CURRICULUM VITAE

Gordon Blackwell Bonan

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EDUCATION

Ph.D.	Environmental Sciences	University of Virginia	1988
M.S.	Forest Resources	University of Georgia	1984
B.A.	Environmental Sciences	University of Virginia	1982

APPOINTMENTS

National Center for Atmospheric Research, Boulder, Colorado

Climate and Global Dynamics
Scientist I (8/91-7/94), Scientist II (7/94-7/97), Scientist III (7/97-7/02), Senior Scientist (7/02-present), Terrestrial Sciences Section Head (1/02-4/19)

Advanced Study Program, Postdoctoral Fellow (8/89-8/91)

NASA/Goddard Space Flight Center, Greenbelt, Maryland
National Research Council Research Associate (9/88-8/89)

International Institute for Applied Systems Analysis, Laxenburg, Austria
Associate Research Scholar (6/88-7/88)

HONORS, AWARDS, FELLOWSHIPS

Young Scientists Summer Program, International Institute for Applied Systems Analysis, Laxenburg, Austria, 1987

National Research Council Research Associate, NASA/Goddard Space Flight Center, Greenbelt, Maryland, 1988-1989

Postdoctoral Fellow, Advanced Study Program, National Center for Atmospheric Research, Boulder, Colorado, 1989-1991

Mitchell International Prize for Sustainable Development, Young Scholars Competition, Center for Growth Studies, The Woodlands, Texas, "Atmosphere-biosphere exchange of carbon dioxide in boreal forests: a potential global change feedback," 1991

NCAR Special Recognition Award, “Ecological Climatology,” 2012

Clarivate Web of Science highly cited researcher, 2014-2021

Fellow, American Geophysical Union, 2013

Fellow, American Meteorological Society, 2018

Fellow, Ecological Society of America, 2019

American Geophysical Union, John Tyndall History of Global Environmental Change Lecture (2020)

PROFESSIONAL SERVICE

EDITORSHIPS

Editorial Board, *Climatic Change*, 1992-1998
Editorial Advisory Board, *Global Change Biology*, 1994-2007
Editor, *Journal of Climate*, 1998-2003
Editor (interim), *Earth Interactions*, 2008
Editor, *Earth System Dynamics*, 2010-2012
Editorial Board, *Current Opinion in Environmental Sustainability*, 2015-2018

COMMITTEES

co-chair, Arctic System Science (ARCSS) Advisory Committee modeling working group (National Science Foundation), 1995-1996

co-chair, Community Earth System Model land model working Group (NCAR), 1997-2006

member, Climate Research Committee (Board on Atmospheric Sciences and Climate, National Research Council), 2001-2003

member, Panel on Climate Change Feedbacks (Board on Atmospheric Sciences and Climate, National Research Council), 2001-2003

member, Community Earth System Model scientific steering committee (NCAR), 2003-2009

co-chair, Community Earth System Model biogeochemistry working group (NCAR), 2007-2014

member, Integrated Land Ecosystem-Atmosphere Processes Study (iLEAPS) scientific steering committee (International Geosphere-Biosphere Programme), 2010-2014

member, National Ecological Observatory Network (NEON) terrestrial biogeochemistry technical working group, 2012-2016

member, Next Generation Ecosystem Experiment (NGEE) Tropics scientific advisory board (Department of Energy), 2014-2021

member, 10th International Conference on Carbon Dioxide (ICDC10) scientific steering committee, 2015-2017

member, Significant Opportunities in Atmospheric Research and Science (SOARS) steering committee (University Corporation for Atmospheric Research), 2016-2021

chair, Max Planck Institute for Biogeochemistry (Jena) scientific advisory board (2017-2022)

member, American Meteorological Society (AMS) Committee on Ecological Forecasting (2019-present)

PROFESSIONAL SOCIETIES

American Geophysical Union

American Meteorological Society
Ecological Society of America

RESEARCH INTERESTS

I study the interactions of terrestrial ecosystems with the atmosphere. My research integrates terrestrial plant ecology, biogeochemistry, hydrology, and atmospheric sciences to study terrestrial ecosystems, their responses to climate change, feedbacks that amplify or mitigate climate change, and also anthropogenic changes in land cover, land use, and ecosystem functions that alter climate. My research discovers and advances knowledge of the processes by which natural and human-managed ecosystems affect climate; represents this understanding in models of Earth's biosphere, atmosphere, hydrosphere, and geosphere system; and applies the models to serve societal needs for planetary habitability and sustainability. I am particularly interested in forest–climate interactions and the ways in which forests affect climate.

PUBLICATIONS

BOOKS

[1] Shugart, H.H., R. Leemans, and **G.B. Bonan** (eds). 1992. A Systems Analysis of the Global Boreal Forest. Cambridge University Press, Cambridge. 565 pp.

[2] **Bonan, G.B.** 2002. Ecological Climatology: Concepts and Applications. Cambridge University Press, Cambridge. 678 pp.

[3] **Bonan, G.B.** 2008. Ecological Climatology: Concepts and Applications. 2nd edition. Cambridge University Press, Cambridge. 550 pp.

[4] **Bonan, G.B.** 2016. Ecological Climatology: Concepts and Applications. 3rd edition. Cambridge University Press, Cambridge. 692 pp.

[5] **Bonan, G.B.** 2019. Climate Change and Terrestrial Ecosystem Modeling. Cambridge University Press, Cambridge. 437 pp.

TECHNICAL REPORTS

[1] **Bonan, G.B.** 1988. A simulation model of environmental processes and vegetation patterns in boreal forests: Test case Fairbanks, Alaska. Working Paper WP-88-63. International Institute for Applied Systems Analysis, Laxenburg, Austria. 63 pp.

[2] Korzukhin, M.D., A.E. Rubinina, **G.B. Bonan**, A.M. Solomon, and M.Ya. Antonovsky. 1989. The silvics of some East European and Siberian boreal forest tree species. Working Paper WP-89-56. International Institute for Applied Systems Analysis, Laxenburg, Austria. 27 pp.

[3] Prentice, I.C., R.S. Webb, M.T. Ter-Mikhaelian, A.M. Solomon, T.M. Smith, S.E. Pitovranov, N.T. Nikolov, A.A. Minin, R. Leemans, S. Lavorel, M.D. Korzukhin, J.P. Hrabovszky, H.O. Helmisaari, S.P. Harrison, W.R. Emanuel, and **G.B. Bonan**. 1989. Developing a global vegetation dynamics model: Results of an IIASA summer workshop. Research Report RR-89-7. International Institute for Applied Systems Analysis, Laxenburg, Austria. 48 pp.

[4] Pitman, A.J., A. Henderson-Sellers, F. Abramopoulos, R. Avissar, **G. Bonan**, A. Boone, R.E. Dickinson, M. Ek, D. Entekhabi, J. Famiglietti, J.R. Garratt, M. Frech, A. Hahmann, R. Koster,

E. Kowalczyk, K. Laval, J. Lean, T.J. Lee, D. Lettenmaier, X. Liang, J.-F. Mahfouf, L. Mahrt, P.C.D. Milly, K. Mitchell, N. deNoblet, J. Noilhan, H. Pan, R. Pielke, A. Robock, C. Rosenzweig, C.A. Shlosser, R. Scott, M. Suarez, S. Thompson, D. Verseghy, P. Wetzel, E. Wood, Y. Xue, Z.-L. Yang, and L. Zhang. 1993. Project for intercomparison of land-surface parameterization schemes (PILPS): Results from off-line control simulations (Phase 1a). Publication Number 7, International GEWEX Project Office, Washington, D.C.

[5] **Bonan, G.B.** 1996. A land surface model (LSM version 1.0) for ecological, hydrological, and atmospheric studies: Technical description and user's guide. NCAR Technical Note NCAR/TN-417+STR. National Center for Atmospheric Research, Boulder, Colorado. 150 pp.

[6] **Bonan, G.B.** 1996. The NCAR land surface model (LSM version 1.0) coupled to the NCAR Community Climate Model. NCAR Technical Note NCAR/TN-429+STR. National Center for Atmospheric Research, Boulder, Colorado. 171 pp.

[7] Kiehl, J.T., J.J. Hack, **G.B. Bonan**, B.A. Boville, B.P. Briegleb, D.L. Williamson, and P.J. Rasch. 1996. Description of the NCAR Community Climate Model (CCM3). NCAR Technical Note NCAR/TN-420+STR. National Center for Atmospheric Research, Boulder, Colorado. 152 pp.

[8] Hartmann, D.L., A.K. Betts, **G.B. Bonan**, L.E. Branscome, A.J. Busalacchi, A. Lynch, S. Manabe, D.G. Martinson, R. Najjar, E.M. Rasmusson, A.R. Ravishankara, D.R. Sarewitz, D.J. Seidel, G.L. Stephens, L.D. Talley, J.M. Wallace, A.J. Weaver, S.C. Wofsy, and E.F. Wood. 2003. Understanding climate change feedbacks. The National Academies Press, Washington, D.C. 152 pp.

[9] Levis, S., **G.B. Bonan**, M. Vertenstein, and K.W. Oleson. 2004. The Community Land Model's dynamic global vegetation model (CLM-DGVM): Technical description and user's guide. NCAR Technical Note NCAR/TN-459+IA. National Center for Atmospheric Research, Boulder, Colorado. 50 pp.

[10] Oleson, K.W., Y. Dai, **G. Bonan**, M. Bosilovich, R. Dickinson, P. Dirmeyer, F. Hoffman, P. Houser, S. Levis, G.-Y. Niu, P. Thornton, M. Vertenstein, Z.-L. Yang, and X. Zeng. 2004. Technical description of the Community Land Model (CLM). NCAR Technical Note NCAR/TN-461+STR. National Center for Atmospheric Research, Boulder, Colorado. 173 pp.

[11] Oleson, K.W., D.M. Lawrence, **G.B. Bonan**, M.G. Flanner, E. Kluzek, P.J. Lawrence, S. Levis, S.C. Swenson, P.E. Thornton, A. Dai, M. Decker, R. Dickinson, J. Feddema, C.L. Heald, F. Hoffman, J.-F. Lamarque, N. Mahowald, G.-Y. Niu, T. Qian, J. Randerson, S. Running, K. Sakaguchi, A. Slater, R. Stöckli, A. Wang, Z.-L. Yang, X. Zeng, and X. Zeng. 2010. Technical description of version 4.0 of the Community Land Model (CLM). NCAR Technical Note NCAR/TN-478+STR. National Center for Atmospheric Research, Boulder, Colorado. 257 pp.

[12] Oleson, K.W., **G.B. Bonan**, J.J. Feddema, M. Vertenstein, and E. Kluzek. 2010. Technical description of an urban parameterization for the Community Land Model (CLMU). NCAR Technical Note NCAR/TN-480+STR. National Center for Atmospheric Research, Boulder, Colorado. 169 pp.

[13] Oleson, K.W., D.M. Lawrence, **G.B. Bonan**, B. Drewniak, M. Huang, C.D. Koven, S. Levis, F. Li, W.J. Riley, Z.M. Subin, S.C. Swenson, P.E. Thornton, A. Bozbiyik, R. Fisher, C.L. Heald, E. Kluzek, J.-F. Lamarque, P.J. Lawrence, L.R. Leung, W. Lipscomb, S. Muszala, D.M. Ricciuto, W. Sacks, Y. Sun, J. Tang, and Z.-L. Yang. 2013. Technical description of version 4.5 of the Community Land Model (CLM). NCAR Technical Note NCAR/TN-503+STR. National Center for Atmospheric Research, Boulder, Colorado. 420 pp.

[1] Shugart, H.H., **G.B. Bonan**, D.L. Urban, W.K. Lauenroth, W.J. Parton, and G.M. Hornberger. 1991. Computer models and long-term ecological research. pp. 211-239. In: P.G. Risser (ed) Long-Term Ecological Research: An International Perspective. SCOPE 47. John Wiley and Sons, Chichester.

[2] **Bonan, G.B.** 1992. Soil temperature as an ecological factor in boreal forests. pp. 126-143. In: H.H. Shugart, R. Leemans, and G.B. Bonan (eds) A Systems Analysis of the Global Boreal Forest. Cambridge University Press, Cambridge.

[3] **Bonan, G.B.** 1992. A simulation analysis of environmental factors and ecological processes in North American boreal forests. pp. 404-427. In: H.H. Shugart, R. Leemans, and G.B. Bonan (eds) A Systems Analysis of the Global Boreal Forest. Cambridge University Press, Cambridge.

[4] Smith, T.M., J.F. Weishampel, H.H. Shugart, and **G.B. Bonan**. 1992. The response of terrestrial C storage to climate change: Modeling C dynamics at varying temporal and spatial scales. pp. 307-326. In: J. Wisniewski and A.E. Lugo (eds) Natural Sinks of CO_2. Kluwer Academic Publishers, Dordrecht.

[5] Smith, T.M., H.H. Shugart, **G.B. Bonan**, and J.B. Smith. 1992. Modeling the potential response of vegetation to global climate change. pp. 93-116. In: F.I. Woodward (ed) Global Climate Change: The Ecological Consequences. Academic Press, London.

[6] Chapin, F.S. III, S.E. Hobbie, M.S. Bret-Harte, and **G.B. Bonan**. 1995. Causes and consequences of functional diversity in arctic systems. pp. 225-237. In: F.S. Chapin III and Ch. Körner (eds) Arctic and Alpine Biodiversity: Patterns, Causes and Ecosystem Consequences. Springer-Verlag, Berlin.

[7] **Bonan, G.B.** 1996. Taiga climate. pp. 738-741. In: S.H. Schneider (ed) Encyclopedia of Climate and Weather. Oxford University Press, New York.

[8] **Bonan, G.B.** 1998. Climate system models, land-atmosphere interactions. pp. 1209-1221. In: R.A. Meyers (ed) Encyclopedia of Environmental Analysis and Remediation. John Wiley and Sons, New York.

[9] **Bonan, G.B.** 2003. Processes determining land surface climate. pp. 135-140. In: T.D. Potter and B.R. Colman (eds) Handbook of Weather, Climate, and Water: Dynamics, Climate, Physical Meteorology, Weather Systems, and Measurements. John Wiley and Sons, Hoboken.

[10] **Bonan, G.B.**, R.S. DeFries, M.T. Coe, and D.S. Ojima. 2004. Land use and climate. pp. 301-314. In: G. Gutman, A.C. Janetos, C.O. Justice, E.F. Moran, J.F. Mustard, R.R. Rindfuss, D. Skole, B.L. Turner II, and M.A. Cochrane (eds) Land Change Science: Observing, Monitoring and Understanding Trajectories of Change on the Earth's Surface. Kluwer Academic Publishers, Dordrecht.

[11] **Bonan, G.B.** 2004. Biogeophysical feedbacks between land cover and climate. pp. 61-72. In: R.S. DeFries, G.P. Asner, and R.A. Houghton (eds) Ecosystems and Land Use Change. Geophysical Monograph 153. American Geophysical Union, Washington, D.C.

[12] **Bonan, G.B.** 2011. Taiga climate. pp. 139-144. In: S.H. Schneider, T.L. Root, and M.D. Mastrandrea (eds) Encyclopedia of Climate and Weather, Vol. 3 (2nd edition). Oxford University Press, New York.

[13] **Bonan, G.B.** 2011. Forests and global change. pp. 711-725. In: D.F. Levia, D. Carlyle-Moses, and T. Tanaka (eds) Forest Hydrology and Biogeochemistry: Synthesis of Past Research and Future Directions. Ecological Studies Series No. 216, Springer, Dordrecht.

CONFERENCE PROCEEDINGS AND NEWSLETTERS

[1] **Bonan, G.B.** 1991. The sensitivity of ecosystem CO_2 flux in the boreal forests of interior Alaska to climatic parameters. pp. 391-395. In: G. Weller, C.L. Wilson, and B.A.B. Severin (eds) International Conference on the Role of the Polar Regions in Global Change: Proceedings of a Conference Held June 11-15, 1990, at the University of Alaska Fairbanks. Volume II. Geophysical Institute, University of Alaska Fairbanks, Fairbanks, Alaska.

[2] **Bonan, G.B.** 1992. Some issues when remotely-sensing the carbon balance of forest ecosystems. pp. 1020-1022. In: Proceedings of the 12th Annual International Geoscience and Remote Sensing Symposium IGARSS '92. Volume II. Institute of Electrical and Electronics Engineers, Piscataway, New Jersey.

[3] **Bonan, G.B.** 1993. Boreal forests, the carbon cycle, and global change: A challenge for ecologists. pp. 139-153. In: Carbon Cycling in Boreal Forests and Sub-Arctic Ecosystems. Report EPA/600R-93/084. U.S. Environmental Protection Agency, Office of Research and Development, Washington, D.C.

[4] Oleson, K., **G. Bonan**, J. Feddema, and T. Jackson. 2009. Progress toward modeling global climate change in urban areas. pp. 8-12. In: Urban Climate News – Quarterly Newsletter of the International Association for Urban Climate. Issue No. 31 (March 2009). www.urban-climate.org

[5] Levis, S., P.E. Thornton, **G.B. Bonan**, and C.J. Kucharik. 2009. Modelling land use and land management with the Community Land Model. iLEAPS Newsletter Issue No. 7 (June 2009):10-12.

[6] **Bonan, G.B.**, and S. Levis. 2010. The ecological theory of climate models. iLEAPS Newsletter Issue No. 9 (April 2010):26-29.

[7] **Bonan, G.B.** 2010. Terrestrial feedbacks and Earth system models. iLEAPS Newsletter Issue No. 10 (November 2010):4-5.

[8] **Bonan, G.B.**, S. Levis, and W.R. Wieder. 2012. A modeller's perspective of long-term integrated data series of ecosystem-atmosphere processes. iLEAPS Newsletter Issue No. 12 (September 2012):6-9.

[9] **Bonan, G.B.**, and J.A. Santanello Jr. 2013. Bridging the gap between the iLEAPS and GEWEX land-surface modelling communities. iLEAPS Newsletter Issue No. 13 (April 2013):4.

[10] **Bonan, G.B.**, and J.A. Santanello Jr. 2013. Modelling the land-atmosphere interface across scales: from atmospheric science to Earth system science. iLEAPS Newsletter Issue No. 13 (April 2013):6-8.

PERSPECTIVES, NEWS & VIEWS, COMMENTARY

[1] **Bonan, G.B.** 2008. Carbon cycle: Fertilizing change. Nature Geoscience 1:645-646.

[2] **Bonan, G.** 2013. Canadian climate aberration. Nature Geoscience 6:21-22.

[3] **Bonan, G.B.** 2014. Connecting mathematical ecosystems, real-world ecosystems, and climate science. New Phytologist 202:731-733.

JOURNAL ARTICLES

1988

[1] **Bonan, G.B.** 1988. The size structure of theoretical plant populations: Spatial patterns and neighborhood effects. Ecology 69:1721-1730.

[2] Shugart, H.H., **G.B. Bonan**, and E.B. Rastetter. 1988. Niche theory and community organization. Canadian Journal of Botany 66:2634-2639.

1989

[3] **Bonan, G.B.** 1989. A computer model of the solar radiation, soil moisture, and soil thermal regimes in boreal forests. Ecological Modelling 45:275-306.

[4] **Bonan, G.B.** 1989. Environmental factors and ecological processes controlling vegetation patterns in boreal forests. Landscape Ecology 3:111-130.

[5] **Bonan, G.B.**, and H.H. Shugart. 1989. Environmental factors and ecological processes in boreal forests. Annual Review of Ecology and Systematics 20:1-28.

[6] **Bonan, G.B.**, and M.D. Korzuhin. 1989. Simulation of moss and tree dynamics in the boreal forests of interior Alaska. Vegetatio 84:31-44.

1990

[7] **Bonan, G.B.** 1990. Carbon and nitrogen cycling in North American boreal forests. I. Litter quality and soil thermal effects in interior Alaska. Biogeochemistry 10:1-28.

[8] **Bonan, G.B.** 1990. Carbon and nitrogen cycling in North American boreal forests. II. Biogeographic patterns. Canadian Journal of Forest Research 20:1077-1088.

[9] **Bonan, G.B.**, and B.P. Hayden. 1990. Using a forest stand simulation model to examine the ecological and climatic significance of the late-Quaternary pine-spruce pollen zone in Eastern Virginia, U.S.A. Quaternary Research 33:204-218.

[10] **Bonan, G.B.**, and B.P. Hayden. 1990. Forest vegetation structure on the Eastern Shore of Virginia circa 18,000 B.P. Virginia Journal of Science 41:307-320.

[11] **Bonan, G.B.**, H.H. Shugart, and D.L. Urban. 1990. The sensitivity of some high-latitude boreal forests to climatic parameters. Climatic Change 16:9-29.

1991

[12] **Bonan, G.B.** 1991. Atmosphere-biosphere exchange of carbon dioxide in boreal forests. Journal of Geophysical Research 96D:7301-7312.

[13] **Bonan, G.B.** 1991. A biophysical surface energy budget analysis of soil temperature in the boreal forests of interior Alaska. Water Resources Research 27:767-781.

[14] **Bonan, G.B.** 1991. Seasonal and annual carbon fluxes in a boreal forest landscape. Journal of Geophysical Research 96D:17,329-17,338.

[15] **Bonan, G.B.** 1991. Density effects on the size structure of annual plant populations: an indication of neighbourhood competition. Annals of Botany 68:341-347.

[16] Urban, D.L., **G.B. Bonan**, T.M. Smith, and H.H. Shugart. 1991. Spatial applications of gap models. Forest Ecology and Management 42:95-110.

1992

[17] **Bonan, G.B.** 1992. Comparison of atmospheric carbon dioxide concentration and metabolic activity in boreal forest ecosystems. Tellus B 44:173-185.

[18] **Bonan, G.B.**, D. Pollard, and S.L. Thompson. 1992. Effects of boreal forest vegetation on global climate. Nature 359:716-718.

[19] **Bonan, G.B.**, and L. Sirois. 1992. Air temperature, tree growth, and the northern and southern range limits to *Picea mariana*. Journal of Vegetation Science 3:495-506.

[20] **Bonan, G.B.**, and K. Van Cleve. 1992. Soil temperature, nitrogen mineralization, and carbon source-sink relationships in boreal forests. Canadian Journal of Forest Research 22:629-639.

[21] Smith, T.M., H.H. Shugart, **G.B. Bonan**, and J.B. Smith. 1992. Modeling the potential response of vegetation to global climate change. Advances in Ecological Research 22:93-116.

[22] Smith, T.M., J.F. Weishampel, H.H. Shugart, and **G.B. Bonan**. 1992. The response of terrestrial C storage to climate change: Modeling C dynamics at varying temporal and spatial scales. Water, Air, and Soil Pollution 64:307-326.

1993

[23] **Bonan, G.B.** 1993. Analysis of neighborhood competition among annual plants: Implications of a plant growth model. Ecological Modelling 65:123-136.

[24] **Bonan, G.B.** 1993. Importance of leaf area index and forest type when estimating photosynthesis in boreal forests. Remote Sensing of Environment 43:303-314.

[25] **Bonan, G.B.** 1993. Physiological controls of the carbon balance of boreal forest ecosystems. Canadian Journal of Forest Research 23:1453-1471.

[26] **Bonan, G.B.** 1993. Physiological derivation of the observed relationship between net primary production and mean annual air temperature. Tellus B 45:397-408.

[27] **Bonan, G.B.** 1993. Do biophysics and physiology matter in ecosystem models? Climatic Change 24:281-285.

[28] **Bonan, G.B.**, D. Pollard, and S.L. Thompson. 1993. Influence of subgrid-scale heterogeneity in leaf area index, stomatal resistance, and soil moisture on grid-scale land-atmosphere interactions. Journal of Climate 6:1882-1897.

1994

[29] **Bonan, G.B.** 1994. Comparison of the land surface climatology of the National Center for Atmospheric Research community climate model 2 at R15 and T42 resolutions. Journal of Geophysical Research 99D:10357-10364.

[30] **Bonan, G.B.** 1994. Comparison of two land surface process models using prescribed forcings. Journal of Geophysical Research 99D:25803-25818.

[31] Sirois, L., **G.B. Bonan**, and H.H. Shugart. 1994. Development of a simulation model of the forest-tundra transition zone of northeastern Canada. Canadian Journal of Forest Research 24:697-706.

[32] Way, J.B., E.J.M. Rignot, K.C. McDonald, R. Oren, R. Kwok, **G. Bonan**, M.C. Dobson, L.A. Viereck, and J.E. Roth. 1994. Evaluating the type and state of Alaska taiga forests with imaging radar for use in ecosystem models. IEEE Transactions on Geoscience and Remote Sensing 32:353-370.

1995

[33] **Bonan, G.B.** 1995. Land-atmosphere CO_2 exchange simulated by a land surface process model coupled to an atmospheric general circulation model. Journal of Geophysical Research 100D:2817-2831.

[34] **Bonan, G.B.** 1995. Land-atmosphere interactions for climate system models: Coupling biophysical, biogeochemical, and ecosystem dynamical processes. Remote Sensing of Environment 51:57-73.

[35] **Bonan, G.B.** 1995. Sensitivity of a GCM simulation to inclusion of inland water surfaces. Journal of Climate 8:2691-2704.

[36] **Bonan, G.B.**, F.S. Chapin III, and S.L. Thompson. 1995. Boreal forest and tundra ecosystems as components of the climate system. Climatic Change 29:145-167.

1996

[37] **Bonan, G.B.** 1996. Sensitivity of a GCM simulation to subgrid infiltration and surface runoff. Climate Dynamics 12:279-285.

[38] Kutzbach, J., **G. Bonan**, J. Foley, and S.P. Harrison. 1996. Vegetation and soil feedbacks on the response of the African monsoon to orbital forcing in the early to middle Holocene. Nature 384:623-626.

1997

[39] **Bonan, G.B.** 1997. Effects of land use on the climate of the United States. Climatic Change 37:449-486.

[40] **Bonan, G.B.**, K.J. Davis, D. Baldocchi, D. Fitzjarrald, and H. Neumann. 1997. Comparison of the NCAR LSM1 land surface model with BOREAS aspen and jack pine tower fluxes. Journal of Geophysical Research 102D:29065-29075.

[41] Coe, M.T., and **G.B. Bonan**. 1997. Feedbacks between climate and surface water in northern Africa during the middle Holocene. Journal of Geophysical Research 102D:11087-11101.

[42] Peylin, P., J. Polcher, **G. Bonan**, D.L. Williamson, and K. Laval. 1997. Comparison of two complex land surface schemes coupled to the National Center for Atmospheric Research general circulation model. Journal of Geophysical Research 102D:19413-19431.

1998

[43] **Bonan, G.B.** 1998. The land surface climatology of the NCAR land surface model coupled to the NCAR Community Climate Model. Journal of Climate 11:1307-1326.

[44] **Bonan, G.B.**, and L.M. Stillwell-Soller. 1998. Soil water and the persistence of floods and droughts in the Mississippi River Basin. Water Resources Research 34:2693-2701.

[45] Craig, S.G., K.J. Holmén, **G.B. Bonan**, and P.J. Rasch. 1998. Atmospheric CO_2 simulated by the National Center for Atmospheric Research Community Climate Model 1. Mean fields and seasonal cycles. Journal of Geophysical Research 103D: 13213-13235.

[46] Kiehl, J.T., J.J. Hack, **G.B. Bonan**, B.B. Boville, D.L. Williamson, and P.J. Rasch. 1998. The National Center for Atmospheric Research Community Climate Model: CCM3. Journal of Climate 11:1131-1149.

1999

[47] **Bonan, G.B.** 1999. Frost followed the plow: Impacts of deforestation on the climate of the United States. Ecological Applications 9:1305-1315.

[48] Lynch, A.H., **G.B. Bonan**, F.S. Chapin III, and W. Wu. 1999. The impact of tundra ecosystems on the surface energy budget and climate of Alaska. Journal of Geophysical Research 104D:6647-6660.

2000

[49] **Bonan, G.B.** 2000. The microclimates of a suburban Colorado (USA) landscape and implications for planning and design. Landscape and Urban Planning 49:97-114.

[50] Oleson, K., and **G.B. Bonan**. 2000. The effects of remotely-sensed plant functional type and leaf area index on simulations of boreal forest surface fluxes by the NCAR land surface model. Journal of Hydrometeorology 1:431-446.

2001

[51] **Bonan, G.B.** 2001. Observational evidence for reduction of daily maximum temperature by croplands in the Midwest United States. Journal of Climate 14:2430-2442.

[52] Beringer, J., A.H. Lynch, F.S. Chapin III, M. Mack, and **G.B. Bonan**. 2001. The representation of Arctic soils in the land surface model: the importance of mosses. Journal of Climate 14:3324-3335.

[53] Blackmon, M., B. Boville, F. Bryan, R. Dickinson, P. Gent, J. Kiehl, D. Moritz, D. Randall, J. Shukla, S. Solomon, **G. Bonan**, S. Doney, I. Fung, J. Hack, E. Hunke, J. Hurrell, J. Kutzbach, J. Meehl, B. Otto-Bliesner, R. Saravanan, E.K. Schneider, L. Sloan, M. Spall, K. Taylor, J. Tribbia, and W. Washington. 2001. The Community Climate System Model. Bulletin of the American Meteorological Society 82:2357-2376.

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[138] **Bonan, G.B.**, and S.C. Doney. 2018. Climate, ecosystems, and planetary futures: The challenge to predict life in Earth system models. Science 359, eaam8328, doi:10.1126/science.aam8328.

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[143] Lombardozzi, D.L., N.G. Smith, S.J. Cheng, J.S. Dukes, T.D. Sharkey, A. Rogers, R. Fisher, and **G.B. Bonan**. 2018. Triose phosphate limitation in photosynthesis models reduces leaf photosynthesis and global terrestrial carbon storage. Environmental Research Letters 13, 074025, doi:10.1088/1748-9326/aacf68.

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[145] Franks, P.J., **G.B. Bonan**, J.A. Berry, D.L. Lombardozzi, N.M. Holbrook, N. Herold, and K.W. Oleson. 2018. Comparing optimal and empirical stomatal conductance models for application in Earth system models. Global Change Biology 24:5708-5723.

[146] Lombardozzi, D.L., **G.B. Bonan**, W. Wieder, A.S. Grandy, C. Morris, and D.L. Lawrence. 2018. Cover crops may cause winter warming in snow-covered regions. Geophysical Research Letters, 45, 9889-9897, https://doi.org/10.1029/2018GL079000.

2019

[147] **Bonan G.B.**, D.L. Lombardozzi, W.R. Wieder, K.W. Oleson, D.M. Lawrence, F.M. Hoffman, and N. Collier. 2019. Model structure and climate data uncertainty in historical simulations of the terrestrial carbon cycle (1850–2014). Global Biogeochemical Cycles, 33, 1310–1326, https://doi.org/10.1029/2019GB006175.

[148] Laguë, M.M., **G.B. Bonan**, and A.L.S. Swann. 2019. Separating the impact of individual land surface properties on the terrestrial surface energy budget in both the coupled and uncoupled land-atmosphere system. Journal of Climate, 32, 5725–5744, doi:10.1175/JCLI-D-18-0812.1.

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[151] Burakowski, E.A., A. Tawfik, A. Ouimette, L. Lepine, C. Zarzycki, K. Novick, S. Ollinger, and **G. Bonan**. 2019. Simulating surface energy fluxes using the variable-resolution Community Earth System Model (VR-CESM). Theoretical and Applied Climatology 138:115-133, https://doi.org/10.1007/s00704-019-02785-0.

[152] Lawrence, D.M., R.A. Fisher, C.D. Koven, K.W. Oleson, S.C. Swenson, **G. Bonan**, N. Collier, B. Ghimire, L. van Kampenhout, D. Kennedy, E. Kluzek, P.J. Lawrence, F. Li, H. Li, D. Lombardozzi, W.J. Riley, W.J. Sacks, M. Shi, M. Vertenstein, W.R. Wieder, C. Xu, A.A. Ali, A.M. Badger, G. Bisht, M. van den Broeke, M.A. Brunke, S.P. Burns, J. Buzan, M. Clark, A. Craig, K. Dahlin, B. Drewniak, J.B. Fisher, M. Flanner, A.M. Fox, P. Gentine, F. Hoffman, G. Keppel-Aleks, R. Knox, S. Kumar, J. Lenaerts, L.R. Leung, W.H. Lipscomb, Y. Lu, A. Pandey, J.D. Pelletier, J. Perket, J.T. Randerson, D.M. Ricciuto, B.M. Sanderson, A. Slater, Z.M. Subin, J. Tang, R.Q. Thomas, M. Val Martin, and X. Zeng. 2019. The Community Land Model version 5: Description of new features, benchmarking, and impact of forcing uncertainty. Journal of Advances in Modeling Earth Systems 11, 4245–4287, https://doi.org/10.1029/2018MS001583.

2020

[153] Wozniak, M.C., **G.B. Bonan**, G. Keppel-Aleks, and A.L. Steiner. 2020. Influence of vertical heterogeneities in the canopy microenvironment on inter-annual variability of carbon uptake in temperate deciduous forests. Journal of Geophysical Research: Biogeosciences, doi:10.1029/2020JG005658.

2021

[154] **Bonan, G.B.**, D.L. Lombardozzi, and W.R. Wieder. 2021. The signature of internal variability in the terrestrial carbon cycle. Environmental Research Letters 16, 034002, doi:10.1088/1748-9326/abd6a9.

[155] **Bonan**, G.B., E.G. Patton, J.J. Finnigan, D.D. Baldocchi, and I.N. Harman. 2021. Moving beyond the incorrect but useful paradigm: reevaluating big-leaf and multilayer plant canopies to model biosphere-atmosphere fluxes – a review. Agricultural and Forest Meteorology, 306, https://doi.org/10.1016/j.agrformet.2021.108435.

2022

[156] Kyker-Snowman, E., D.L. Lombardozzi, **G.B. Bonan**, S.J. Cheng, J.S. Dukes, S.D. Frey, E.M. Jacobs, R. McNellis, J.M. Rady, N.G. Smith, R.Q. Thomas, W.R. Wieder, and A.S. Grandy. 2022. Increasing the spatial and temporal impact of ecological research: A roadmap for integrating a novel terrestrial process into an Earth system model. Global Change Biology, 28, 665–684.

[157] Meier, R., E.L. Davin, **G.B. Bonan**, D.M. Lawrence, X. Hu, G. Duveiller, C. Prigent, and S.I. Seneviratne. 2022. Impacts of a revised surface roughness parameterization in the Community Land Model 5.1. Geoscientific Model Development, 15, 2365–2393.

STUDENT VISITORS, POST-DOCTORAL VISITORS, AND SUPPORT SCIENTISTS SUPERVISED

SOARS (SIGNIFICANT OPPORTUNITIES IN ATMOSPHERIC RESEARCH AND SCIENCE) UNDERGRADUATES

Graylen Boone, North Carolina State University, Meteorology (2011)

Andre Perkins, University of Wisconsin, Atmospheric and Oceanic Science/Computer Science (2011)

Stone Abdullah, Jackson State University, Earth System Science (2013)

Gabriela De La Cruz Tello, San Jose State University, Meteorology (2013)

THESIS COMMITTEES

Andrew Slater, Ph.D., 2003, Environmental Studies Program, University of Colorado (Amanda Lynch, advisor)

Inge Juszak, Ph.D., 2016, Department of Evolutionary Biology and Environmental Studies, University of Zurich (Michael Schaepman, chair) [external assessment]

Marysa Laguë, Ph.D. 2019, Department of Atmospheric Sciences, University of Washington (Abigail Swann, advisor)

Emily Kyker-Snowman, Ph.D., 2021, Natural Resources and Earth System Science, University of New Hampshire (Stuart Grandy, advisor)

GRADUATE STUDENT VISITORS
(numbers denote peer-reviewed journal articles in which the student was first author)

Phillipe Peylin, 1995, Laboratoire de Météorologie Dynamique du CNRS [42]

Michael Coe, Ph.D., 1997, Department of Atmospheric and Oceanic Sciences, University of Wisconsin (John Kutzbach, advisor) [41]

Steve Craig, Ph.D., 1998, Department of Meteorology, Stockholm University (Kim Holmén, advisor) [45]

Ben Cook, Ph.D., 2007, Department of Environmental Sciences, University of Virginia (Howard Epstein, advisor) [72, 82, 83]

Maria Malene Kvalevåg, Ph.D., 2009, Department of Geosciences, University of Oslo (Gunnar Myhre, advisor) [92]

Abigail Swann, Ph.D., 2010, Earth and Planetary Science, University of California, Berkeley (Inez Fung, advisor) [91]

Danica Lombardozzi, Ph.D., 2012, Department of Ecology and Evolutionary Biology, Cornell University (Jed Sparks, advisor) [106, 107, 115]

R. Quinn Thomas, Ph.D., 2012, Department of Ecology and Evolutionary Biology, Cornell University (Christine Goodale, advisor) [110]

Brendan Rogers, Ph.D., 2014, Earth System Science Department, University of California, Irvine (James Randerson, advisor) [109]

Nicholas Smith, Ph.D., 2016, Department of Biological Sciences, Purdue University (Jeffrey Dukes, advisor) [126, 135]

Marysa Laguë, Ph.D. 2019, Department of Atmospheric Sciences, University of Washington (Abigail Swann, advisor) [148]

POST-DOCTORAL VISITORS

William Wieder, (Ph.D., 2011, Department of Ecology and Evolutionary Biology, University of Colorado, Boulder), 2011-2014

Danica Lombardozzi, (Ph.D., 2012, Department of Ecology and Evolutionary Biology, Cornell University), 2012-2015

R. Quinn Thomas, (Ph.D., 2012, Department of Ecology and Evolutionary Biology, Cornell University), 2012-2013

Elizabeth Burakowski, (Ph.D., 2013, Natural Resources and Earth Systems Science, University of New Hampshire), 2014-2016

NCAR SUPPORT SCIENTISTS

Lana Stillwell-Soller, Associate Scientist II (1997)

Samuel Levis, Project Scientist III (1999-2015)

Keith Oleson, Project Scientist III (1999-present)

Peter Lawrence, Project Scientist I (2008-2015)

Melannie Hartman, Visitor/Casual Associate Scientist II (2011-2020)

William Wieder, Project Scientist II (2014-present)

Danica Lombardozzi, Project Scientist II (2015-present)

Sean Burns, Associate Scientist III (2017-present)

Jacquelyn Shuman, Project Scientist II (2018-present)

TEACHING

Associate Professor Adjoint, Program in Atmospheric and Oceanic Sciences, University of Colorado, Boulder, Colorado, 1999-2003

ATOC 1060 – "Our Changing Environment," Program in Atmospheric and Oceanic Sciences, University of Colorado, Boulder, Colorado, spring 2000. This was a large (~150 students) introductory class on climatology for non-science majors.

FUNDING

Thompson, S. (PI) "Modeling trace gas processes in soils for coupling to global climate models." Environmental Protection Agency (EPA IAG DW49934780-01-0), $50,000 subcontract, FY92.

Smith, T. (PI) and H.H. Shugart (Co-PI) "Modelling the dynamics of global terrestrial carbon storage under changing environmental conditions." Department of Energy (DE-FG03-90ER61010), $47,000 subcontract, FY92.

Chapin, F.S. III (PI) "Interactions of arctic ecosystems with regional and global climate." National Science Foundation, $74,365 subcontract, FY93-FY96.

Bonan, G.B. (PI) "Estimating regional biosphere-atmosphere exchange of carbon dioxide and water in boreal forest ecosystems." Environmental Protection Agency (EPA IAG DW49936408-01-0), $55,000, FY95.

Bonan, G.B. (PI) "Coupled climate modeling of the Arctic region: land component." Geophysical Institute, University of Alaska, $15,000, April 1995.

Bonan, G.B. (PI) "Estimating regional biosphere-atmosphere exchange of carbon dioxide and water in boreal forest ecosystems." National Aeronautics and Space Administration, $64,000, FY97.

Foley, J.A. (PI) "Methods and models for evaluating vegetation feedbacks on the climate system." National Science Foundation, $30,000 subcontract, FY98-00.

Lynch, A.H. (PI) and M.C. Serreze (Co-PI) "Transitions: a study of spatial and temporal transitions of climate and ecosystems in the circumpolar Arctic." National Science Foundation, $26,811 subcontract, FY98-02.

Bonan, G.B. (PI) "Effects of boreal forest and tundra ecosystems on global climate." National Aeronautics and Space Administration, $214,700, FY98-00.

Bonan, G.B. (PI) "Effects of land-use on climate and water resources." National Aeronautics and Space Administration, $529,300, FY00-03.

Bonan, G. (PI) and E.A. Holland (co-PI) "Collaborative research: ETBC – The cycling of nitrogen in an earth system model: Constraints and implications for climate change." National Science Foundation (AGS-1020767), $425,726, 10/1/10 – 9/30/14.

Bonan, G. (PI) and C.L. Goodale and D.W. Nychka (co-PIs) "Type 1 - L02170320: Assessing and improving the scale dependence of ecosystem processes in earth system models." National Science Foundation (EF-1048481), $896,674, 5/1/11 – 4/30/14.

Lindsay, K. (PI) and D. Lawrence and G. Bonan (co-PIs) "Collaborative research: Improved regional and decadal predictions of the carbon cycle." National Science Foundation (AGS-1048996), $599,338, 4/1/11 – 3/31/15.

Randall, D. (PI) and W. Schubert, C.H. Moeng, J. Helly, and A.S. Denning (co-PI) "Center for Multi-Scale Modeling of Atmospheric Processes (MMAP)." National Science Foundation, $404,460 subcontract, 7/1/11 – 6/30/16.

Wieder, W.R. (PI) and G.B. Bonan (co-PI) "Evaluating soil biogeochemistry models and soil carbon storage with data from continental scales." US Geological Survey (G13AC00350), $69,856, 9/1/13 – 12/31/17.

Thomas, R.Q. (PI) and G.B. Bonan, H. Burkhart, J. Dukes, T.R. Fox, S. Frey, C.L. Goodale, S. Grandy, and J.P. Sparks (co-PIs) "Decadal prediction of sustainable agricultural and forest management – Earth system prediction differs from climate prediction." National Institute of Food and Agriculture/U.S. Department of Agriculture (2015-67003-23485), $2,569,544 [$888,727 subcontract], 5/15/15 – 5/14/21.

Bonan, G.B. (PI) and Wieder, W.R. (co-PI) "Closing the terrestrial nitrogen cycle in the Community Land Model to evaluate carbon cycle and environmental consequences of reactive nitrogen." Environmental Protection Agency. $150,000. 1/1/16 – 12/31/16

Bonan, G.B. (PI) and Michael SanClements, David Durden, and Dawn Lenz (co-PIs) "Data CI Pilot: NCAR and NEON cyberinfrastructure collaborations to enable convergence research linking the atmospheric and biological sciences." National Science Foundation (2039932), $599,996, 11/1/20 – 10/31/21.

PRESENTATIONS (SINCE 2001)

1. "Climate impacts of land cover change from CCM-LSM," 1999 AGU Fall Meeting, San Francisco, CA, 16 December 1999
2. Department of Atmospheric Science, Colorado State University, Fort Collins, CO, April 2001
3. "Land use and land cover change," U.S. Workshop on "Climate Projections, Uncertainty, and Scenarios for Impacts Assessment," NCAR, Boulder, CO, July 2002
4. "Effects of land cover and land use change on climate," AGU Chapman Conference on "Ecosystems Interactions with Land Use Change," Santa Fe, NM, June 2003
5. "Impacts of future land use on climate," National Academy of Sciences committee on "Radiative Forcing Effects on Climate," Boulder, CO, 10 March 2004
6. "The greening of land surface models (or, what we have learned about climate-vegetation interactions during ten years of CCSM)," Community Climate System Model plenary session, Breckenridge, CO, 22 June 2005
7. University of Wyoming Distinguished Lecturer Series in Ecology: (a) "How vegetation affects weather and climate," (b) "The greening of climate models and their application to understand the role of terrestrial vegetation in the climate system," and (c) "An introduction to land surface models for climate models," University of Wyoming, Laramie, WY, October 2005
8. "The greening of land surface models: the next generation of models and lessons learned for climate and vegetation interactions," 2005 AGU Fall Meeting, San Francisco, CA, 7 December 2005
9. "Land surface models for climate models: description and application," Advance Study Program colloquium on "The Art of Climate Models," NCAR, Boulder, CO, June 2006
10. "Snow cover fraction: fact, fantasy, and importance for climate simulation," Hydrology seminar, Ralph Parsons Lab, MIT, Cambridge, MA, 15 March 2007
11. "The greening of climate models and their applications to understand the role of terrestrial vegetation in the climate system – or, what have climate models taught us about ecology," Advance Study Program colloquium on "Regional Biogeochemistry," NCAR, Boulder, CO, 5 June 2007
12. "Do mid-latitude croplands cool climate?," NSF workshop on "Detecting the Atmospheric Response to the Changing Face of the Earth: A Focus on Human-Caused Regional Climate Forcings, Land-Cover/Land-Use Change, and Data Monitoring," Boulder, CO, 27 August 2007

13. “Terrestrial ecosystem forcings and feedbacks in the climate system,” Sixth University of Washington Program on Climate Change Summer Institute on “Couplings between Changes in the Climate System and Biogeochemistry,” Friday Harbor Laboratories, San Juan Island, WA, 13 September 2007
14. “Revisiting the meteorologically utopian city in a changing climate,” Institute of Urban and Regional Development and Department of City and Regional Planning, University of California Berkeley, Berkeley, CA, 15 November 2007
15. “Contrasting impacts of deforestation in temperate and boreal regions from global and mesoscale simulations,” National Center for Ecological Analysis and Synthesis working group on “Terrestrial Ecosystems and Climate Policy,” Santa Barbara, CA, 22 January 2008
16. “Advances in land-climate interactions for earth system models: the Community Land Model (CLM) experience,” EGU General Assembly 2008, Vienna, Austria, 14 April 2008
17. “The land use forcing of climate: models, observations, and research needs,” Ameriflux science team meeting, Boulder, CO, 17 October 2008
18. “Forests and climate change: forcings, feedbacks, and the climate benefits of forests,” Geography Department, University of Denver, Denver, CO, 13 November 2008
19. “Global land cover change experiments – the LUCID intercomparison,” National Center for Ecological Analysis and Synthesis working group on “Terrestrial Ecosystems and Climate Policy,” Santa Barbara, CA, 27 January 2009
20. “FLUXNET data and land surface models for climate simulation,” FLUXNET Asilomar modeling workshop, Pacific Grove, CA, 11 February 2009
21. “Climate change mitigation through ecosystem management – fact, fantasy, and possibility,” Department of Atmospheric Sciences, University of Illinois, Urbana, IL, 25 February 2009
22. “Climate change mitigation through ecosystem management,” Center on Global Change, Duke University, Durham, NC, 19 March 2009
23. “CCSM Community Land Model developments for AR5,” Center for Multiscale Modeling of Atmospheric Processes, Colorado State University, Fort Collins, CO, 28 July 2009
24. “The terrestrial carbon cycle and land cover change in the Community Climate System Model,” CSIRO Marine and Atmospheric Research, Aspendale, Australia, 21 August 2009
25. “The ecological theory of climate models,” 2nd Integrated Land Ecosystem-Atmosphere Processes Study (iLEAPS) science conference, Melbourne, Australia, 24 August 2009
26. “Climate forcing and feedback from the terrestrial carbon cycle and land cover change,” Department of Environmental Sciences, University of Virginia, Charlottesville, VA, 19 January 2010
27. “Climate forcing and feedback from the terrestrial carbon cycle and land cover change,” Biogeochemistry and Environmental Biocomplexity, Cornell University, Ithaca, NY, 19 February 2010
28. “Co-evolution of climate and life,” Center for Astrobiology, University of Colorado, Boulder, CO, 20 October 2010
29. “Nitrogen and climate,” American Meteorological Society Climate Briefing Series on “The Role of Nitrogen in Global Change,” Russell Senate Office Building, Washington, DC, 19 November 2010
30. “Modeling feedbacks and interactions between the land, climate, and human systems in the Community Land Model (CLM4): Successes and further research needs,” 2010 AGU Fall Meeting, San Francisco, CA, 15 December 2010

31. “Modeling the integrated ecology, biogeochemistry, and hydrology of the global terrestrial biosphere in the Community Land Model (CLM4),” 2010 AGU Fall Meeting, San Francisco, CA, 17 December 2010

32. “The integrated ecology, biogeochemistry, and hydrology of the terrestrial biosphere – an earth system model perspective,” 1st INTERFACE Meeting: “How Do We Improve Earth System Models: Integrating Earth System Models, Ecosystem Models, Experiments and Long-Term Data,” Captiva Island, FL, 1 March 2011

33. “Improving canopy processes in the Community Land Model using FLUXNET data: assessing nitrogen limitation and canopy optimization,” 3rd Integrated Land Ecosystem-Atmosphere Processes Study (iLEAPS) science conference, Garmisch-Partenkirchen, Germany, 21 September 2011 [contributed]

34. “Land cover and land use change as climate forcing: from historical conjecture to modern theories,” World Climate Research Programme open science conference, Denver, CO, 27 October 2011

35. “Reconciling leaf physiological traits and canopy-scale flux data: Use of the TRY and FLUXNET databases in the Community Land Model,” 2011 AGU Fall Meeting, San Francisco, CA, 6 December 2011

36. “From climate models to earth system models: the stomatal paradigm and beyond,” Academy Colloquium: “Stomatal Conductance Through Time: Towards Accurate Estimates of Physiological CO_2 -Forcing of the Climate,” Royal Netherlands Academy of Arts and Sciences, Amsterdam, 18 September 2012

37. “Ecosystem feedbacks in a 21st century climate: carbon, nitrogen, and land cover change,” Fall Environmental Sciences Seminar Series, University of New Hampshire, Durham, NH, 19 October 2012

38. “Evaluating litter decomposition and soil organic matter dynamics in earth system models: Contrasting analysis of long-term litter decomposition and steady-state soil carbon,” 2012 AGU Fall Meeting, San Francisco, CA, 3 December 2012

39. “Modeling terrestrial ecosystems: characterization of the terrestrial environment,” Advanced Study Program Summer Colloquium 2013: “Carbon-climate connections in the Earth system,” National Center for Atmospheric Research, Boulder, CO, 30 July 2013

40. “Modeling terrestrial ecosystems: biogeophysics & canopy processes,” Advanced Study Program Summer Colloquium 2013: “Carbon-climate connections in the Earth system,” National Center for Atmospheric Research, Boulder, CO, 30 July 2013

41. “Can the Earth system be managed for planetary sustainability: the missing ecology and hydrology of climate science,” Department of Environmental Sciences, University of Virginia, Charlottesville, VA, 5 December 2013

42. “A new stomatal paradigm for earth system models?”, 2013 AGU Fall Meeting, San Francisco, CA, 10 December 2013

43. “Modeling terrestrial ecosystems: biosphere–atmosphere interactions,” Community Land Model Tutorial, National Center for Atmospheric Research, Boulder, CO, 18 February 2014

44. “Modeling terrestrial ecosystems: biogeophysics & canopy processes,” Community Land Model Tutorial, National Center for Atmospheric Research, Boulder, CO, 18 February 2014

45. “Issues, challenges, and opportunities of carbon cycle modeling in ESMs,” Workshop on “Representing soil carbon dynamics in global land models to improve future IPCC assessments,” Breckenridge, CO, 12 June 2014

46. “Connecting mathematical ecosystems, real-world ecosystems, and climate science,” Berkeley Atmospheric Sciences Center, University of California Berkeley, Berkeley, CA, 8 April 2015

47. “Canopy processes in the Community Land Model,” 20th Annual CESM Workshop, Breckenridge, CO, 17 June 2015
48. “Connecting mathematical ecosystems, real-world ecosystems, and climate science,” Ecological Society of America Annual Meeting 2015, Baltimore, MD, 14 August 2015
49. “Forests, climate, and public policy: a 500-year interdisciplinary odyssey,” 14th University of Washington Program on Climate Change Summer Institute on “Terrestrial Ecosystems, Land Surface, and Climate Change,” Friday Harbor Laboratories, San Juan Island, WA, 20 September 2015
50. “Chasing perfection: should we reduce model uncertainty in carbon cycle-climate feedbacks?” 2015 AGU Fall Meeting, San Francisco, CA, 15 December 2015
51. “Land management for climate change mitigation and geoengineering - are Earth system models up to the challenge?” 2015 AGU Fall Meeting, San Francisco, CA, 16 December 2015
52. “Biosphere–atmosphere interactions in Earth system models,” Community Land Model Tutorial, National Center for Atmospheric Research, Boulder, CO, 12 September 2016
53. “Modeling terrestrial ecosystems: biogeophysics & canopy processes,” Community Land Model Tutorial, National Center for Atmospheric Research, Boulder, CO, 12 September 2016
54. “Air quality and chemistry-climate interactions: emerging research in land surface models,” 15th Annual CMAS Conference, University of North Carolina-Chapel Hill, Chapel Hill, NC, 24 October 2016
55. “Stomatal conductance, plant hydraulics, and multilayer canopies: a new paradigm for Earth system models or unnecessary uncertainty,” 2016 AGU Fall Meeting, San Francisco, CA, 12 December 2016
56. “Deforestation, land use, and climate in colonial America: lessons from America’s first climate change debate,” 97th AMS Annual Meeting, Seattle, WA, 24 January 2017
57. “Forests, climate, and public policy: a 500-year interdisciplinary odyssey,” AAAS 2017 Annual Meeting, Boston, MA, 17 February 2017
58. “Modeling canopy-induced turbulence in the Earth system: a unified parameterization of turbulent exchange within plant canopies and the roughness sublayer,” CESM Land Model Working Group, Boulder, CO, 2 March 2017
59. “Seeing the forest for trees: has biology improved climate models?” Department of Atmospheric Sciences, University of Washington, Seattle, WA, 5 May 2017
60. “Reducing uncertainty in Earth system model terrestrial carbon cycle projections – the Community Land Model experience,” 2017 AGU Fall Meeting, New Orleans, LA, 13 December 2017
61. “32 years after the Simple Biosphere Model (SiB): Is the biosphere still simple to model?” 98th AMS Annual Meeting, Austin, TX, 11 January 2018
62. “Assessing uncertainty in the terrestrial carbon cycle: an analysis of historical simulations with the Community Land Model,” 15th Annual Meeting Asia Oceania Geosciences Society, Honolulu, HI, 07 June 2018
63. “From leaf to canopy to global: using flux data to test and improve terrestrial biosphere models across scales,” 2018 AmeriFlux PI Meeting, Bloomington, IN, 24 October 2018
64. “From geophysical fluid dynamics to terrestrial ecosystems: the convergent science of climate and ecology,” 2018 AGU Fall Meeting, Washington, DC, 13 December 2018
65. “Sources of uncertainty in historical simulations of the terrestrial carbon cycle (1850-2014),” 2018 AGU Fall Meeting, Washington, DC, 13 December 2018

66. “Modeling the biosphere in 2050: successes and failures, consensus and controversies,” 99th AMS Annual Meeting, Inez Fung Symposium, Phoenix, AZ, 8 January 2019
67. “Biosphere-atmosphere interactions in Earth system models,” 3rd Community Land Model (CLM) tutorial, National Center for Atmospheric Research, Boulder, CO, 4 February 2019
68. “Modeling terrestrial ecosystems: biogeophysics & canopy processes,” 3rd Community Land Model (CLM) tutorial, National Center for Atmospheric Research, Boulder, CO, 5 February 2019
69. “Model structure and climate data uncertainty in historical simulations of the terrestrial carbon cycle (1850-2014),” Community Earth System Model (CESM) Land Model Working Group Meeting, Boulder, CO, 11 February 2019
70. “Modeling the biosphere in 2050: successes and failures, consensus and controversies (v2),” Community Earth System Model (CESM) Land Model Working Group Meeting, Boulder, CO, 11 February 2019
71. “Reinventing nature: environmental stewardship in the age of Earth system models,” Northern Arizona University, Flagstaff, AZ, 22 April 2019
72. “Biosphere-atmosphere interactions in Earth system models,” Fluxcourse 2019, University of Colorado Mountain Research Station, Nederland, CO, 23 July 2019
73. “Modeling the terrestrial biosphere in the Earth system: moving beyond the incorrect but useful paradigm,” Environmental Science and Engineering, California Institute of Technology, Pasadena, CA, 16 October 2019
74. “Modeling the terrestrial biosphere in the Earth system: moving beyond the incorrect but useful paradigm,” Department of Global Ecology, Carnegie Institution for Science, Stanford, CA, 12 November 2019
75. “Modeling plant canopies in the Earth system: moving beyond the big-leaf paradigm to multilayered canopies,” 2019 AGU Fall Meeting, San Francisco, CA, 11 December 2019
76. “The signature of atmospheric internal variability on the terrestrial carbon cycle,” 100th AMS Annual Meeting, Boston, MA, 13 January 2020
77. “From atmospheric sciences to ecology: building an interdisciplinary view of climate,” 100th AMS Annual Meeting, Robert Dickinson Symposium, Boston, MA, 14 January 2020
78. “Moving beyond the incorrect but useful paradigm: reevaluating big-leaf and multilayer plant canopies to model biosphere-atmosphere fluxes – a review,” Community Earth System Model (CESM) Land Model Working Group Meeting, Boulder, CO, 5 March 2020
79. “Reinventing nature: environmental stewardship in the age of Earth system models,” CSDMS 2020 – Linking Ecosphere and Geosphere, University of Colorado, Boulder, CO, 21 May 2020 (virtual)
80. “Seeing the forest for the trees: forests, climate change, and our future,” Tyndall History of Global Environmental Change Lecture, 2020 AGU Fall Meeting (virtual), 8 December 2020
81. “Moving beyond the incorrect but useful paradigm: re-envisioning forests in Earth system models,” 2020 AGU Fall Meeting (virtual), 9 December 2020
82. “Chasing perfection: can we reduce model uncertainty in carbon cycle-climate feedbacks?” Hydrology & Atmospheric Sciences, University of Arizona, Tucson, AZ, 22 April 2021 (virtual)
83. “Chasing perfection: can we reduce model uncertainty in carbon cycle-climate feedbacks?” Atmospheric & Environmental Chemistry, Harvard University, Cambridge, MA, 3 September 2021 (virtual)
84. “Deforesting the world: a difficult conversation in Earth system science,” CGD Exchange, NCAR, Boulder, CO, 18 November 2021 (virtual)

85. “The internal variability of the terrestrial carbon cycle,” 2021 AGU Fall Meeting, 16 December 2021 (virtual)
86. “Where are the leaves and plants? The status of physiological ecology in Earth system models,” 2021 AGU Fall Meeting, 16 December 2021 (virtual)
87. “Simulating forest microclimates in an Earth system model,” project meeting MaCCMic: Impact of forest management and climate change on understory microclimate, INRAE, Villenave d’Ornon, France, 10 January 2022 (virtual)
88. “Simulating forest microclimates in an Earth system model,” 2022 AMS annual meeting, 27 January 2022 (virtual)
89. “The internal variability of the terrestrial carbon cycle,” 2022 CESM Land Model and Biogeochemistry Working Group, 31 January 2022 (virtual)
90. “Predicting life in the Earth system - linking the geosciences and ecology: updates on collaborations between NCAR and NEON to advance Earth system science at NSF,” President’s Council, 28 February 2022 (virtual)
91. “Data CI Pilot: NCAR and NEON cyberinfrastructure collaborations to enable convergence research linking the atmospheric and biological sciences,” NSF Cyberinfrastructure for Major Facilities Workshop, 2 March 2022 (virtual)
92. “Modeling plant canopies in the Earth system: moving beyond the big-leaf paradigm to multilayered canopies,” 2nd ozone dry deposition workshop, ACOM/NCAR, 30 March 2022 (virtual)
93. “Biosphere-atmosphere interactions in Earth system models,” Department of Atmospheric Science, Colorado State University, 5 & 7 April 2022 (virtual)
94. “Deforestation, climate change, and the making of Earth system science: a 25-year (and more) perspective,” Max Planck Institute for Biogeochemistry, 25th Anniversary Symposium, 3 June 2022 (virtual)