Curriculum vitae
Peter E. Thornton

Contact information:
Address: Oak Ridge National Laboratory
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Education:

Ph.D., 1998. ***The University of Montana***, Missoula, MT
Advisor and Department: Steven W. Running, School of Forestry
Research Focus: Terrestrial biogeochemistry, biometeorology, and visible, near-infrared, and thermal-infrared remote sensing.
Dissertation: *Regional ecosystem simulation: combining surface- and satellite-based observations to study linkages between terrestrial energy and mass budgets*.

M.A., 1992. ***The Johns Hopkins University***, Baltimore, MD
Advisor and Department: Grace S. Brush, Geography and Environmental Engineering
Research Focus: Paleoecology, Paleoclimatology, and Plant Geography

B.A., 1990. ***The Johns Hopkins University***, Baltimore, MD
Major: Biomedical Engineering
Focus: Mathematical modeling of physiological feedback systems

Employment:

August 2012 – present: **Group Leader**, Terrestrial Systems Modeling Group, Environmental Sciences Division, Oak Ridge National Laboratory, Oak Ridge, TN
November 2009 – present: **Lead**, Terrestrial Ecosystem and Carbon Cycle Science, Climate Change Science Institute, Oak Ridge National Laboratory, Oak Ridge, TN
August 2008 – present: **Senior Research Scientist**, Environmental Sciences Division, Oak Ridge National Laboratory, Oak Ridge, TN.
August 2001 – August 2008: **Scientist**, Climate and Global Dynamics Division, National Center for Atmospheric Research, Boulder, CO.
September 1999 – July 2001: **Research Associate**, The University of Montana, School of Forestry, Numerical Terradynamic Simulation Group.
September 1998 – August 1999: **Postdoctoral Fellow**, The University of Montana, School of Forestry, Numerical Terradynamic Simulation Group.
August 1992 - August 1998: **Graduate research assistant**, The University of Montana, School of Forestry, Numerical Terradynamic Simulation Group
August 1990 - August 1992: **Graduate research assistant**, The Johns Hopkins University, Department of Geography and Environmental Engineering

August 1986 - August 1990: **Undergraduate research assistant**, The Johns Hopkins University, Department of Biomedical Engineering

Awards and Honors:
Community Climate System Model Distinguished Achievement Award (as a member of the Land Model Working Group), 2008.
NASA Fellowship in Global Change Research, 1993-1997.
National Merit Scholar, 1986-1990.

Current Projects:
Co-I (modeling lead)**:** Next Generation Ecosystem Experiments (NGEE Arctic). PI: Stan Wulschleger, ORNL. DOE Office of Science: $8M per year.
Co-PI (with Paul Hanson)**:** ORNL Climate Change Program: Terrestrial Ecosystem Science SFA (Scientific Focus Area). DOE Office of Science: $8M per year.
PI: Strengthening the coupling between Earth System Models and Integrated Assessment Models. DOE Office of Science: $640K per year. (Institutional PI for multi-institution project, totaling $2.4M per year).
PI: Quantification and reduction of critical uncertainties associated with carbon cycle – climate system feedbacks. DOE Office of Science: $1M per year. (Overall PI for multi-institution project).
Co-I: Characterization and Modeling of Permafrost Microbial Community Diversity and Metabolism during Simulated Global Warming. ORNL Lab-Directed R&D Program: $400K per year.
Co-I: Modeling and Synthesis Thematic Data Center (MAST-DC) for the North American Carbon Program. NASA, Terrestrial Ecology Program: $500K per year.
Co-I: Climate Science for a Sustainable Energy Future. DOE Office of Science: $1.2M per year. (Crosscutting PI for Land Model component of multi-institutional project, totaling $5M per year in FY 2011).

Recently Completed Projects:
PI: Prognostic land use and land cover change for a coupled climate-biogeochemistry model. ORNL LDRD: $780,000 (2009-2011).
Co-I: Collaborative research: Fire at the intersection of global carbon and water cycles. PI: Jim Randerson, UC Irvine. NSF: $653K.

Peer-Reviewed Publications (principle authorship): 11
Thornton, P. E., Doney, S. C., Lindsay, K., Moore, J. K., Mahowald, N., Randerson, J. T., Fung, I., Lamarque, J. F., Feddema, J. J., and Lee, Y. H., **2009**. Carbon-nitrogen interactions regulate climate-carbon cycle feedbacks: results from an atmosphere-ocean general circulation model, Biogeosciences, 6, 2099-2120.
Thornton, P. E., Doney, S. C., Lindsay, K., Moore, J. K., Mahowald, N., Randerson, J. T., Fung, I., Lamarque, J. F., Feddema, J. J., and Lee, Y. H., **2009**. Carbon-nitrogen interactions regulate climate-carbon cycle feedbacks: results from an atmosphere-ocean general circulation model, Biogeosciences Discuss., 6, 3303-3354.

Thornton, P.E., Lamarque, J.-F., Rosenbloom, N.A. and Mahowald, N.M., **2007**. Influence of carbon-nitrogen cycle coupling on land model response to CO_2 fertilization and climate variability. Global Biogeochemical Cycles, 21(4): GB4018.

Thornton, P. E., and N. E. Zimmermann, **2007**. An improved canopy integration scheme for a land surface model with prognostic canopy structure, *Journal of Climate*, *20*, 3902-3923.

Thornton, P.E., R.B. Cook, B.H. Braswell, B.E. Law, W.M. Post, H.H. Shugart, B.T. Rhyne, L.A. Hook, **2005**. Archiving numerical models of biogeochemical dynamics. *Eos - Transactions of the American Geophysical Union* 86 (44): 431-432.

Thornton, P.E., N. Rosenbloom, **2005**. Ecosystem model spin-up: estimating steady state conditions in a coupled terrestrial carbon and nitrogen cycle model. *Ecological Modeling* 189 (1/2): 25-48.

Thornton, P.E., B.E. Law, H.L. Gholz, K.L. Clark, E. Falge, D.S. Ellsworth, A.H. Goldstein, R.K. Monson, D. Hollinger, M. Falk, J. Chen, J.P. Sparks, **2002**. Modeling and measuring the effects of disturbance history and climate on carbon and water budgets in evergreen needleleaf forests. *Agricultural and Forest Meteorology* 113: 185-222.

Thornton, P.E., H. Hasenauer, and M.A. White, **2000**. Simultaneous estimation of daily solar radiation and humidity from observed temperature and precipitation: an application over complex terrain in Austria. *Agricultural and Forest Meteorology,* 104: 255-271.

Thornton, P.E., and S.W. Running, **1999**. An improved algorithm for estimating incident daily solar radiation from measurements of temperature, humidity, and precipitation. *Agricultural and Forest Meteorology*, 93: 211-228.

Thornton, P.E., S.W. Running, and M.A. White, **1997**. Generating surfaces of daily meteorological variables over large regions of complex terrain. *Journal of Hydrology*, 190: 214-251.

Thornton, P.E., and S.W. Running, **1996**. Generating daily surfaces of temperature and precipitation over complex topography. Pp. 93-98, in *GIS and Environmental Modeling: Progress and Research Issues*, M.F. Goodchild, L.T. Steyaert, B.O. Parks, C. Johnston, D. Maidment, M. Crane, and S. Glendinning, Eds. GIS World Books, Ft. Collins, CO.

Peer-Reviewed Publications (co-authorship): 62

Hudiburg, T. W., B. E. Law and P. E. Thornton **(submitted)**. Evaluation and improvement of the Community Land Model (CLM4.0) in Pacific Northwest forests. *Biogeosciences*.

Jones, A. D., W.D. Collins, J. Edmonds, M.S.Torn, A.C. Janetos, K. Calvin, A. Thomson, L. Chini, J. Mao, X. Shi, P. Thornton, G.C. Hurtt, M. Wise **(submitted)**. Greenhouse gas policy influences climate via direct effects of land-use change. *J. Climate.*

Edmonds J., A.D. Jones, A. Janetos, P. Thornton, B. Bond-Lamberty, K. Calvin, L. Chini, G. Hurtt, W. Collins, J. Mao, X. Shi, A. Thomson, M. Wise, M. Torn **(submitted)**. Land-use policy complicates radiative forcing and the IPCC climate assessment process. *Nature.*

Keppel-Aleks, G., J.T. Randerson, K. Lindsay, B.B. Stephens, J.K. Moore, S.C. Doney, P.E. Thornton, N.M. Mahowald, F.H. Hoffman, C. Sweeney, P.P. Tans, P.O.

Wennberg, S.C. Wofsy **(submitted)**. Atmospheric carbon dioxide variability in the Community Earth System Model: Evaluation and transient dynamics during the 20th and 21st centuries. *J. Climate*.

Lindsay, K., G. B. Bonan, S. C. Doney, F. M. Hoffman, D. M. Lawrence, M. C. Long, N. M. Mahowald, J. K. Moore, J. T. Randerson and P. E. Thornton **(submitted)**. Preindustrial control and 20th century carbon cycle experiments with the Earth system model CESM1-(BGC). *Journal of Climate*

Xu, X., P. E. Thornton and W. M. Post **(in review)**. A global analysis of soil microbial biomass carbon, nitrogen, and phosphorus in terrestrial ecosystems. *Global Ecology and Biogeography*

Scheafer, K., C. Schwalm, and 47 other authors, including P.E. Thornton, **(in review)**. A model-data comparison of gross primary productivity: results from the North American Carbon Program Site Synthesis. *JGR-Biogeosciences*.

Rothenberg, D., N. Mahowald, et al., **2012**. Volcano impacts on climate and biogeochemistry in a coupled carbon-climate model*. Earth System Dynamics Discussions* 3: 279-323.

Mao, J., P. E. Thornton, X. Shi, M. Zhao and W. M. Post, **2012**. Remote sensing evaluation of CLM4 GPP for the period 2000-09. *Journal of Climate* 25: 5327-5342.

Levis, S., G. B. Bonan, E. Kluzek, P. E. Thornton, A. Jones, W. J. Sacks and C. J. Kucharik, **2012**. Interactive crop management in the Community Earth System Model (CESM1): Seasonal influences on land-atmosphere fluxes. *Journal of Climate* 25: 4839-4859.

Lawrence, P. J., J. J. Feddema, G. B. Bonan, G. A. Meehl, B. C. O'Neill, K. W. Oleson, S. Levis, D. M. Lawrence, E. Kluzek, K. Lindsay and P. E. Thornton, **2012**. Simulating the biogeochemical and biogeophysical impacts of transient land cover change and wood harvest in the Community Climate System Model (CCSM4) from 1850 to 2100. *Journal of Climate*, **25**: 3071-3095, doi: http://dx.doi.org/10.1175/JCLI-D-11-00256.1.

Bauerle, W. L., R. Oren, D. A. Way, S. S. Qian, P. C. Stoy, P. E. Thornton, J. D. Bowden, F. M. Hoffman and R. F. Reynolds, **2012**. Photoperiodic regulation of the seasonal pattern of photosynthetic capacity and the implications for carbon cycling. *Proceedings of the National Academy of Sciences* 109: 8612-8617, DOI: 10.1073/pnas.1119131109

Mao, J., X. Shi, P. E. Thornton, S. Piao and X. Wang, **2012**. Causes of spring vegetation growth trends in the northern mid-high latitudes from 1982 to 2004. *Environmental Research Letters* **7**(104010): 1-7 DOI: 10.1088/1748-9326/7/1/014010.

Steed, C. A., G. Shipman, P. Thornton, D. Ricciuto, D. Erickson and M. Branstetter **2012**. Practical Application of Parallel Coordinates for Climate Model Analysis. *Procedia Computer Science* 9(0): 877-886 DOI: 10.1016/j.procs.2012.04.094

Huntzinger, D. N., W. M. Post, Y. Wei, A. M. Michalak, T. O. West, A. R. Jacobson, I. T. Baker, J. M. Chen, K. J. Davis, D. J. Hayes, F. M. Hoffman, A. K. Jain, S. Liu, A. D. McGuire, R. P. Neilson, C. Potter, B. Poulter, D. Price, B. M. Raczka, H. Q. Tian, P. Thornton, E. Tomelleri, N. Viovy, J. Xiao, W. Yuan, N. Zeng, M. Zhao and R. Cook, **2012**. North American Carbon Project (NACP) regional interim synthesis: Terrestrial biospheric model intercomparison. *Ecological Modelling* **232**: 144-157 DOI: http://dx.doi.org/10.1016/j.ecolmodel.2012.02.004.

Edburg, S. L., J. A. Hicke, D. M. Lawrence and P. E. Thornton, **2011**. Simulating coupled carbon and nitrogen dynamics following bark beetle outbreaks. *Journal of Geophysical Research - Biogeosciences* **116**(G04033): 15 DOI: 10.1029/2011JG001786

Warren, J. M., C. M. Iversen, C. T. Garten, Jr., R. J. Norby, J. Childs, D. Brice, R. M. Evans, L. Gu, P. E. Thornton and D. J. Weston, **2011**. Timing and magnitude of C partitioning through a young loblolly pine (*Pinus taeda* L.) stand using ^{13}C labeling and shade treatments. *Tree Physiology* DOI: 10.1093/treephys/tpr129.

Hurtt, G. C., L. P. Chini, S. Frolking, R. Betts, J. Feddema, G. Fischer, J. P. Fisk, K. Hibbard, R. A. Houghton, A. Janetos, C. Jones, G. Kindermann, T. Kinoshita, K. Klein Goldewijk, K. Riahi, E. Svevliakova, S. Smith, E. Stehfest, A. Thomson, P. Thornton, D. P. van Vuuren and Y. Wang, **2011**. "Harmonization of land-use scenarios for the period 1500-2100: 600 years of global gridded annual land-use transitions, wood harvest, and resulting secondary lands." *Climatic Change,* DOI: 10.1007/s10584-011-0153-2

Turner, D. P., W. D. Ritts, Z. Yang, R. E. Kennedy, W. B. Cohen, M. V. Duane, P. E. Thornton and B. E. Law, **2011**. Decadal trends in net ecosystem production and net ecosystem carbon balance for a regional socioecological system. *Forest Ecology and Management*, in press.

Kattge, J., et al. (134 authors, including Thornton, P.E.), **2011**. TRY - a global database of plant traits, *Global Change Biology*, DOI: 10.1111/j.1365-2486.2011.02451.x.

Shi, X., Mao, J., Thornton, P.E., Hoffman, F.M., Post, W.M., **2011**. The impact of climate, CO_2, nitrogen deposition and land use change on simulated contemporary global river flow. *Geophysical Research Letters*, **38**(8): L08704, doi: 10.1029/2011gl046773.

Mahowald, N., Lindsay, K., Rothenberg, D., Doney, S.C., Moore, J.K., Thornton, P., Randerson, J.T., Jones, C.D., **2011**. Desert dust and anthropogenic aerosol interactions in the Community Climate System Model coupled-carbon-climate model. *Biogeosciences*, **8**(2): 387-414, doi: 10.5194/bg-8-387-2011.

Lawrence, D.M., Oleson, K.W. Flanner, M.G., Thornton, P.E., Swenson, S.C., Lawrence, P.J., Zeng, X., Yang, Z.-L., Levis, S., Sakaguchi, K., Bonan, G.B., Slater, A.G., **2011**. Parameterization improvements and functional and structural advances in Version 4 of the Community Land Model. *Journal of Advances in Modeling Earth Systems,* **3**, doi: 10.1029/2011MS000045.

Warren, J. M., E. Pötzelsberger, S. D. Wullschleger, P. E. Thornton, H. Hasenauer and R. J. Norby, **2011**. Ecohydrologic impact of reduced stomatal conductance in forests exposed to elevated CO_2. *Ecohydrology* **4**: 196-210.

Mahowald, N. M., S. Kloster, S. Engelstaedter, J. K. Moore, S. Mukhopadhyay, J. R. McConnell, S. Albani, S. C. Doney, A. Bhattacharya, M. A. J. Curran, M. G. Flanner, F. M. Hoffman, D. M. Lawrence, K. Lindsay, P. A. Mayewski, J. Neff, D. Rothenberg, E. Thomas, P. E. Thornton and C. S. Zender, **2010**. Observed 20th century desert dust variability: impact on climate and biogeochemistry. *Atmos. Chem. Phys.* **10**(22): 10875-10893.

Mahowald, N., Lindsay, K., Rothenberg, D., Doney, S.C., Moore, J.K., Thornton, PE., Randerson, J.T., Jones, C.D., **2010**. Desert dust and anthropogenic aerosol interactions in the Community Climate System Model coupled-carbon-climate model. *Biogeosciences Discussions*, 7, 6617-6673.

Mao, J., X. Shi, L. Ma, D.P. Kaiser, Q. Li, and P.E. Thornton, **2010**. Assessment of re-analysis daily extreme temperatures with China's homogenized historical dataset during 1979-2001 using Probability Density Functions, *Journal of Climate*, 23, 6605-6623. doi: 10.1175/2010JCLI3581.1.

Mahowald, N.M., Kloster, S., Engelstaedter, S., Moore, J.K., Mukhopadhyay, S., McConnell, J.R., Albani, S., Doney, S.C., Bhattacharya, A., Curran, M.A.J., Flanner, M.G., Hoffman, F.M., Lawrence, D.M., Lindsay, K., Mayewski, P.A., Neff, J., Rothenberg, D., Thomas, E., Thornton, P.E., Zender, C.S., **2010**. Observed 20th century desert dust variability: impact on climate and biogeochemistry. *Atmospheric Chemistry and Physics Discussions*, 10, 12585-12682.

Kloster, S., Mahowald, N. M., Randerson, J. T., Thornton, P. E., Hoffman, F. M., Levis, S., Lawrence, P. J., Feddema, J. J., Oleson, K. W., and Lawrence, D. M., **2010**. Fire dynamics during the 20th century simulated by the Community Land Model, *Biogeosciences*, 7, 1877-1902, 10.5194/bg-7-1877-2010, 2010.

Oleson, K. W., Lawrence, D. M., Bonan, G. B., Flanner, M. G., Kluzek, E., Lawrence, P. J., Levis, S., Swenson, S. C., and Thornton, P. E., **2010**. Technical Description of version 4.0 of the Community Land Model (CLM), NCAR Technical Note, 257 pp.

Wang, W., Ichii, K., Hashimoto, H., Michaelis, A. R., Thornton, P. E., Law, B. E., and Nemani, R. R., **2009**. A hierarchical analysis of terrestrial ecosystem model Biome-BGC: equilibrium analysis and model calibration, *Ecological Modelling*, 220(17): 2009-2032.

Randerson, J. T., Hoffman, F. M., Thornton, P. E., Mahowald, N. M., Lindsay, K., Lee, Y.-H., Nevison, C. D., Doney, S. C., Bonan, G., Stöckli, R., Covey, C., Running, S. W., and Fung, I. Y., **2009**. Systematic assessment of terrestrial biogeochemistry in coupled climate-carbon models, Global Change Biology, 15, 2462-2484, 10.1111/j.1365-2486.2009.01912.x.

Stöckli, R., Rutishauser, T., Dragoni, D., O'Keefe, J., Thornton, P.E., Jolly, M., Lu, L., Denning, A.S., **2008**. Remote sensing data assimilation for a prognostic phenology model. *Journal of Geophysical Research*, 113, G04021, doi:10.1029/2008JG000781.

Stöckli, R, Lawrence, D.M., Niu, G.-Y., Oleson, K.W., Thornton, P.E., Yang, Z.-L., Bonan, G.B., Denning, A.S., Running, S.W., **2008**. Use of FLUXNET in the Community Land Model development. *Journal of Geophysical Research*, 113, G01025, doi:10.1029/2007JG000562.

Oleson, K.W, Niu, G.-Y., Yang, Z.-L., Lawrence, D.M., Thornton, P.E., Lawrence, P.J., Stöckli, R., Dickinson, R.E., Bonan, G.B., Levis, S., Dai, A., Qian, T., **2008**. Improvements to the Community Land Model and their impact on the hydrological cycle. *Journal of Geophysical Research*, 113, G01021, doi:10.1029/2007JG000563.

Lawrence, D.M., P.E. Thornton, K.W. Oleson, G.B. Bonan, **2007**. The partitioning of evapotranspiration into transpiration, soil evaporation, and canopy evaporation in a GCM. *Journal of Hydrometeorology*, 8(4): 862-880.

Turner, D.P., W.D. Ritts, J. Styles, Z. Yang, W.B. Cohen, B.E. Law, P.E. Thornton, **2006**. A diagnostic carbon flux model to monitor the effects of disturbance and interannual variation in climate on regional NEP. *Tellus*, 58B:476-490

Del Grosso, S.J., W.J. Parton, A.R. Mosier, M.K. Walsh, D.S. Ojima, P.E. Thornton, **2006**. DAYCENT national-scale simulations of nitrous oxide emissions from cropped soils in the United States. *Journal of Environmental Quality*, 35: 1451-1460.

Dickinson, R.E., K.W. Oleson, G.B. Bonan, F.M. Hoffman, P.E. Thornton, M. Vertenstein, Z.-L. Yang, X. Zeng, **2006**. The Community Land Model and its climate statistics as a component of the Community Climate System Model. *Journal of Climate*. 19:2302-2324.

Zimmermann, N.E., H. Lischke, P.E. Thornton, **2006**. Up-scaling of biological properties and mechanisms to the landscape level. Chapter 5 in "A changing world: challenges for landscape research", F. Kienast, S. Ghosh, O. Wildi, editors. Landscape Series, Vol. 8. Springer.

Lamarque, J.-F., J. Kiehl, G. Brasseur, T. Butler, P. Cameron-Smith, W.D. Collins, W.J. Collins, C. Granier, D. Hauglustaine, P. Hess, E. Holland, L. Horowitz, M. Lawrence, D. McKenna, P. Merilees, M. Prather, P. Rasch, D. Rotman, D. Shindell and P. Thornton, **2005**. Assessing future nitrogen deposition and carbon cycle feedback using a multi-model approach: Analysis of nitrogen deposition. *Journal of Geophysical Research* 110: D19303.

Pietsch, S.A., H. Hasenauer, and P.E. Thornton, **2005**. BGC-model parameters for tree species growing in central European forests. *Forest Ecology and Management* 211: 264-295.

Bond-Lamberty, B., S.T. Gower, D. Ahl, and P.E. Thornton, **2005**. A reimplementation of the Biome-BGC model supporting multiple interacting vegetation types. *Tree Physiology,* 25: 413-424.

Hanson, P.J., J.S. Amthor, S.D. Wullschleger, K.B. Wilson, R.F. Grant, A. Hartley, D. Hui, E.R. Hunt Jr., D.W. Johnson, J.S. Kimball, A.W. King, Y. Luo, S.G. McNulty, G. Sun, P.E. Thornton, S. Wang, M. Williams, D.D. Baldocchi, R.M. Cushman, **2004**. Oak forest carbon and water simulations: model intercomparisons and evaluations against independent data. *Ecological Monographs*, 74(3): 443-489.

Hasenauer, H., K. Merganicova, R. Petritsch, S. Pietsch, P.E. Thornton, **2003**. Validating daily climate interpolations of complex terrain in Austria. *Agricultural and Forest Meteorology* 119: 87-107.

Churkina, G., J. Tenhunen, P.E. Thornton, E.M. Falge, J.A. Elbers, M. Erhard, T. Grünwald, A.S. Kowalski, and U. Rannik, D. Sprinz, **2003**. Analyzing the ecosystem carbon dynamics of four European coniferous forests using a biogeochemistry model. *Ecosystems* 6: 168-184.

McKenzie, D., D.W. Peterson, D.L. Peterson, P.E. Thornton, **2003**. Climatic and biophysical controls on conifer species distributions in mountain forests of Washington State, USA. *Journal of Biogeography* 30: 1093-1108.

Fujita, D., M. Ishizawa, S. Maksyutov, P.E. Thornton, T. Saeki, T. Nakazawa, **2003**. Inter-annual variability of the atmospheric carbon dioxide concentrations as simulated with global terrestrial biosphere models and an atmospheric transport model. *Tellus* 55B(2): 530-546.

Law, B.E., O.J. Sun, J. Campbell, S. VanTuyl, P.E. Thornton, **2003**. Changes in carbon storage and fluxes in a chronosequence of ponderosa pine. *Global Change Biology* 9(4): 510-514.

Kittel, T.G.F., P.E. Thornton, J.A. Royle, and T.N. Chase. **2002.** Climates of the Rocky Mountains: Historical and Future Patterns. Pp. 59-82 (Chapter 4), in: J.S. Baron (ed.). *Rocky Mountain Futures: An Ecological Perspective.* Island Press, Covelo, CA. 325 p.

Nemani, R.R., M.A. White, P.E. Thornton, K. Nishida, S. Reddy, J. Jenkins, S.W. Running, **2002**. Recent trends in hydrologic balance have enhanced the terrestrial carbon sink in the United States. *Geophysical Research Letters* 2002GL014867.

White, M.A., R.R. Nemani, P.E. Thornton, S.W. Running, **2002**. Satellite evidence of phenological differences between urbanized and rural areas of the eastern United States deciduous broadleaf forest. *Ecosystems* 5: 260-277.

Law, B.E., P.E. Thornton, J. Irvine, P.M. Anthoni, S. Van Tuyl, **2001**. Carbon storage and fluxes in ponderosa pine forests at different developmental stages. *Global Change Biology*, 7: 755-777.

Schimel, D., J. Melillo, H. Tian, A.D. McGuire, D. Kicklighter, T. Kittel, N. Rosenbloom, S. Running, P.Thornton, D. Ojima, W. Parton, R. Kelly, M. Sykes, R. Neilson, and B. Rizzo, **2000**. The contribution of increasing CO_2 and climate to carbon storage by natural and agricultural ecosystems of the US 1980-1993. *Science*, 287: 2004-2006.

White, M.A., P.E. Thornton, and S.W. Running, **2000**. Parameterization and sensitivity analysis of the Biome-BGC terrestrial ecosystem model. *Earth Interactions*, 4(3): 1-85.

White, M.A., S. W. Running, and P.E. Thornton, **1999**. The impact of growing-season length variability on carbon assimilation and evapotranspiration over 88 years in the eastern US deciduous forest. *Int. J. Biometeorology* 42:139-145.

White, J.D., S.W. Running, P.E. Thornton, R.E. Keane, K.C. Ryan, D.B. Fagre, and C.H. Key, **1998**. Assessing simulated ecosystem processes for climate variability research at Glacier National Park, USA. *Ecological Applications*, 8(3):805-823.

White, M.A., P.E. Thornton, and S.W. Running, **1997**. A continental phenology model for monitoring vegetation responses to interannual climatic variability. *Global Biogeochemical Cycles*, 11: 217-234.

Kimball, J.S., P.E. Thornton, M.A. White, and S.W. Running, **1997**. Simulating forest productivity and surface-atmosphere carbon exchange in the BOREAS study region. *Tree Physiology*, 17: 589-599.

W.J. Parton, A. Haxeltine, P. Thornton, R. Anne, and M. Hartman, **1996**. Ecosystem sensitivity to land-surface model and leaf area index. *Global and Planetary Change*, 13:89-98.

Mahfouf, J.-F., C.Ciret, A. Ducharne, P. Irannejad, J. Noilhan, Y. Shao, P.Thornton, Y. Xue, and Z.L. Yang, **1996**. Analysis of transpiration results from the RICE and PILPS workshop. *Global and Planetary Change*, 13: 73-88.

Shao, Y., R. Anne, A. Henderson-Sellers, P. Irannejad, P. Thornton, X. Liang, T. Chen, C. Ciret, C. Desborough, O. Balachova, A. Haxeltine, and A. Ducharne, **1994**. Soil moisture simulation: A report on the RICE and PILPS workshop. *International GEWEX Project Office Publication Series*, No. 14. World Climate Research Programme.

Other Publications (not peer reviewed)

Running, S.W., P.E. Thornton, R.R. Nemani, and J.M. Glassy, **2000**. Global Terrestrial Gross and Net Primary Productivity from the Earth Observing System. In: *Methods in Ecosystem Science*, O. Sala, R. Jackson, and H. Mooney, Eds. Springer-Verlag, New York.

Thornton, P.E., **1998**. Regional ecosystem simulation: combining surface- and satellite-based observations to study linkages between terrestrial energy and mass budgets. Ph.D. Dissertation, School of Forestry, The University of Montana, Missoula, MT., 280 pp.

Presentations at Scientific/Professional Meetings: (132 total, 71 invited) (current through August 2012)

August 2012: P. Thornton, NGEE Modeling Team. NGEE Modeling Overview. Presentation to DOE BER Program Managers, Barrow, AK. 13 August 2012.

June 2012: P. Thornton, X. Shi, J. Mao, S. Liu, **invited**. Tropical warming, nutrient cycling, and drought: Model-experiment investigation with the Community Land Model. Critical Research Needs for Tropical Ecosystems Workshop, Bethesda, MD. 5 June 2012.

May 2012: P.Thornton, NGEE-Arctic Science Team, **invited**. Next-Generation Ecosystem Experiments (NGEE Arctic): Biogeochemical and geophysical characterization of permafrost ecosystems on the North Slope of Alaska. NASA TEP Arctic Boreal Zone Workshop, Greenbelt, MD. 22 May 2012.

April 2012: P. Thornton, W.M. Post, ORNL TES SFA Team. Model-Experiment-Observation Integration. ORNL TES SFA Review, Washington, D.C. 25 April 2012.

April 2012: P. Thornton, **invited**. Process science and large-scale coupled models. Plenary presentation to DOE BER TES PI Meeting, Washington, D.C. 23 April 2012.

March 2012: P. Thornton, **invited**. Roots in the Community Land Model: Current approach and future needs. Scaling Root Processes: Global Impacts Workshop, Arlington, VA. 7 March 2012.

March 2012: P. Thornton and NGEE Science Team. Multi-scale modeling approach to improve Arctic tundra ecosystem and climate system prediction – NGEE Arctic. CESM Land and Biogeochemistry Working Group Meeting, Boulder, CO. 1 March 2012.

February 2012: P. Thornton and iESM Science Team. First results from coupled IAM-ESM (iESM): Influence of model coupling through land use and land cover change. CESM Land and Biogeochemistry Working Group Meeting, Boulder, CO. 29 February 2012.

February 2012: P. Thornton. CSSEF Land Team progress and FY2012 Planning. CSSEF All-Hands Meeting, Gaithersburg, MD. 14 February 2012.

January 2012: X. Xu, P.E. Thornton, W.M. Post. A global analysis of soil microbial biomass carbon, nitrogen, and phosphorus in terrestrial ecosystems. Poster presentation, ORNL CCSI SAB Meeting, Oak Ridge, TN. 31 January 2012.

January 2012: P. Thornton. Multi-scale carbon cycle modeling. ORNL, EESD SAB Meeting, Oak Ridge, TN. 25 January 2012.

December 2011: P. Thornton, G. Bisht, D.M. Ricciuto, and NACP Site-Synthesis Team, **invited**. Evaluating and improving land surface model predictions using site-level

observations. AGU Fall Meeting (Session B51), San Francisco, CA. 9 December 2011.

December 2011: P. Thornton and NGEE Science Team, **invited**. Modeling ecosystem-climate interactions in the high Arctic: Challenges and potential solutions. NGEE Townhall at AGU Fall Meeting, Sanfrancisco, CA. 8 December 2011.

September 2011: J. Edmonds, B. Collins, P. Thornton, **invited**. Development and early results from an integrated Earth system model. Plenary presentation at DOE, BER Climate and Earth System Modeling Annual PI Meeting, Washington, D.C. 21 September 2012.

September 2011: P. Thornton, W. Riley, N. McDowell, J.T. Randerson, F.M. Hoffman, X. Yang, M. Post, U. Mishra, C.D. Koven, C. Xu., R. Fisher, **invited**. Reducing uncertainties associated with terrestrial carbon cycle-climate system feedbacks: Improved Earth System Model process representation for arctic, tropical, and temperate systems. Plenary presentation at DOE, BER Climate and Earth System Modeling Annual PI Meeting, Washington, D.C. 20 September 2012.

September 2011: P. Thornton, J. Mao, X. Shi, CESM Biogeochemistry Working Group members, **invited**. Land ecosystem observation and process knowledge in support of predictive modeling. Carbon Cycle Science Steering Group meeting, Arlington, VA. 14 Sept 2012.

August 2011: P. Thornton, for CSSEF Land Modeling Team. CSSEF: Land Modeling, Fy 2011 progress update. Presentation at Climate Science for a Sustainable Energy Future (CSSEF) Kickoff Meeting, Gaithersburg, MD, 18 August 2011.

July 2011: P. Thornton, **invited**. Earth System Modeling. Presented to DOE BER GOAmazon 2014 Workshop, Crystal City, VA, 26 July 2011.

June 2011: P. Thornton. New observational constraints for tropical forest biogeochemistry. Presented at the Biogeochemistry Working Group Meeting, 16th Annual Community Earth System Model Workshop, Breckenridge, CO, 22 June 2011.

June 2011: P. Thornton, G. Bisht, D. Ricciuto. Evaluating modeled carbon state and flux variables against multiple NACP observational datasets. Presented at the Land Model Working Group Meeting, 16th Annual Community Earth System Model Workshop, Breckenridge, CO, 21 June 2011.

March 2011: P. Thornton, G. Bisht, J. Mao, X. Shi, F. Hoffman, K. Lindsay, S. Doney, K. Moore, N. Mahowald, J. Randerson, I. Fung, J.-F. Lamarque, J. Feddema, Y.-H. Lee, **invited**. Critical needs for new understanding of nutrient dynamics in Earth System Models. Presented at First INTERFACE Workshop, Captiva Island, FL. 1 March 2011.

February 2011: P. Thornton, **invited**. Using site-level observations to find and fix problems in CLM4. Presented to Terrestrial Science Section, NASA Goddard Space Flight Center, Greenbelt, MD. 22 February 2011.

February 2011: P. Thornton, **invited**. CMIP5: overview of the Coupled Model Intercomparison Project, Phase 5. Presented at the North American Carbon Program/AmeriFlux Meeting, New Orleans, LA. 3 February 2011.

January 2011: P. Thornton and NACP site-level synthesis participants, **invited**. NACP Site-Level Synthesis. Presented at International Land Model Benchmarking workshop, Irvine, CA. 24 January 2011.

December 2010: P. Thornton, G. Bisht, D. Ricciuto, NACP site-level synthesis participants, **invited**. Evaluation of land model simulations across multiple sites and multiple models: results from the NACP site-level synthesis effort. AGU Fall Meeting, San Francisco, CA. 16 December 2010.

October 2010: P. Thornton, X. Shi, J. Mao, CCSM Biogeochemistry and Land Model Working Group members, **invited**. High-latitude climate change experiments: model uncertainties, needed improvements, and limitations. Presented at Arctic Warming Experiments Workshop, University of Alaska, Fairbanks, AK. 13 October 2011.

September 2010: P. Thornton. Climate Change Science Institute, Theme 3: Terrestrial Ecosystems and Carbon Cycle. Presentation to CCSI Science Advisory Board. ORNL, Oak Ridge, TN. 29 September 2011.

September 2010: P. Thornton, **invited**. Carbon-nitrogen cycle coupling regulates climate-carbon cycle feedbacks. DOE Laboratory Energy Research and Development Working Group (LERDWG). Washington, D.C. 22 September 2011.

August 2010: P. Thornton. Consistency checks for ancillary biological and ecological data for NACP Site-level Synthesis. Third NACP Interim Synthesis Workshop, Boulder, CO. 26 August 2010.

August 2010: P. Thornton. Coupled climate-biogeochemistry modeling at ORNL. Presentation to RADM Titley and Navy Climate Task Force. ORNL, Oak Ridge, TN. 19 August 2010.

August 2010: P. Thornton. Coupled climate-biogeochemistry modeling at ORNL. Presentation to Air Force weather/climate team. ORNL, Oak Ridge, TN. 5 August 2010.

July 2010: P. Thornton, F. Hoffman, J. Mao, X. Shi, M. Branstetter, K. Lindsay, CESM Biogeochemistry Working Group, **invited**. Using single forcing factor experiments to explore climate-biogeochemistry feedbacks in CESM1. SciDAC 2010, Chattanooga, TN. 14 July 2010.

June 2010: Thornton, P. Planning for CCSM6: Land modeling component of CSSEF (Climate Science for a Sustainable Energy Future). Land Model Working Group, 15th Annual CESM Workshop, Breckenridge, CO. 29 June 2010.

June 2010: Thornton, P. Land BGC results from CCSM4. Biogeochemistry Working Group, 15th Annual CESM Workshop, Breckenridge, CO. 30 June 2010.

June 2010: Thornton, P. Improved soil organic matter model for CLM: Making the most of recent observational and experimental results. Biogeochemistry Working Group, 15th Annual CESM Workshop, Breckenridge, CO. 30 June 2010.

May 2010: P. Thornton, C. Cleveland, A. Finzi, G. Hurtt, N. McDowell, **invited**. Terrestrial Science Overview. DOE BER Climate Research Roadmapping Workshop, Arlington, VA. 13 May 2010.

April 2010: Edmonds, J., Collins, W., Thornton, P., Thomson, A. Integrated Earth System Models: Strengthening the coupling between Earth system models and integrated assessment models. DOE Climate Change Modeling Program Science Team Meeting, Gaithersburg, MD. 1 April 2010.

December 2009: Thornton, P., D. Ricciuto, K. Schaefer, A. Barr, M. Dietze, E. Lokupitiya, C. van Ingen, D. Agarwal, R. Cook, **invited**. American Geophysical Union Fall Meeting, San Francisco, CA. 15 December 2009.

December 2009: Thornton, P.E., Hoffman, F., Hurtt, G. Interactions of land use/land cover change with rising CO_2 and anthropogenic nitrogen deposition. American Geophysical Union Fall Meeting, San Francisco, CA. 15 December 2009.

November 2009: Thornton, P., **invited**. Parameterization of plant functional type physiology and litter/soil components in the Community Land Model. ORNL CCP Response SFA Meeting. Oak Ridge, TN. 30 November 2009.

November 2009: Thornton, P., F. Hoffman, S. Doney, K. Lindsay, K. Moore, N. Mahowald, J. Randerson, I. Fung, J.-F. Lamarque, J. Feddema, Y.-H. Lee, R. Norby, **invited**. Influence of carbon-nitrogen cycle coupling and land use change on climate-carbon cycle feedbacks. U.S. China Workshop on the Climate-Energy Nexus. ORNL, Oak Ridge, TN. 13 November 2009.

October 2009: Thornton, P., **invited**. Climate-biogeochemistry-land use interactions: an Earth system modeling and analysis frontier. Presentation to Conrad Lautenbacher, at ORNL. Oak Ridge, TN. 15 October 2009.

October 2009: Thornton, P. Overview of CLM: Biophysics, biogeochemistry, and handling of land use and land cover change. Integrated Earth System Modeling Prjoct Meeting, JGCRI, University of Maryland, MD. 13 October 2009.

September 2009: Thornton, P. Overview of CLM: Biophysics, biogeochemistry, and handling of land use and land cover change. IAM-ESM Project Meeting, JGCRI, University of Maryland, College Park, MD. 23 September 2009.

September 2009: Thornton, P., Schaefer, K., NACP site Synthesis participants. Preliminary results of model-data intercomparison for the NACP Site-level Synthesis. AmeriFlux Annual PI Meeting. Washington, D.C. 22 September 2009.

September 2009: Thornton, P., **invited.** Climate-carbon cycle feedbacks. Presentation to NOAA administrators. ORNL, Oak Ridge, TN. 11 September 2009.

July 2009: Thornton, P., **invited.** The global carbon cycle and its interactions with other biogeochemical cycles and climate. IPCC AR5 Scoping Meeting, Venice, Italy. 15 July 2009.

April 2009: Thornton, P., **invited**. Recent modifications to CLM-CN improve seasonal cycle and other C-LAMP metrics. CCSM-BGC Working Group Meeting, NCAR, Boulder, CO. 1 April 2009.

March 2009: Thornton, P. Site-level synthesis of modeled and measured carbon, water, and energy fluxes across North America: Evaluation of model and measurement uncertainty. CCSM-BGC Working Group Meeting, NCAR, Boulder, CO. 31 March 2009.

March 2009: Thornton, P., A.W. King, W.M. Post, F.M. Hoffman. Prognostic land-use and land cover change for a coupled climate-biogeochemistry model. CCSM-Land Model Working Group Meeting, NCAR, Boulder, CO. 30 March 2009.

February 2009: Thornton, P. and 90 co-authors. NACP Interim Synthesis: Site-level evaluation of uncertainty in observed and modeled carbon stocks and fluxes. Second NACP All-Investigators' Meeting, San Diego, CA. 18 February 2009.

February 2009: Cescatti, A., Thornton, P., Zaehle, S., **invited**. Carbon-nitrogen interactions at global-scale: emerging scientific issues and potential climate feedbacks. European Commission Workshop, Stockholm. 26 February 2009.

February 2009: Thornton, P., **invited**. Plant-microbe interactions regulate climate-carbon cycle feedbacks: A new frontier for climate modeling. DOE-sponsored Genes-to-Life annual investigator's meeting, Bethesdad, MD. 11 February 2009.

February 2009: Thornton, P. Evaluation of seasonal cycle of atmospheric CO_2 and recent modifications to CLM-CN. CCSM Scientist's Meeting, NCAR, Boulder, CO. 4 February 2009.

January 2009: Thornton, P. and co-authors. NACP Interim Synthesis: Update on Site-level evaluation of uncertainty in observed and modeled carbon stocks and fluxes. NACP Synthesis Workshop, ORNL, Oak Ridge, TN. 7 January 2009.

December 2008: Thornton, P. S. Doney, K. Lindsay, K. Moore, N. Mahowald, J. Randerson, I. Fung, J.-F. Lamarque, J. Feddema, Y.-H. Lee, **invited**. Competition between plants and microbes for available mineral nitrogen: evaluation against experimental results and consequences for carbon-climate feedbacks. American Geophysical Union Fall Meeting, San Francisco, CA. 19 December 2008.

December 2008: Thornton, P., F. Hoffman, R. Norby, CCSM BGC and Land Model Working Groups, **invited**. Disturbance history and nitrogen cycle controls on ecosystem response to increased CO_2. American Geophysical Union Fall Meeting, San Francisco, CA. 17 December 2008.

September 2008: Thornton, P., S. Doney, K. Lindsay, K. Moore, N. Mahowald, J. Randerson, I. Fung, J.-F. Lamarque, J. Feddema, Y.-H. Lee, **invited**. Fundamental influence of carbon-nitrogen cycle coupling on climate-carbon cycle feedbacks. International Union of Forest Research Organizations (IUFRO) Conference, Murten, Switzerland. 10 September 2008.

June 2008: Thornton, P., S. Levis. CLM-CN update: progress toward CLM4.0. CCSM Biogeochemistry Working Group, Annual CCSM Workshop, Breckenridge, CO.

February 2008: Thornton, P., **invited**. Influence of coupled carbon-nitrogen cycles on climate-carbon feedbacks. UCAR Board of Trustees Annual Meeting, NCAR, Boulder, CO. 27 February 2008.

February 2008: Thornton, P., J. Randerson, and BGC Working Group, **invited**. C-LAMP science results and CLM-CN update. NCAR, Boulder, CO. 22 February 2008.

January 2008: Thornton, P., S. Doney, K. Lindsay, K. Moore, N. Mahowald, J. Randerson, I. Fung, J.-F. Lamarque, J. Feddema, Y.-H. Lee, **invited**. Carbon-nitrogen cycle coupling regulates climate-carbon cycle feedbacks. Laboratory Seminar, Appalachian Laboratory, University of Maryland, Frostburg, MD. 28 January 2008.

December 2007: Thornton, P., S. Doney, K. Lindsay, K. Moore, N. Mahowald, J. Randerson, I. Fung, J.-F. Lamarque, J. Feddema, Y.-H. Lee. Carbon-nitrogen cycle coupling regulates climate-carbon cycle feedbacks. Climate and Global Dymanics Division Seminar, NCAR, Boulder, CO. 18 December 2007.

December 2007: Thornton, P., S. Doney, K. Lindsay, K. Moore, N. Mahowald, J. Randerson, I. Fung, J.-F. Lamarque, J. Feddema, Y.-H. Lee. Fundamental influence of carbon-nitrogen cycle coupling on climate-carbon cycle feedbacks. American Geophysical Union Fall Meeting, San Francisco, CA. 12 December 2007.

November 2007: Thornton, P., Doney, S., Moore, J.K., Lindsay, K., Mahowald, N., Vertenstein, M., Hoffman, F., Lamarque, J.-F., Rosenbloom, N., Holland, E., Feddema, J. Fundamental influence of carbon-nitrogen cycle coupling on climate-

carbon cycle feedbacks. Department Seminar, Laboratoire des Sciences du Climat et de l'Environnement (LSCE), Gif-Sur-Yvette, France. 9 November 2007.

November 2007: Thornton, P., Doney, S., Moore, J.K., Lindsay, K., Mahowald, N., Vertenstein, M., Hoffman, F., Lamarque, J.-F., Rosenbloom, N., Holland, E., Feddema, J., **invited**. Fundamental influence of carbon-nitrogen cycle coupling on climate-carbon cycle feedbacks. Department Seminar, European Commission Joint Research Centre, Institute for Environment and Sustainability, Ispra, Italy. 7 November 2007.

November 2007: Thornton, P., Doney, S., Moore, J.K., Lindsay, K., Mahowald, N., Vertenstein, M., Hoffman, F., Lamarque, J.-F., Rosenbloom, N., Holland, E., Feddema, J. Fundamental influence of carbon-nitrogen cycle coupling on climate-carbon cycle feedbacks. Department Seminar, Physics Institute (Climate and Environmental Physics), University of Bern, Bern, Switzerland. 5 November 2007.

November 2007: Thornton, P., Doney, S., Moore, J.K., Lindsay, K., Mahowald, N., Vertenstein, M., Hoffman, F., Lamarque, J.-F., Rosenbloom, N., Holland, E., Feddema, J., **invited**. Fundamental influence of carbon-nitrogen cycle coupling on climate-carbon cycle feedbacks. WSL Research Seminar, Swiss Federal Research Institute WSL, Birmensdorf, Switzerland. 2 November 2007.

October 2007: Thornton, P., Doney, S., Moore, J.K., Lindsay, K., Mahowald, N., Vertenstein, M., Hoffman, F., Lamarque, J.-F., Rosenbloom, N., Holland, E., Feddema, J. Fundamental influence of carbon-nitrogen cycle coupling on climate-carbon cycle feedbacks. Met Office Seminar, UK Met Office, Exeter, UK. 30 October 2007.

October 2007: Thornton, P., Doney, S., Moore, J.K., Lindsay, K., Mahowald, N., Vertenstein, M., Hoffman, F., Lamarque, J.-F., Rosenbloom, N., Holland, E., Feddema, J. Fundamental influence of carbon-nitrogen cycle coupling on climate-carbon cycle feedbacks. QUEST Seminar, Department of Earth Sciences, University of Bristol, Bristol, UK. 29 October 2007.

October 2007: Thornton, P., Doney, S., Moore, J.K., Lindsay, K., Mahowald, N., Vertenstein, M., Hoffman, F., Lamarque, J.-F., Rosenbloom, N., Holland, E., Feddema, J., **invited**. Fundamental influence of carbon-nitrogen cycle coupling on climate-carbon cycle feedbacks. Department Seminar, Potsdam Institute for Climate Impact Research, Potsdam, Germany. 26 October 2007.

October 2007: Thornton, P., Doney, S., Moore, J.K., Lindsay, K., Mahowald, N., Vertenstein, M., Hoffman, F., Lamarque, J.-F., Rosenbloom, N., Holland, E., Feddema, J., **invited**. Fundamental influence of carbon-nitrogen cycle coupling on climate-carbon cycle feedbacks. Department Seminar, Max Planck Institute for Biogeochemistry, Jena, Germany. 25 October 2007.

October 2007: Thornton, P., Doney, S., Moore, J.K., Lindsay, K., Mahowald, N., Vertenstein, M., Hoffman, F., Lamarque, J.-F., Rosenbloom, N., Holland, E., Feddema, J. Fundamental influence of carbon-nitrogen cycle coupling on climate-carbon cycle feedbacks. Department Seminar, Max Planck Institute for Meteorology, Hamburg, Germany. 22 October 2007.

October 2007: Thornton, P., **invited**. Climate-biosphere modeling: Continental and global patterns. AmeriFlux Annual Science Team Meeting. Boulder, CO. 18 October 2007.

September 2007: Thornton, P., **invited**. Frontiers in climate system modeling. United Nations advisory group on Groundwater Resource Assessment Under the Pressures of Humanity and Climate Change. NCAR, Boulder, CO. 20 September 2007.

September 2007: Thornton, P., **invited**. Coupling between water, energy, carbon and nitrogen cycles. University of Illinois Hydrologic Synthesis Workshop, Allerton Park, IL. 12 September 2007.

August 2007: Thornton, P., CCSM biogeochemistry Working Group members, C4MIP participants, **invited**. Influence of carbon-nitrogen coupling on climate-carbon feedbacks. Presentation to NSF site visit. NCAR, Boulder, CO. 9 August 2007.

July 2007: Thornton, P., C4MIP participants, **invited**. Coordinating land use assumptions. Climate Change Impacts and Integrated Assessment Workshop, Snowmass, CO. 31 July 2007.

July 2007: Thornton, P., Lindsay, K., Doney, S., Moore, K., Mahowald, N., Vertenstein, M., Hoffmann, F., Lamarque, J.-F., Rosenbloom, N., Holland, E., Feddema, J., **invited**. Fundamental influence of carbon-nitrogen cycle coupling on climate-carbon cycle feedbacks. Gordon Research Conference, Colby-Sawyer College, New London, NH.

May 2007: Thornton, P., Lamarque, J.-F., Rosenbloom, N., Lindsay, K., Doney, S., Moore, K., Mahowald, N., Vertenstein, M., Hoffmann, F., Feddema, J. Fundamental influence of carbon-nitrogen cycle coupling on climate-carbon cycle feedbacks. Climate and Global Dynamics Division Seminar, NCAR, Boulder, CO.

March 2007: Thornton, P., **invited**. Fundamental influence of carbon-nitrogen cycle coupling on climate-carbon cycle feedbacks. Oak Ridge National Laboratory, Environmental Sciences Division Seminar, Oak Ridge, TN. 15 March 2007.

March 2007: Thornton, P. Preliminary results from fully coupled climate-carbon-nitrogen cycle simulations. CGD Research Reports, Boulder, CO. 8 March 2007.

February 2007: Thornton, P., Oleson, K., Lawrence, D. Introduction of Btran control for partially-frozen soils and effective N limitation control on Vcmax in LMWG new hydrology. CCSM Land Model Working Group Meeting, Boulder, CO. 28 February 2007.

February 2007: Thornton, P., Lindsay, K., **invited**. Status of biogeochemistry code and model spinup for CCSM3.5. Joint CCSM Chemistry/Biogeochemistry/Land Working Group Meeting, Boulder, CO. 26 February 2007.

February 2007: Thornton, P., Lindsay, K., Doney, S., Moore, K., Mahowald, N., **invited**. Results from fully-coupled climate-biogeochemistry simulations with CCSM3.1BGC. Joint CCSM Chemistry/Biogeochemistry/Land Working Group Meeting, Boulder, CO. 26 February 2007.

February 2007: Thornton, P., Lamarque, J.-F., Rosenbloom, N., Mahowald, N., **invited**. Effects of terrestrial carbon-nitrogen coupling on carbon-climate feedbacks. Atmospheric Sciences Department Seminar, Colorado State University, Fort Collins, CO. 8 February 2007.

January 2007: Thornton, P., Lamarque, J.-F., Rosenbloom, N., Zimmermann, N. Effects of carbon-nitrogen cycle coupling on Climate-carbon feedbacks (poster). North American Carbon Program Principal Investigator's Meeting, Colorado Springs, CO. 24 January 2007.

January 2007: Thornton, P., Cook, R., Post, W.M., Wilson, B., Hartsough, C. A high-resolution daily surface weather database for NACP investigations (poster). North American Carbon Program Principal Investigator's Meeting, Colorado Springs, CO. 23 January 2007.

December 2006: Thornton, P., Lamarque, J.-F., Rosenbloom, N., Mahowald, N., Vertenstein, M., Lee, J., Hoffmann, F. Effects of terrestrial carbon-nitrogen coupling on carbon-climate feedbacks. AGU Fall Meeting, San Francisco, CA. 15 December 2006.

December 2006: Thornton, P., **invited**. Update on CCSM Biogeochemistry. CGD/CCR Section Meeting, Boulder, CO. 4 December 2006.

September 2006: P. Thornton. Interactions between terrestrial carbon and nitrogen cycles and the climate system. TIIMES Seminar, Boulder, CO. 7 September 2006.

August 2006: N. Mahowald/P. Thornton (co-presentation), K. Lindsay, J. Lee, S. Doney, J. Randerson. BGC plans for January 1 coupling. CCSM Scientists Meeting, Boulder, CO. 18 August 2006.

June 2006: N. Wilhelmi, P. Thornton. Grid-BGC: a Grid-enabled research platform for high-resolution surface weather interpolation and biogeochemical process modeling. Earth Science Technology Conference, College Park, MD. 27 June 2006.

June 2006: Thornton, P., N. Mahowald, F. Hoffmann, N. Rosenbloom. Preliminary results from C-LAMP intercomparison. CCSM Meeting, Breckenridge, CO. 21 June 2006.

June 2006: Thornton, P., **invited**. Carbon – Nitrogen – Climate Coupling. Lecture to ASP Colloquium "The Art of Climate Modeling", Boulder, CO. 9 June 2006.

May 2006: Thornton, P. Interactions between terrestrial carbon and nitrogen cycles and the climate system. Climate and Global Dynamics Division Seminar, NCAR, Boulder, CO. 2 May 2006.

April 2006: P. Thornton, **invited**. Recent science modifications to Biome-BGC. Biome-BGC Developers Meeting, Missoula, MT. 25 April 2006.

March 2006: Thornton, P., J.-F. Lamarque, M. Vertenstein, N. Rosenbloom, J. Lee. CLM-CN update: sensitivity to CO_2, temperature, and precipitation in C-only vs. C-N mode. CCSM Biogeochemistry Working Group meeting, Boulder, CO. 29 March 2006.

March 2006: Thornton, P., J.-F. Lamarque, M. Vertenstein, N. Rosenbloom, **invited**. Carbon-nitrogen cycle interactions, ozone stress, and N emissions speciation. CCSM Chemistry-Climate Working Group meeting, Boulder, CO. 23 March 2006.

February 2006: Thornton, P., M. Vertenstein, J. Lee, J.-F. Lamarque, N. Rosenbloom, **invited**. Terrestrial carbon-nitrogen cycle coupling and interactions with the climate system. American Association for the Advancement of Science, Annual Meeting. St. Louis, MO. 20 February 2006.

December 2005: Thornton, P., M. Vertenstein, J. Lee, J.-F. Lamarque, N. Rosenbloom. Terrestrial carbon-nitrogen cycle coupling and interactions with the climate system. American Geophysical Union, Fall Meeting 2005. San Francisco, CA. 7 December 2005.

October 2005: Thornton, P., T. Stiefel, B.E. Law, **invited**. Interactions between disturbance, and anthropogenic and experimental increases in CO_2 and nitrogen deposition. AmeriFlux Annual Meeting. Boulder, CO. 18 October 2005.

October 2005: Thornton, P. Prognostic vs. diagnostic canopy treatment in CCSM. NCAR CGD Research Reports. Boulder, CO. 13 October 2005.

September 2005: Thornton, P., S. Denning, **invited**. North American Carbon Program – Overview. Ocean Carbon and Climate Change (OCCC) North American Continental Margins – Coastal CO_2 Workshop. Boulder, CO. 21 September 2005.

September 2005: Thornton, P., **invited**. Update on CCSM3 biogeochemistry simulations using CLM3-CN. CCSM Scientists Meeting. NCAR, Boulder, CO. 15 September 2005.

July 2005: Thornton, P. Interactions between TIIMES and CCSM. Atmosphere-Hydrosphere-Biosphere Focus Group Retreat (TIIMES). NCAR, Boulder, CO. 15 July 2005.

July 2005: Thornton, P., **invited**. Gridded daily surface weather: The challenges of spatio-temporal data. GIS in Weather Workshop. NCAR, Boulder, CO. 6 July 2005.

June 2005: Thornton, P., **invited**. CCSM3 climate-biogeochemistry simulations using CLM3-CN. CCSM Workshop, Biogeochemistry Working Group Meeting. Breckenridge, CO. 23 June 2005.

June 2005: Thornton, P., **invited**. CCSM3 climate – biogeochemistry simulations using CLM3-CN. CCSM Workshop, Land Model Working Group Meeting. Breckenridge, CO. 22 June 2005.

May 2005: Thornton, P., **invited**. Overview of terrestrial biogeochemistry module in CCSM. CGD/Climate Change Research section meeting. Boulder, CO. 2 May 2005.

April 2005: Thornton, P. Coupled terrestrial carbon and nitrogen cycles in CCSM3. NCAR Early Career Scientists' Assembly Poster Session. Boulder, CO. 15 April 2005.

March 2005: Thornton, P., **invited**. Impact of modifications in CLM hydrology on coupled carbon-nitrogen cycle simulations. Land Model Working Group Meeting, Boulder, CO, 14 March 2005.

March 2005: Thornton, P. Progress in coupled carbon-nitrogen cycle modeling within CCSM3. NCAR CGD Research Report, 5 March 2005.

February 2005: Thornton, P., J.-F. Lamarque, **invited**. Interactions between terrestrial carbon and nitrogen cycles. 3rd Chemistry-Climate Interactions Workshop, Boulder, CO, 15 February 2005.

February 2005: Thornton, P., **invited**. Interactions between water cycle and biogeochemistry. TIMES Retreat, Boulder, CO, 2 February 2005.

January 2005: **Co-chair**, North American Carbon Program – Data Management Planning Workshop. New Orleans, LA. 25-27 January, 2005.

December 2004: Thornton, P., J.-F. Lamarque. First results from coupling carbon cycle, nitrogen cycle, and climate in the NCAR Community Climate System Model (CCSM3). American Geophysical Union Fall Meeting, San Francisco, CA, 15 December 2004.

December 2004: Thornton, P., **invited**. Preliminary offline and coupled (CCSM3) results from CLM3-CN, a new land model with coupled carbon and nitrogen cycles. C4MIP Meeting, Berkeley, CA, 12 December 2004.

November 2004: Thornton, P., **invited**. Controls on nitrogen cycling and carbon-nitrogen coupling in forest ecosystems. Forest N deposition – Ecosystem Functioning Workshop, Boulder, CO, 7 November 2004

October 2004: Thornton, P., **invited**. Implementing a grid-compute engine for high-resolution terrestrial biogeochemistry modeling. NCAR SCD Executive Committee Meeting, 27 October 2004.

August 2004: Thornton, P., **invited**. Biogeochemistry and Climate. NCAR Climate and Global Change Workshop for geoscience educators, Boulder, CO, 2 August 2004.

July 2004: Thornton, P., M. Vertenstein, N. Rosenbloom, and J.-F. Lamarque, **invited**. C4MIP update: Coupling LCM3-CN to CAM3 within CCSM3. Biogeochemistry Working Group Meeting – CCSM3 Workshop, Santa Fe, NM, 8 July 2004.

July 2004: CCSM Workshop, Biogeochemistry Working Group. "C4MIP Update: coupling CLM3-CN to CAM3 within CCSM3." Santa Fe, NM.

July 2004: CCSM Workshop, Land Model Working Group. "Coupling carbon, nitrogen, and climate: offline and coupled results from CCSM3 Land Biogeochemistry Component (CLM3-CN)." Santa Fe, NM.

June 2004: NCAR Biogeosciences Advisory Committee Meeting. P.E. Thornton, N. Mahowald, G. Bonan, E. Holland, "Global modeling component of the NCAR Biogeosciences Initiative." Boulder, CO.

May 2004: **Invited talk**: Oak Ridge National Laboratory DAAC User Working Group Meeting. "A Grid-Compute architecture for high resolution terrestrial biogeochemistry model applications." Ft. Collins, CO.

March 2004: CCSM Biogeochemistry Working Group Meeting. "Coupled carbon and nitrogen cycles: new land biogeochemistry Component for CCSM-3." Boulder, CO.

February 2004: **Invited talk**: UCAR Board of Trustees Meeting. P.E. Thornton, E. Holland, S. Doney, "Overview of Biogeochemistry Research at NCAR." Boulder, CO.

December 2003: **Invited talk**: AGU Fall Meeting. C. Still*, D. Schimel, P. Thornton, B. Stephens, "Productivity and carbon storage: insights from new measurements and models." San Francisco, CA.

October 2003: **Invited talk**: Annual AmeriFlux Meeting. "Interactions between climate, CO_2, N deposition, and disturbance, and their influence on net ecosystem carbon exchange." Boulder, CO.

October 2003: Guest lecture, Colorado State University, Graduate hydrology program. "Surface weather data for research applications in hydrology." Ft. Collins, CO.

June 2003: CCSM Workshop, Biogeochemistry Working Group. "Terrestrial carbon cycle and carbon-nitrogen cycle coupling in CLM." Breckenridge, CO.

June 2003: CCSM Workshop, Land Model Working Group. "Terrestrial carbon cycle and carbon-nitrogen cycle coupling in CLM." Breckenridge, CO.

May 2003: **Invited talk**: Oak Ridge National Laboratory, User Working Group Meeting. "Archiving models at ORNL DAAC". Oak Ridge, TN.

May 2003: CGD Seminar. "Evaluating a land surface model across spatial scales".

April 2003, **Invited talk**: BE Law*, PE Thornton, "Regional soil respiration: Responses to environment". 28-30 April, 2003. TERACC Workshop on Interactions Between Increasing CO_2 and Temperature in Terrestrial Ecosystems. Lake Tahoe, CA.

March 2003, **Invited talk**: International Symposium – State-of-the-art in Vegetation Monitoring Approaches. "Combining remote sensing observations and process

models for biophysical and biological monitoring." Swiss Federal Research Institute. Birmensdorf, Switzerland.

February 2003: CCSM Land Model Working Group Meeting. "Coupled carbon and nitrogen cycles in CLM: Objectives, current work, and plans for 2003." Boulder, CO.

December 2002, **Invited talk**: American Geophysical Union, Fall Meeting. "Controls on the seasonal cycle of net ecosystem carbon exchange." San Francisco, CA.

October 2002, **Invited talk**: Annual AmeriFlux Investigators Meeting. "Effects of disturbance, CO_2, and N deposition on fluxes." Boulder, CO.

September 2002: IGAC Meeting. "Integration of bio-atmospheric cycling of carbon and nitrogen into Earth system models." (Elisabeth A. Holland*, Alex Guenther, Christine Wiedinmyer, James Sulzman, Sam Levis, Gordon Bonan, Xuexi Tie, Peter Thornton, Scott Doney)

June 2002: CCSM Workshop, Biogeochemistry Working Group. "CLM 2.1: A new framework for carbon and nitrogen biogeochemistry and disturbance dynamics in the CCSM land model." Breckenridge, CO.

June 2002: CCSM Workshop, Land Model Working Group. "An introduction to CLM2.1 and evaluation of controls on carbon and water cycle." Breckenridge, CO.

March 2002: CCSM Joint Biogeochemistry/Land Working Group meeting. "Land biogeochemistry developments for CCSM2: current status and near-term plans." Boulder, CO.

December 2001: American Geophysical Union Fall Meeting. "Modeling and measuring the effects of disturbance history and climate on carbon and water budgets in evergreen needleleaf forests." San Francisco, CA.

August 2000: Ecological Society of America Annual Meeting. "Relationship between decadal anomalies in climate and model-estimated AET, NPP, and net ecosystem carbon exchange over the U.S., 1895-1993: Results from VEMAP Phase 2." Snowbird, UT.

August 1999: Ecological Society of America Annual Meeting. "Net primary production from the MODIS sensor." (P.E. Thornton and S.W. Running*) Spokane, WA.

July 1999: International Union of Geophysics and Geodesy Annual Meeting. "Predicted NPP, NEE, and carbon stocks for historic and potential future climate scenarios over the U.S.: Model results from VEMAP Phase 2." (P.E. Thornton*, D.S. Schimel, and VEMAP members). One of three invited talks to present VEMAP results to the international community. Birmingham, UK.

Committee Membership and Community Service:

April 2011 – present: **Invited member**, U.S. Carbon Cycle Science Steering Group.

September 2010 – present: **Invited member**, Carbon Dioxide Information and Archive Center (CDIAC), Users Working Group.

July 2010 – present: **Lead Author**, IPCC WGI, Fifth Assessment Report. Chapter 6: Carbon and Other Biogeochemical Cycles.

January 2009: **Chair**, Organizing Committee for the Second NACP All-Investigators' Meeting, San Diego, CA.

December 2007: **Co-chair**, Biogeosciences Session, "Role of Climate, Carbon and Limiting Nutrient Cycles, and Human Activities in Terrestrial Ecosystems", AGU Fall Meeting, San Francisco, CA.

August 2006: **Invited member**, External review panel, AmeriFlux Data System. Oak Ridge, TN. 15 August 2006.

July 2005: **Co-chair**: Atmosphere-Hydrosphere-Biosphere Focus Group Retreat (TIIMES). NCAR, Boulder, CO. 15 July 2005.

July 2005: **Panel member**: NCAR Director's Opportunity Fund Review Panel.

January 2005 – present: **Co-Chair**, Continental Synthesis Task Force, North American Carbon Program Science Steering Group.

January 2005 – present: **Co-Chair**, Data System Task Force, North American Carbon Program Science Steering Group.

January 2005 – present: **Invited member**, Science Steering Group for the North American Carbon Program.

December 2004 – 2008 **Chair**, Regional and Global Data Subcommittee, Oak Ridge National Laboratory Data Active Archive Center (ORNL DAAC) User Working Group.

December 2004 – 2008: **Invited member**, Oak Ridge National Laboratory Data Active Archive Center (ORNL DAAC) User Working Group (second term).

October 2004-present: **Invited member**: AmeriFlux Network Steering Committee.

August 2004: **Invited speaker**: UCAR Teachers Workshop. "Biogeochemistry and Climate", Boulder, CO.

July 2004-January 2005: **Co-chair**: North American Carbon Program Data Workshop Steering Committee.

December 2003 – December 2005: **Chair:** NCAR Early Career Scientists Association (served two one-year terms).

October 2003: **Co-chair**: UCAR Members Meeting, Biogeochemistry Forum.

September 2003: **Invited participant**: Coupled Climate Carbon-Cycle Model Intercomparison Project (C4MIP) workshop, Hamburg.

May 2003: **Invited participant**: North American Carbon Program (NACP) PI Meeting, Washington, D.C.

April 2003: **Invited Speaker**, University of Colorado Workshop for Environmental Journalists. "Evaluating models of terrestrial biogeochemical processes".

April 2003: **Invited Delegate**, Congressional Visits Day, Science Engineering and Technology Work Group, Washington, D.C. Visits to congressional offices in support of strong federal funding for R&D in the Physical and Earth Sciences.

January 2003 – present: **Invited member**, Editorial Review Board for the journal Tree Physiology.

December 2002: **Co-chair**, AGU Biogeosciences Special Session: "Water, energy, and carbon exchange in forest systems." Fall AGU Meeting, San Francisco, CA.

September 2002 – May 2003: CGD Seminar Series Coordinator.

March 2002: **Chair**, Code review committee for CCSM Community Land Model version 2.1.

December 2001 – present: **Invited member**, AGU Biogeosciences Section Meetings Committee.

November 2001 – December 2004: **Invited member**, Oak Ridge National Laboratory Data Active Archive Center (ORNL DAAC) User Working Group.

December 2001: **Co-chair**, AGU Biogeosciences Special Session: "Water, energy, and carbon exchange in forest systems." Fall AGU Meeting, San Francisco, CA.