

NSF Workshop on Data-Model Assimilation in Ecology: Techniques and Applications, Norman OK, October 2007 (oral presentations: Uncertainty in eddy covariance measurements, Data-model fusion for AmeriFlux).

TERACC Workshop on Analysis and Modeling of Automated Soil Respiration Measurements, Durham NH, September 2007 (oral presentation: Merging soil respiration and total ecosystem respiration measurements with data assimilation).

First USA National Phenology Network RCN Meeting, Milwaukee WI, August 2007.

FLUXNET–TCO La Thuile Synthesis Workshop, La Thuile, Italy, February 2007.

EU CarboEurope IP Workshop on Gap Filling of Eddy Flux Data, Jena, Germany, September 2006 (oral presentation: Why gap filling isn't always easy).

PUBLIC LECTURES AND OUTREACH

Contributed to Botany Library/Harvard University Herbaria exhibit in NW Labs Building, tentative title: “The Woody Collections of the Harvard University Herbaria” (On display beginning November 2012).

Public Lecture, Harvard University, Museum of Natural History, Cambridge MA, November 2011.

Contributed to Harvard Museum of Natural History exhibit, “New England Forests” (Opened Spring 2011).

Public Lecture, Concord Land Conservation Trust, Concord MA, April 2011.

Podcast, Ecological Society of America, Beyond the Frontier: “In Ecology, Timing is Everything” (June 9, 2009); available at <http://www.esa.org/podcast/>.

SERVICE

Harvard committees:

Faculty Advisory Committee for Lab Sustainability (nominated to serve)

Standing Committee on the Concentration in Environmental Science and Public Policy (2012–present)

Hoopes Prize Committee for the Natural Sciences (2011, 2012)

Harvard University Center for the Environment (HUCE) Biodiversity and Global Change Speaker Series, Planning committee (2010–2011)

External committees:

National Ecological Observatory Network (NEON) Fundamental Instrument Unit (FIU) Advisory Board (2009–present)

NSF “Forecasts Of Resource and Environmental Changes: data Assimilation Science and Technology (FORECAST)” RCN, Steering Committee (2009–2012)

EU CARBO-Extreme Project (“The terrestrial Carbon cycle under Climate Variability and Extremes: a Pan European Synthesis”), Advisory Board (2009–present)

North American Carbon Program (NACP), Model-data comparison/Interim synthesis Coordinating Group (2007–2012)

University of New Hampshire, Faculty Search (Research Assistant Professor) Committee (2009)

American Geophysical Union, Fall Meeting Session Co-Convener (Nonstructural Carbon in Plants: Observations, Modeling and Theory, 2012; Interacting Biogeochemical Cycles: Linking Carbon, Water, and Nutrient Fluxes From Organisms to Globe, 2011, 2010; Carbon and water cycles: interpreting and assimilating from leaf and soil column to globe, 2009)

European Geosciences Union, General Assembly Session Co-Convener (BG2.5, Interacting Biogeochemical Cycles: Linking Carbon, Water and Nutrient Fluxes from Organisms to Globe, 2011; BG2.3 Biosphere-atmosphere interactions: Trends and spatio-temporal variability in biogeochemical surface fluxes, 2010; BG2.9 Biosphere-Atmosphere interactions: Carbon and water cycles at multiple spatial and temporal scales, 2010; BG2.4 Inter-annual variability of terrestrial ecosystem CO₂, H₂O and energy exchange, 2009).

Northeast Regional Phenology Network (NE-RPN), Organizing committee (2007–2008)

TERACC Workshop on analysis and modeling of automated soil respiration measurements, Advisory committee (2007)

NERC Climate Variability and Change study group, Steering committee (2005–2009)

Hubbard Brook LTER, Committee of Scientists (2004–present; organized a one-day meeting: “Data-model fusion: What is it and why do we need it?”, April 2008)

Reviewing and editorial:

Agricultural and Forest Meteorology, Editorial Board (2008–present)

Global Change Biology, Editorial Review Board (2007–present)

Ad-hoc handling editor: Ecology (2010), Ecological Applications (2012)

Manuscripts reviewed for: Agricultural and Forest Meteorology (2003, 2005, 2006 3x, 2007 3x, 2008 3x, 2009 2x, 2010 5x, 2011 3x, 2012 2x), Agronomy Journal (2003), American Journal of Botany (2005), Annals of Botany (2007), Applied Mathematics and Computation (2008), Biogeosciences Discussions (2010, 2009), BioScience (2007), Canadian Journal of Botany (2002), Canadian Journal of Forest Research (2003, 2004), Climate Research (2012 2x), Ecological Applications (2007, 2010), Forest Ecology and Management (2006), Forest Science (2000, 2002), Geophysical Research Letters (2009), Global Biogeochemical Cycles (2007), Global Change Biology (2004, 2005, 2006 2x, 2007 4x, 2008 4x, 2009 4x, 2011 2x, 2012 2x), Journal of Climate (2003), Journal of Atmospheric and Oceanographic Technology (2006), Journal of Geophysical Research–Atmospheres (2006, 2007 2x), Journal of Geophysical Research–Biogeosciences (2007, 2008 3x, 2010), Nature (2010 2x, 2012 4x), Nature Climate Change (2012), New Phytologist (2002, 2004, 2006, 2008, 2012), Oecologia (2008 2x, 2009 2x), Planta (2006), Remote Sensing of Environment (2004 2x, 2009), Scandinavian Journal of Forest Research (2005), Tellus Series B (2005), Tree Physiology (2002, 2003, 2005, 2006, 2007, 2008), Trees: Structure and Function (2005).

Grant proposals reviewed for: NOAA (2011 Climate Program Office–Global Carbon Cycle) National Science Foundation (2004 2x, Integrative Biology; 2008, 2009, 2010, 2012 Ecosystem Studies; 2009, Hydrologic Sciences), NASA (2009, Terrestrial Ecology) Maine Agricultural and Forest Experiment Station (2006), ETH Zurich Research Commission (2008), Fonds Wetenschappelijk Onderzoek/Research Foundation Flanders (2010), M. J. Murdock Charitable Trust (2011), PSC-City University of New York (2008).

Book proposals reviewed for: Sinauer Associates (2007).

Other service:

Princeton University, Alumni Schools Committee interviewer (2003–2009)

Princeton University, Class of 1992 Annual Giving campaign volunteer (2006–2009)

GRADUATE AND POSTDOCTORAL ADVISORS AND ADVISEES

Graduate advisors: G.P. Berlyn, P.M.S. Ashton, X. Lee (Yale University), A.J. Friedland (Dartmouth College).

Postdoctoral sponsors: J.D. Aber (UNH), D.Y. Hollinger (USDA Forest Service).

Advisees:

Postdocs: Trevor Keenan (2010–); Michael Toomey (2011–); Julie Shoemaker (2012–); Youngryel Ryu (2010–2011, now assistant professor at Seoul National University), Oliver Sonnentag (2010–2011; now assistant professor at Université de Montréal).

Graduate Students: Current: Tom Powell (Harvard University, PhD candidate; committee member); Steve Klosterman (Harvard University, PhD student; major advisor); Anne Kakouridis (Harvard University, PhD student; major advisor); Eli Melaas (Boston University, PhD student; committee member). Previous: Katie Berger (University of New Hampshire, M.S. 2008; committee member); Hella Ahrends (ETH Zurich, PhD 2010; external examiner); Manish Verma (Boston University, PhD 2012; committee member).

Undergraduate Theses (Harvard College): Current (2012–2013): Anika Petach, Min Lee, Fiona Jevon.

Undergraduate REU Students and Summer Interns: 2009: Megan Bartlett (Harvard College, 2009; now PhD student at UCLA); 2010: Adam Young (SUNY ESF, 2011; now PhD student at University of Idaho), Andrea Garcia (Humboldt State, 2011), Cory Teshera-Sterne (Mt Holyoke, 2010); 2011: Bridget Darby (Boston University, 2013), Libby Felts (Harvard College, 2014), Isaac Lavine (Lafayette College, 2014), Lakeitha Mitchell (Lincoln University, 2012), Rachel Norman (UNC Chapel Hill, 2012); 2012: Min Lee (Harvard College, 2013), Dmitri Ilushin (Harvard College, 2014), Hannah Skolnick (Columbia University, 2015), Sascha Perry (Lincoln University, 2013).

REFERENCES

Dr. David Y. Hollinger, USDA Forest Service (davidh@hypatia.unh.edu, 603 868 7673)

Professor John D. Aber, University of New Hampshire (john.aber@unh.edu, 603 862 3045)

Professor Xuhui Lee, Yale University (xuhui.lee@yale.edu, 203 432 6271)

Professor Graeme P. Berlyn, Yale University (graeme.berlyn@yale.edu, 203 432 5142)