

## Colleen M. Iversen · Curriculum Vitae

Oak Ridge National Laboratory · Climate Change Science Institute · Environmental Sciences Division ·  
Oak Ridge · TN · 37831 · Phone: (865) 241-3961 · iversencm@ornl.gov · <http://www.ornl.gov/~ciz>

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### Research interests

I am an ecosystem ecologist who uses a variety of field and laboratory techniques to understand and predict how ecosystems are shaped by climatic change. Specifically, I work at the root-soil interface to investigate how atmospheric and climatic change alters belowground carbon and nutrient cycling.

### Education

- 2003 – 2008**      **Ph.D., University of Tennessee, Knoxville**  
Ecology and Evolutionary Biology  
Co-advisors: Richard J. Norby and Aimée T. Classen  
Dissertation: Forest responses to rising atmospheric CO<sub>2</sub>: Causes and consequences of increased fine-root production in a CO<sub>2</sub>-enriched sweetgum plantation
- 2001 – 2004**      **M.S., University of Notre Dame**  
Biological Sciences  
Advisor: Scott D. Bridgham  
Thesis: Scaling community nitrogen use- and uptake efficiencies in response to increased nutrient availability in peatlands
- 1997 – 2001**      **B.S. (*cum laude*), Hope College**  
Biological and Environmental Sciences

### Appointments

- 2012 – Present**    **Staff Scientist**  
Climate Change Science Institute and  
Environmental Sciences Division  
Oak Ridge National Laboratory
- 2010 – 2012**      **Associate Staff Scientist**  
Environmental Sciences Division  
Oak Ridge National Laboratory
- 2008 – 2010**      **Post-doctoral research associate**  
Environmental Sciences Division  
Oak Ridge National Laboratory
- 2007 – 2008**      **Marvin L. Wesely Graduate Research Environmental Fellow**  
Global Change Education Program  
Department of Energy

### Publications

2015

Heikoop JM, Throckmorton HM, Newman BD, Perkins GB, **Iversen CM**, Roy Chowdhury T, Romanovsky V, Graham DE, Norby RJ, Wilson CJ, and Wullschleger SD. 2015. Isotopic identification of soil and permafrost nitrate sources in an Arctic tundra ecosystem. ***Journal of Geophysical Research – Biogeosciences*** 120: 1000-1017.

Hockaday WC, Gallagher ME, Masiello CA, Baldock JA, **Iversen CM**, Norby RJ. 2015. Forest soil carbon oxidation state and oxidative ratio responses to elevated CO<sub>2</sub>. *Journal of Geophysical Research: Biogeosciences* 120: 1797-1811.

**Iversen CM**, Sloan VL, Sullivan PF, Euskirchen ES, McGuire AD, Norby RJ, Walker AP, Warren JM, Wullschleger SD. 2015. The unseen iceberg: Plant roots in arctic tundra (Tansley Review). *New Phytologist* 205: 34-58.

Mao J, Ricciuto DM, Thornton PE, Warren JM, King AW, Shi X, Iversen CM, Norby RJ. 2015. Evaluating the Community Land Model in a pine stand with <sup>13</sup>CO<sub>2</sub> labeling and shading manipulations. *Biogeosciences Discussion* 12: 6971-7015, DOI:10.5194/bgd-12-6971-2015.

McCormack ML, Dickie IA, Eissenstat DM, Fahey TJ, Fernandez CW, Guo D, Helmisaari H-S, Hobbie EA, **Iversen CM**, Jackson RB, Leppälammil-Kujansuu J, Norby RJ, Phillips RP, Pregitzer KS, Pritchard SG, Rewald B, Zadworny M. 2015. Redefining fine roots improves understanding of below-ground contributions to terrestrial biosphere processes (Tansley Review). *New Phytologist* 207: 505-518.

Medlyn BE, Zaehle S, De Kauwe MG, Walker AP, Dietze MC, Hanson P, Hickler T, Jain A, Luo Y, Parton W, Prentice IC, Thornton PE, Wang S, Wang Y-P, Weng E, **Iversen CM**, McCarthy H, Warren JM, Oren R, Norby RJ. Using ecosystem experiments to improve vegetation models. *Nature Climate Change* 5: 528-534.

Treat C, Natali S, Ernakovich J, **Iversen CM**, Lupascu M, McGuire AD, Norby RJ, Roy Chowdhury T, Richter A, Šantrůčková H, Schädel C, Schuur EAG, Sloan VL, Turetsky M, Waldrop M. A pan-Arctic synthesis of CH<sub>4</sub> and CO<sub>2</sub> production from anoxic soil incubations. *Global Change Biology* 21: 2787-2803.

Wang D, Janjusic T, **Iversen CM**, Thornton PE, Krassovski M, Wu W, Xu Y. 2015. A scientific function test framework for modular environmental model development: Application to the Community Land Model. 1st IEEE/ACM International Workshop on Software Engineering for High Performance Computing in Science, Florence, Italy, May 2015, pp. 16-23.

Warren JM, Hanson PJ, **Iversen CM**, Kumar J, Walker AP, Wullschleger SD. 2015. Root structural and functional dynamics in terrestrial biosphere models – Evaluation and recommendations (Tansley Review). *New Phytologist* 205: 59-78.

Wullschleger SD, Breen A, **Iversen CM**, Olson M, Nasholm T, Ganeteg U, Wallenstein M, Weston D. 2015. Genomics in a changing Arctic: Critical questions await the molecular ecologist. *Molecular Ecology* 24: 2301–2309.

## 2014

De Kauwe MG, Medlyn BE, Zaehle S, Walker AP, Dietze MC, Wang Y-P, Luo Y, Jain AK, El-Masri B, Hickler T, Wårlind D, Weng E, Parton WJ, Thornton PE, Wang S, Prentice IC, Asao S, Smith B, McCarthy HR, **Iversen CM**, Hanson PJ, Warren JM, Oren R, Norby RJ. 2014. Where does the carbon go? A model-data intercomparison of vegetation carbon allocation and turnover processes at two temperate forest free-air CO<sub>2</sub> enrichment sites. *New Phytologist* 203: 883-899.

**Iversen CM**. 2014. Using root form to improve our understanding of root function. *New Phytologist* 203: 707-709.

Iversen CM, Norby RJ. 2014. Terrestrial plant productivity and carbon allocation in a changing climate. In Freedman B, ed. **Handbook of Global Environmental Pollution: Global Environmental Change**, New York, NY: Springer, pp. 297-316.

Tfaily MM, Cooper WT, Kostka J, Chanton PR, Schadt CW, Hanson PJ, Iversen CM, Chanton JP. 2014. Organic matter transformation in the peat column at Marcell Experimental Forest: Humification and vertical stratification. **Journal of Geophysical Research: Biogeosciences** 119: 661-675.

Walker AP, Hanson PJ, De Kauwe MG, Medlyn BE, Zaehle S, Asao S, Dietze M, Hickler T, Huntingford C, Iversen CM, Jain A, Lomas M, Luo YQ, McCarthy H, Parton WJ, Prentice IC, Thornton PE, Wang SS, Wang YP, Warlind D, Weng ES, Warren JM, Woodward FI, Oren R, Norby RJ. Comprehensive ecosystem model-data synthesis using multiple data sets at two temperate forest free-air CO<sub>2</sub> enrichment experiments: Model performance at ambient CO<sub>2</sub> concentration. **Journal of Geophysical Research-Biogeosciences** 119: 937-964.

Wullschleger SD, Epstein HE, Box EO, Euskirchen ES, Goswami S, Iversen CM, Kattge J, Norby RJ, van Bodegom PM, Xu X. 2014. Plant functional types in Earth System Models: Past experiences and future directions for application of dynamic vegetation models in high-latitude ecosystems. **Annals of Botany** 114: 1-16.

Zaehle S, Medlyn BE, De Kauwe NG, Walker AP, Dietze MC, Hickler T, Luo Y, Wang Y-P, El-Masri B, Thornton P, Jain A, Wang S, Warlind D, Weng E, Parton W, Iversen CM, Gallet-Budynek A, McCarthy H, Finzi A, Hanson PJ, Prentice IC, Oren R, Norby RJ. 2014. Evaluation of 11 terrestrial carbon–nitrogen cycle models against observations from two temperate Free-Air CO<sub>2</sub> Enrichment studies. **New Phytologist** 202: 803–822.

## 2013

Lynch DJ, Matamala R, Iversen CM, Norby RJ, Gonzalez-Meler MA. 2013. Stored carbon partly fuels fine-root respiration but is not used for production of new fine roots. **New Phytologist** 199: 420-430.

## 2012

Iversen CM, Keller JK, Garten CT, Norby RJ. 2012. Soil carbon and nitrogen cycling and storage throughout the soil profile in a sweetgum plantation after 11 years of CO<sub>2</sub>-enrichment. **Global Change Biology** 18: 1684-1697. (Faculty of 1000 article recommendation, <http://f1000.com/714597877>).

Iversen CM, Murphy MT, Allen MF, Childs J, Eissenstat DM, Lilleskov EA, Sarjala TM, Sloan VL, Sullivan PF. 2012. Advancing the use of minirhizotrons in wetlands. **Plant and Soil** 352: 23–39.

Warren JM, Iversen CM, Garten CT, Norby RJ, Childs J, Brice DJ, Evans RM, Gu L, Thornton PE, Weston DJ. 2012. Timing and magnitude of carbon partitioning through a young loblolly pine (*Pinus taeda* L.) stand using <sup>13</sup>C labeling and shade treatments. **Tree Physiology** 32: 799-813.

McMurtrie RE, Iversen CM, Dewar RC, Medlyn BE, Näsholm T, Pepper DA, Norby RJ. 2012. Plant root distributions and nitrogen uptake predicted by a hypothesis of optimal root foraging. **Ecology and Evolution** 2: 1235-1250.

## 2011

Garten CT, Iversen CM, Norby RJ. 2011. Litterfall <sup>15</sup>N abundance indicates declining soil nitrogen availability in a free air CO<sub>2</sub>-enrichment experiment. **Ecology** 92: 133-139.

**Iversen CM**, Hooker TD, Classen AT, Norby RJ. 2011. Net mineralization of N at deeper soil depths as a potential mechanism for sustained forest production under elevated [CO<sub>2</sub>]. *Global Change Biology* 17: 1130-1139.

## 2010

**Iversen CM**. 2010. Digging deeper: Fine root responses to rising atmospheric CO<sub>2</sub> concentration in forested ecosystems. *New Phytologist* 186: 346-357.

**Iversen CM**, Bridgham SD, Kellogg LE. 2010. Scaling plant nitrogen-use and uptake efficiencies in response to nutrient addition in peatlands. *Ecology* 91: 693-707.

**Iversen CM**, O'Brien SL. 2010. Organized Oral Session 3. Missing links in the root-soil organic matter continuum. *Bulletin of the Ecological Society of America* 91: 54-64.

Norby RJ, Warren JM, **Iversen CM**, Medlyn BE, McMurtrie RE. 2010. CO<sub>2</sub> enhancement of forest productivity constrained by limited nitrogen availability. *Proceedings of the National Academy of Sciences, USA* 107: 19368-19373.

## 2009

Franklin O, McMurtrie RE, **Iversen CM**, Crous KY, Finzi A, Tissue DT, Ellsworth DS, Oren R, Norby RJ. 2009. Forest fine-root production and nitrogen use under elevated CO<sub>2</sub>: contrasting responses in evergreen and deciduous trees explained by a common principle. *Global Change Biology* 15: 132-144.

O'Brien SL, **Iversen CM**. 2009. Missing links in the root-soil organic matter continuum. *New Phytologist* 184: 513-516.

## 2008

**Iversen CM**, Ledford J, Norby RJ. 2008. CO<sub>2</sub> enrichment increases carbon and nitrogen input from fine roots in a deciduous forest. *New Phytologist*. 179: 837-847.

**Iversen CM**, Norby RJ. 2008. Nitrogen limitation in a sweetgum plantation: Implications for carbon allocation and storage. *Canadian Journal of Forest Research* 38: 1021-1032.

## 2005 – 2007

Finzi AC, Norby RJ, Calfapietra C, Gallet-Budynek A, Gielen B, Holmes WE, Hoosbeek MR, **Iversen CM**, Jackson RB, Kubiske MB, Ledford J, Liberloo M, Oren R, Polle A, Pritchard S, Zak DR, Schlesinger WH, Ceulemans R. 2007. Increases in nitrogen uptake rather than nitrogen-use efficiency support higher rates of temperate forest productivity under elevated CO<sub>2</sub>. *Proceedings of the National Academy of Sciences, USA* 104: 14014-14019.

Keller JK, Bauers AK, Bridgham SD, Kellogg LE, **Iversen CM**. 2006. Nutrient control of microbial carbon cycling along an ombrotrophic-minerotrophic peatland gradient. *Journal of Geophysical Research* 111: G03006.

Norby RJ, **Iversen CM**. 2006. Nitrogen uptake, distribution, turnover, and efficiency of use in a CO<sub>2</sub>-enriched sweetgum forest. *Ecology* 87: 5-14.

Keller JK, Bridgham SD, Chapin CT, **Iversen CM**. 2005. Limited effects of six years of fertilization on carbon mineralization dynamics in a Minnesota fen. *Soil Biology and Biochemistry* 37: 1197-1204.

## External funding

### Current

- 2013 – Measuring and modeling fine roots to improve predictive understanding of climate change feedbacks; **US Department of Energy**; PI.
- 2011 – Next-Generation Ecosystem Experiments (NGEE) – Arctic (<http://ngee-arctic.ornl.gov/>); **US Department of Energy**; Co-I.
- 2010 – Spruce and Peatland Responses Under Climatic and Environmental Change (SPRUCE) (<http://mnspruce.ornl.gov/>); **US Department of Energy**; Co-I.

### Previous

- 2010 – 2013 Partitioning in Trees and Soils (PiTS): Field research facilities for testing and improving dynamic carbon partitioning representations in global models; **US Department of Energy**; Co-PI.
- 2007 – 2009 Doctoral Dissertation Improvement Grant. Will CO<sub>2</sub> mediated increases in fine-root litter progressively decrease forest N availability by increasing N immobilization in soil organic matter? **National Science Foundation**.
- 2005 – 2008 Graduate Research Environmental Fellowship. Global Change Education Program, **US Department of Energy**.
- 2005 Ehleringer Stable Isotope Ecology course at the University of Utah. Tuition grant from Department of Ecology and Evolutionary Biology, **University of Tennessee**.
- 2004 Summer Research Grant. Department of Ecology and Evolutionary Biology, **University of Tennessee**.

### Honors and awards

- 2012 Stanley I. Auerbach Early-Career Award for Excellence in Environmental Sciences. Environmental Sciences Division, Oak Ridge National Laboratory.
- 2010 Finalist in *New Phytologist* Tansley Medal competition for mini-review: Iversen CM (2010), *New Phytologist* 186: 346-357. Highlighted in Woodward & Hetherington 'The *New Phytologist* Tansley medal', *New Phytologist* 186: 263-264.
- 2009 Distinguished Achievement Award for Post-Graduate Research. Environmental Sciences Division, Oak Ridge National Laboratory.
- 2006 Best student poster presentation in the Soil Ecology Section of the Ecological Society of America annual meeting, Memphis, TN, USA.
- 2006 Travel award from Terrestrial Ecosystem Responses to Atmospheric and Climatic Change network to attend forested FACE synthesis in Antwerp, Belgium.
- 2005 Second best student poster presentation. Soil Ecology Society biennial meeting, Argonne National Laboratory, Argonne, IL, USA.
- 2004 Travel award to attend Terrestrial Ecosystem Responses to Atmospheric and Climatic Change annual meeting, Fort Meyers, FL, USA.
- 2003 – 2004 Travel awards from the Society of Wetland Scientists to attend Society of Wetland Scientists annual meeting, New Orleans, LA, USA (2003) and Association of Southeastern Biologists annual meeting, Memphis, TN, USA (2004).

## Professional activities

Joint Faculty, Bredesen Center for Interdisciplinary Research and Graduate Education at the University of Tennessee, Knoxville (2015 – )

Editorial Advisory Board, *New Phytologist* (2014 – )

Organizing committee: 'DOE workshop on trait methods for representing ecosystem change', held in Rockville, MD, USA in November, 2015, and funded by the Department of Energy, Office of Science.

Co-organizer: 'A path forward for improved representation of fine roots in large-scale models: Linking models, data, and experiments'. Organized Oral Session at the annual Ecological Society of America meeting, August, 2014, in Sacramento, CA, USA (<http://eco.confex.com/eco/2014/webprogram/Session9688.html>).

Organizer: 'Roots in Models' workshop held at Oak Ridge National Laboratory, TN, USA in June, 2014, and funded by the Department of Energy, Office of Science ([http://web.ornl.gov/~ciz/Roots\\_in\\_Models.html](http://web.ornl.gov/~ciz/Roots_in_Models.html)).

Organizing committee: 'Scaling Root Processes: Global Impacts' workshop held in Washington, DC, USA, in March, 2012, and funded by the Department of Energy, Office of Science (<http://www.bio.anl.gov/ScalingRootProcesses-GlobalImpactsWorkshop>).

Organizer: 'Advancing minirhizotron use to examine ephemeral root dynamics in peatland and high carbon ecosystems'. Small workshop hosted at Oak Ridge National Laboratory in October, 2010, and funded by the Department of Energy, Office of Science and New Phytologist Trust.

Co-organizer: 'Missing links in the root-soil organic matter continuum'. Organized Oral Session at the annual Ecological Society of America meeting, August, 2009 in Albuquerque, NM, USA.

Ad-hoc reviewer for: *Acta Oecologica; Agriculture, Ecosystems & Environment; Annals of Botany; AoB PLANTS; Biogeosciences; Biology and Fertility of Soils; Biological Invasions; Canadian Journal of Forest Research; Ecology, Ecology Letters; Ecosphere; Global Biogeochemical Cycles; Global Change Biology; Global Ecology and Biogeography; Journal of Ecology; Journal of Geophysical Research – Biogeosciences; Nature; New Phytologist; Oecologia; Plant Physiology; Plant and Soil; Polar Science; Proceedings of the National Academy of Sciences of the United States of America; Soil Biology and Biochemistry; Soil Science Society of America Journal; Tree Physiology; National Science Foundation; National Institute for Climate Change Research; Department of Energy, Office of Science.*

Society memberships: American Geophysical Union, Ecological Society of America, Soil Ecology Society.

Updated on 25 November 2015.