

Andrew J. Burton - Associate Professor

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[Training and Experience](#) [Awards](#) [Teaching](#) [Advising](#) [Research Projects](#)
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Research Interests:

Forest responses to global change factors Belowground processes
Carbon and nutrient cycling Physiological ecology of tree roots
Undergraduate involvement in research

Education:

Ph.D. 1997 Forest Science (Forest Ecology), Michigan Technological University
M.S. 1986 Forestry (Soils and Hydrology), Michigan State University
B.S. 1983 Forestry, Michigan State University

Professional Experience:

2008 to present Associate Professor, School of Forest Resources and Environmental Science, Michigan Technological University

2008 to present Director, Ecosystem Science Center, Michigan Technological University. The Ecosystem Science Center (ESC) is designed to advance our understanding of how ecosystems function and how human activities influence ecosystem processes. The Center's two main objectives are to: (1) foster ecosystem research and (2) educate graduate and undergraduate students in the area of ecosystem science. Current initiatives designed to meet these objectives include: graduate and undergraduate research grants, graduate and undergraduate travel awards, an annual Graduate Research Forum poster session, an international faculty exchange, co-sponsorship of the Distinguished Ecologist Lecture Series, and co-sponsoring equipment purchases in conjunction with the Universities REF Infrastructure Improvement grants. .

2008 to present Co-Director, Aspen FACE Project/ Northern Forest Ecosystem Experiment (NFEE). With the unfortunate passing of Dr. David Karnosky in October, 2008, I was asked to become the PI at Michigan Tech for the Aspen FACE project, which has since been renewed as the NFEE. The Aspen FACE (Free-Air Carbon Dioxide Enrichment) Experiment is a multidisciplinary

study to assess the effects of increasing tropospheric ozone and carbon dioxide levels on the structure and function of northern forest ecosystems. This project, led by Michigan Tech and the US Forest Service, with primary funding from DOE and the USFS, is one of the leading global change research efforts in the world and involves collaboration among scientists from 8 countries. Thus far there have been over 100 Aspen FACE scientific users, who have worked together for more than a decade to produce over 120 peer-reviewed publications.

2007 to present	Director, Midwestern Regional Center of the DOE National Institute for Climatic Change Research. The Center solicits, organize ad-hoc and panel reviews, makes funding recommendations and administer funding and reporting of selected climatic change research projects in a thirteen state region. During its history, NICCR Midwest has made 39 research awards to universities in the region, with a total value of \$8.2 million. Research supported by the Center includes: 1) field manipulations of temperature and moisture designed to reduce scientific uncertainty about potential effects of climatic change on the structure and functioning of terrestrial ecosystems; 2) measurements of contemporary exchanges of mass and energy between the atmosphere and terrestrial ecosystems to reduce scientific uncertainty about possible effects of an altered terrestrial carbon cycle and/or surface energy exchange on global and/or regional climate; and 3) studies using synthesis of existing data and modeling to better understand or forecast potential effects of climatic change on ecological systems and/or feedbacks from terrestrial ecosystems to climate.
2005 to 2008	Research Associate Professor and Lecturer, School of Forest Resources and Environmental Science, Michigan Technological University
2005 to 2007	Assistant Director, Midwestern Regional Center of the DOE National Institute for Climatic Change Research
2003 to 2005	Research Assistant Professor, School of Forestry and Wood Products, Michigan Technological University
2001 to 2003	Research Assistant Professor, School of Forestry and Wood Products, Michigan Technological University
1994 to 2001	Research Scientist, Forest Ecology Lab, School of Forestry and Wood Products, Michigan Technological University.
1995	Lecturer, School of Natural Resources & Environment, University of Michigan. (Winter Semester only)
1987 to 1994	Research Specialist, Forest Ecology Lab, Department of Forestry, Michigan State University.
1984 to 1986	Graduate Research Assistant, Department of Forestry, Michigan State University.

Awards and Honors:

Certified Senior Ecologist by the Ecological Society of America

Certified Forester (#3355) by the Society of American Foresters

Member of honorary societies Sigma Xi, Phi Kappa Phi, and Xi Sigma Pi

Best paper, 2010 Soil Science Society of America meeting (Division S-7, Session 125)

Best paper, 2005 Soil Science Society of America meeting (Division S-7, Session 193)

Best paper, 2003 Soil Science Society of America meeting (Division S-7, Session 13)

Best paper, 1998 Soil Science Society of America meeting (Division S-7, Session 8)

Included in Who's Who Among America's Teachers for 2004 and 2005. Must be nominated by a student who is on The National Dean's List. Only 2% of the nation's teachers are included in more than one edition.

Top 10% of MTU instructors on student evaluation forms (Fall 2003)

National Merit Scholar (1979)

Michigan State University Board of Trustees Award (1983) for placing 2nd out of 1,901 Fall 1983 graduates

Teaching:

Courses Taught at Michigan Tech:

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|-----------|---|
| 2009-2011 | FW5100, "Advanced Terrestrial Ecology", Spring Semester. Developed this course examining current topics in terrestrial ecosystem ecology, including the use of lab and field analytical techniques. 3 credits (3 hr lecture) |
| 2008-2010 | FW3020, "Forest and Landscape Ecology", Fall Semester. Significantly redesigned the lectures and labs of this existing course. 3 credits (2 hr lecture, three 3-hr labs) |
| 2006-2007 | FW3330, "Soil Science", Fall Semester. 4 credits (3 hr lecture, three 3-hr lab sections) |
| 2005 | FW3190, "Multi-resource Assessment", Fall Semester. Significantly revised this existing course in the Integrated Field Practicum. 3 credits. |
| 2005 | FW3180, "Geomorphology, Landscapes and Ecosystems", Fall Semester, Revised the landscape and ecosystem portions of this existing course in the Integrated Field Practicum. 2 credits. |
| 2004-2007 | FW2020, "Basic Ecology Field Skills", Semester. Developed and implemented this one-week short course held prior to Fall Semester to prepare transfer students for taking Forest and Landscape Ecology and its prerequisites simultaneously. 1 credit. |
| 2000-2004 | FW2050, "Measuring Forest Resources", Fall Semester. Developed and implemented this new course for Fall Semester 2000. 3 credits (2 hr lecture and three to four 3-hr labs) |

Summary of Teaching Evaluations:

Students' responses to questions on Evaluation Form (Rated 1 - 5, with 5 being excellent or strongly agree). Question 20: "Taking everything into account, I would consider this instructor to be an excellent teacher."

Year	Semester	Course	Students	Credits	Question 20
2000	Fall	FW2050	57	3	4.37
2001	Fall	FW2050	42	3	4.69
2002	Fall	FW2050	46	3	4.76
2003	Fall	FW2050	37	3	4.83
2003	Fall	FW5510*	1	2	
2004	Fall	FW2050	57	3	4.71
2004	Fall	FW5510*	3	2	
2004	Fall	FW2020	13	1	
2005	Fall	FW3180	10	2	4.56
2005	Fall	FW3190	23	3	4.70
2005	Fall	FW2020	13	1	
2006	Fall	FW3330	51	4	4.57
2006	Fall	FW2020	20	1	
2007	Fall	FW3330	54	4	4.72
2007	Fall	FW2020	18	1	
2007	Fall	FW5510 [†]	1	2	
2008	Fall	FW3020	52	3	4.81
2009	Spring	FW5510 [§]	5	3	4.50
2009	Fall	FW3020	63	3	4.67
2010	Spring	FW5100	6	3	5.00

*Special topics - graduate students in Measuring Forest Resources

[†]Special topics – independent study in hydrology

[§]Advanced Terrestrial Ecology, taught as special topics

Other Course Instruction:

Lecturer	NR432, "Hydrology and Watershed Management", School of Natural Resources & Environment, University of Michigan, Winter 1995.
Teaching Assistant	Forest Hydrology (2 years), Dendrology, and Forest Ecology at Michigan State University
Guest Lecturer	Dendrology, Forest Soils, Forest Hydrology, Forest Ecology, and Advanced Forest Ecology.

Graduate Student Advising/Mentoring

Major Advisor – Doctoral Students

- Carley Kratz May 2009 to present. Erik Lilleskov co-Advisor. Research Topic “Mycorrhizal Community Composition and Functional Responses to Soil Warming”
- Emmanuel Ebanyenle August 2009 to present. Andrew Storer co-Advisor. Research Topic “Responses of Wood Anatomical Properties to Environmental Stressors: Elevated CO₂ and O₃ in Aspen and Shoot Borers in African Mahagony”

Major Advisor – Master’s Students

- Mickey Jarvi August 2009 to present. Research Topic “Temperature Acclimation of Woody Plant Root Systems in Response to Seasonal Climatic Variation and Short-term Experimental Soil Warming”
- Daniel Yeboah August 2009 to present. Andrew Storer co-Advisor. Research Topic “Carbon Sequestration Potential of African Tropical Plantation Species”
- Adam Airoidi MS December 2010. Thesis “Forest-Limit Fluctuation in Response to Land Use and Climate Variability: A History of the Alpine Forest Regions Around Røros, Sør-Trøndelag, Norway, and the Social and Ecological Implications of Past Industrialization”
- Lisa Rouse MS December 2008. “Characterizing Ozone Tolerance in Trembling Aspen: Implications for Improving Carbon Sequestration Potential in Populus”
- Lisa Rouse is currently a Biological Science Technician in the Subtropical Plant Pathology Unit of the USDA Agriculture Research Service in Fort Pierce Florida.
- Jill Katakowski MS December 2007 (coursework option)
Jill (Katakowski) Dohner is currently Nursery Operations Manager at The Greening of Detroit

Doctoral Committee Service

- Alex Collins January 2011 to present. M. Cavaleri, advisor.
- Carrie Andrew PhD August 2009. E. Lilleskov, advisor. Dissertation “Response of Ectomycorrhizal Fungi to Elevated Atmospheric CO₂ and O₃ within Northern Deciduous Forests”.
- Linda van Diepen PhD December 2008. E. Lilleskov & K Pregitzer, advisor. Dissertation “The role and diversity of arbuscular mycorrhizal fungi in *Acer saccharum* dominated forest ecosystems under natural and N-amended conditions
- Alan Talhlem PhD December 2010. K. Pregitzer, advisor.

Master's Committee Service

- Trevor Roberts August 2010 to present. R. Froese, advisor.
- Evan Anderson August 2009 to present. B. Orr, advisor.
- Nicholas Jensen MS August 2009. C. Webster, advisor. Thesis "Ungulate Winter Habitat Selection as a Driver of Heterogeneity in Ground-Layer Plant Communities"
- Adam Gahagan MS May 2007. C. Giardina, advisor. Thesis "Carbon Cycling and Storage after 60 Years of Stand Development in Red Pine (*Pinus resinosa*) Plantations and Mixed Hardwood Stands in Northern Michigan Old Fields"
- Forrest Gibeault MF 2005 J. Pickens, advisor.
- Amanda Holey MF 2005 J. Pickens, advisor.
- Josh Watten MF 2005 J. Pickens, advisor.
- Jennifer Eikenberry MS 2004. K. Pregitzer, advisor. Thesis "Chronic Nitrate-Addition Alters Northern Hardwood Root and Leaf Litter Chemistry".
- Jeff Crawford MS 2002. K. Pregitzer, advisor. Thesis "The Effects of Nitrogen Amendments on Belowground Carbon Cycling in Second Growth Sugar Maple Forests Along a Climatic and N-Deposition Gradient in Michigan".

Current Research Projects:

Michigan Gradient Study - Long Term Nitrogen Deposition (1987 - present) Nitrogen (N) saturation of terrestrial ecosystems is one of the most important contemporary ecological issues. Researchers at Michigan Technological University and the University of Michigan are adding nitrate (NO_3^-) to northern hardwood forests in Michigan to learn how this common Lakes States forest type responds to chronic N additions. The Michigan Gradient study was established in 1987 to examine the effects of climate and atmospheric deposition on ecosystem processes in the Great Lakes region and continues today with support from NSF. Four northern hardwood study sites extend 500 km from northwestern Upper Michigan to southern Lower Michigan. Since 1994, these study sites have received experimental N additions ($30 \text{ kg NO}_3^- \text{-N ha}^{-1} \text{ y}^{-1}$), intended to simulate high levels of chronic atmospheric N deposition. The purpose of this field experiment is to understand the mechanisms controlling carbon (C) and N cycling in the face of chronic N deposition and the long-term consequences of N saturation.

Soil Warming in Northern Forests (2008 to present). We are assessing the degree to which temperature acclimation occurs in root systems of a variety of woody plants and determining if such acclimation is a short-term, direct physiological adjustment to warmer temperatures (days to months) or a longer term response as the ecosystem adjusts to long-term warming (years). What may be of most importance are the amounts of C allocated to root respiration and mycorrhizal symbiosis that will exist in the ecosystem after N cycling, aboveground productivity, litter quantity, quality and decomposition, and microbial community composition and function have equilibrated to the altered climatic regime. During this project we will assess the interrelationships that exist between such processes and determine the factors that will ultimately control soil CO_2 efflux and aboveground growth in the altered climate.

Aspen FACE/Northern Forest Ecosystem Experiment (1998 to present). Since 1998, we have examined the interacting effects of elevated CO_2 and O_3 on ecosystem processes in an aggrading northern forest ecosystem. This study utilized a free-air carbon dioxide enrichment (FACE) facility in Rhinelander, Wisconsin to compare the responses of rapid-growing shade intolerant species (trembling aspen [*Populus tremuloides* Michx.] and paper birch [*Betula papyrifera* Marsh.]) to that of a slower growing shade tolerant species (sugar maple [*Acer saccharum* Marsh.]).

Midwestern Regional Center of the National Institute for Climatic Change Research (2005 to present). The National Institute for Climate Change Research (NICCR) is sponsored by the U.S. Department of Energy's (DOE's) Office of Biological and Environmental Research (BER). The Midwestern Region supports work in the following states: North Dakota, South Dakota, Nebraska, Kansas, Oklahoma, Minnesota, Iowa, Missouri, Wisconsin, Illinois, Michigan, Indiana, and Ohio. The Midwestern Regional Center funds proposals that use a variety of approaches to answer questions relevant to the DOE's climate change research program. These include experiments that manipulate temperature, moisture and other global change factors; studies that seek to understand how the distribution of species and ecosystems might change under future climates; studies that use measurements and modeling to examine current ecosystem fluxes of energy and mass and those that would exist under future conditions; and studies that synthesize existing data sets to improve our understanding of the effects of climatic change on

terrestrial ecosystems. The broad variety of projects the Midwestern Regional Center supports give us a unique opportunity to greatly improve our ability to predict the future health, composition and function of important agricultural and natural terrestrial ecosystems within the Midwestern Region. Since 2005, the NICCR Midwestern Regional Center has funded 39 climatic change research projects with a total value of more than \$7 million. These projects have resulted in over 100 peer-reviewed publications. For more information about specific projects, follow the links on our NICCR website (www.niccr.mtu.edu).

Treeline Change in Norway (2009 to present). This project, initiated by MS Student Adam Airolidi, examines the recent rebound in treeline elevation in Norway in response to changes in land use and climate. It also assesses the potential C sequestration as alpine forests redevelop in their former range in the absence of grazing and mining pressure.

Past Research Projects:

REU Site for Ecosystems in Transition (PI). 2004 - 2006. Each summer, ten Research Experiences for Undergraduates (REU) students spend the summer at Michigan Technological University examining ecosystems in transition. The students work with faculty mentors on existing large-scale, long-term, interdisciplinary experiments examining the responses of forest ecosystems to climatic variations, anthropogenic pollutants, changing wildlife populations, exotic species invasions and ecosystem restoration efforts.

Cross-Site Study: A cross-biome examination of belowground C allocation (Co-PI). 1997 - 2001. How does belowground allocation of carbon responds to environmental variables, such as temperature and moisture, and to altered availability of resources, such as nitrogen? To address these questions, researchers in the Forest Ecology group at MTU quantified root and soil respiration, root system architecture, root production and mortality, and mycorrhizal community composition in ten common North American forest ecosystems.

Carbon and Nutrient Cycling in Olympic National Park (Co-PI). 1998-2002. Eleven diverse study sites were used to learn how soil CO₂ efflux (soil respiration) and the production of dissolved organic carbon (DOC) and dissolved organic nitrogen (DON) were affected by seasonal changes in temperature and moisture availability at a given location and by climatic differences that existed along mountain elevation gradients.

Research Grants:

Active Grants:

- 5/2010 – 4/2015 USDA Forest Service “The Northern Forest Ecosystem Experiment”, \$346,031 (includes \$55,143 in cost share). **A.J. Burton (PI)**
- 8/2010 – 5/2011 Michigan Tech Research Excellence Funds - Infrastructure Enhancement “Enhancing Michigan Tech’s ability to assess ecosystem sustainability and trace metal movement in upland, wetland and aquatic ecosystems” \$34,000 **A.J. Burton (PI)**, R. Froese, J. Bump, R. Chimner
- 8/2009 – 8/2014 USDA Forest Service “Climate change science delivery, adaptation, and ecological assessment”, \$821,291 (includes \$171,291 in cost share), M. Janowiak (PI), **A.J. Burton (co-PI)**, T.G. Pypker, A.J. Storer and R.E. Froese
- 9/2008 – 8/2013 National Science Foundation “Collaborative LTREB Proposal: Long-Term Ecosystem Response to Chronic Atmospheric Nitrate Deposition”, \$151,628, **A.J. Burton (PI)**
- 10/2008 – 5/2011 USDA McIntire-Stennis “Ecosystem constraint of belowground autotrophic respiration: Maintaining positive NPP in a changing world”, \$32,760 (includes 11,760 in waived overhead). **A.J. Burton (PI)**
- 4/2009 – 9/2013 USDA Forest Service “Carbon, water and soils research support”, \$132,356 (includes \$16,807 in waived overhead), T.G. Pypker (PI), R.A. Chimner and **A.J. Burton (co-PI)**
- 5/2009 – 8/2013 National Science Foundation “REU Supplements to: Collaborative LTREB Proposal: Long-Term Ecosystem Response to Chronic Atmospheric Nitrate Deposition”, \$14,000, **A.J. Burton (PI)**
- 4/2008 – 11/2011 US Department of Energy-National Institute for Climatic Change Research “Short and long-term temperature acclimation of roots systems in woody plants and the moderation of warming-induced enhancement of soil CO₂ efflux”, \$407,954, **A.J. Burton (PI)** and E.A. Lilleskov.
- 4/2008 – 3/2012 US Department of Energy “Impacts of interacting elevated atmospheric CO₂ and O₃ on the structure and functioning of a northern forest ecosystem: Operating and decommissioning the Aspen FACE Project. \$3,893,313, D.F. Karnosky (PI, deceased), K.S. Pregitzer, and D.R. Zak. **A.J. Burton (PI beginning 11/2008)**
- 12/2005 – 11/2011 US Department of Energy “Midwestern Regional Center for the National Institute of Climatic Change Research” (Center administration), \$1,005,037 (includes \$296,357 in waived overhead), **A.J. Burton (PI 2007-2011)**, K.S. Pregitzer (PI through June 2007)

12/2005 – 11/2011 US Department of Energy “Supplements to Midwestern Regional Center for the National Institute of Climatic Change Research” (to fund subcontracts at Universities throughout the Midwest to conduct research projects selected by the NICCR Midwestern Center), \$7,766,784, **A.J. Burton (PI 2007-2011)**, K.S. Pregitzer (PI through June 2007).

Previously Funded Grants:

- 9/2003 – 2/2009 National Science Foundation “Nitrogen saturation: mechanisms and consequences of altered ecosystem metabolism” \$923,739 (includes \$113,739 in waived overhead), **A.J. Burton (PI from June 2007 to 2009, co-PI prior)**, K.S. Pregitzer (PI prior to June 2007), D.R. Zak.
- 6/2007 – 8/2009 US Department of Energy (via subcontract from University of Nevada-Reno) “Ecosystem response to elevated tropospheric CO₂ and O₃ is regulated by plant-microbe interactions in soil”, \$201,178. **A.J. Burton (MTU PI)**, K.S. Pregitzer and D.R. Zak.
- 6/2007 – 8/2009 National Science Foundation (via subcontract from University of Nevada-Reno) “From genes to ecosystems: mechanisms controlling long-term ecosystem response to nitrogen deposition”, \$168,327, **A.J. Burton (MTU PI)**, E.A. Lilleskov, K.S. Pregitzer and D.R. Zak.
- 3/2004 – 3/2006 National Science Foundation “REU site for ecosystems in transition: the role of research in assessing ecosystem responses to a changing environment”, \$155,463, **A.J. Burton (PI)** and K.S. Pregitzer
- 6/2000 – 12/2003 National Science Foundation “Plant-microbe interactions and the production of dissolved organic carbon and nitrogen”, \$883,480, K.S. Pregitzer (PI), **A.J. Burton (co-PI)**, and D.R. Zak
- 9/2000 – 9/2003 National Science Foundation “The movement of elements through ecosystems: major research instrumentation for the integration of research and education”, \$894,130, K.S. Pregitzer, **A.J. Burton (co-PI)**, DJ Flaspohler, S.A. Green, and W.C. Kerfoot
- 6/1998 – 6/2002 US Environmental Protection Agency “Collaborative research on belowground ecosystem function: merging long-term climate monitoring with soil, root and foodweb dynamics to understand mechanisms regulating C and N transformations”, \$387,595, K.S. Pregitzer (PI), **A.J. Burton (co-PI)**, P. Rygielwicz, R Stottlemeyer, S. Green, J. Chen, ,and E. Hobbie.
- 3/1997 – 2/2001 National Science Foundation “Factors regulating belowground carbon allocation in terrestrial ecosystems: a cross-site experiment”, \$261,302, K.S. Pregitzer (PI), **A.J. Burton (co-PI)**, M.F. Allen, R.L. Hendrick, and R.W. Ruess..

- 9/1996 – 8/2000 National Science Foundation “Cycling of NO₃-N in northern hardwood forests: regulation and consequences of N saturation”, \$690,000, K.S. Pregitzer (PI), **A.J. Burton (co-PI)**, and D.R. Zak.
- 1996 – 2003 National Science Foundation REU supplements to existing grants for undergraduate summer research projects. Funding for nine students was received. \$47,000 (wrote the supplement requests for projects on which I was a co-PI)

Pending Proposals:

- 3/2011 – 2/2015 National Science Foundation “Earthworms as ecosystem engineers: Integrating effects of altered hydrology, nutrient cycling and microbial communities on forest carbon cycling.”, \$899,402, T.G. Pypker (PI), E.A. Lillskov, C.W. Swanston, R. Kolka, and **A.J. Burton (co-PI)**
- 8/2011 – 7/2014 National Science Foundation “MRI: Acquisition Request for an Advanced Isotope Ratio Mass Spectrometer as Part of the Great Lakes Research Center Mass Spectrometry Facility”, \$561,327 (including \$168,398 in Michigan Tech cost share), M.R. Gretz (PI), J.K. Bump, **A.J. Burton (co-PI)**, P.V. Doskey, N.R. Urban
- 4/2011 – 3/2016 National Science Foundation “NSF Engineering Research Center for Sustainable forest-based biofuels transportation systems -- Wood-to-Wheels (W2W)”, \$18,493,138 (including \$1,067,898 in Michigan Tech cost share; \$2,344,890 allocated to Thrust 1 at Michigan Tech), D.R. Shonnard (PI), R.P. Anex, M.E. Cardella, J.W. Sutherland, and S.G. Washington. **A.J. Burton Thrust 1 Leader**

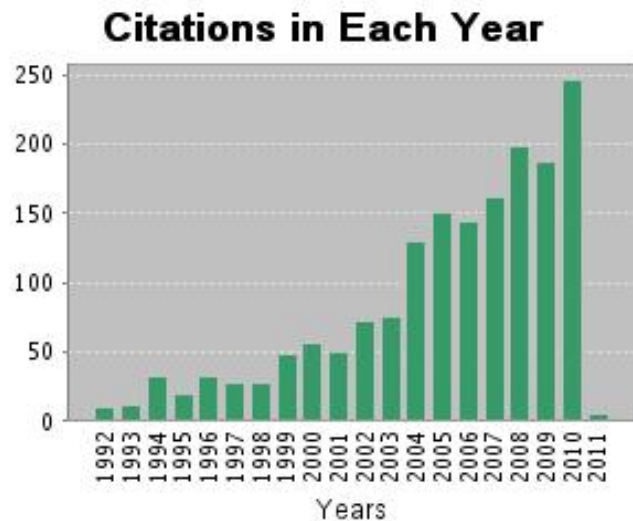
Publications

Citations – Results from ISI Web of Science, January 14, 2011:

Total Citations:
1,694

**Average Citations
per Item: 41.32**

h-index: 22



Refereed Journals:

1. Pregitzer, K.S., D.R. Zak, A.F. Talhelm, A.J. Burton, and J.R. Eikenberry. 2010. Nitrogen turnover in the leaf litter and fine roots of sugar maple. *Ecology* 91:3456-3462. [Abstract](#)
2. Burton, A.J., J.M. Melillo and S.D. Frey. 2008. Adjustment of forest ecosystem root respiration as temperature warms. *J. Integr. Plant Biol.* 50:1467-1483. [Abstract](#)
3. Pregitzer, K.S., A.J. Burton, J.S. King, and D.R. Zak 2008. Relationships among root biomass, root turnover and soil respiration following long-term exposure of northern forests to elevated atmospheric CO₂ and tropospheric O₃. *New Phytologist* 180:153-161. [Abstract](#)
4. Pregitzer, K.S., A.J. Burton, D.R. Zak, and A.F. Talhelm. 2008. Simulated chronic nitrogen deposition increases carbon storage in northern temperate forests. *Global Change Biology* 14:142-153. [Abstract](#)
5. Zak, DR, W.E. Holmes, A.J. Burton, K.S. Pregitzer, and A.F. Talhelm. 2008. Simulated atmospheric NO₃⁻ deposition increases soil organic matter by slowing decomposition. *Ecological Applications* 18:2016-2027. [Abstract](#)
6. Smemo, K.A., D.R. Zak, K.S. Pregitzer, and A.J. Burton. 2007. Characteristics of DOC exports from northern hardwood forests receiving chronic experimental NO₃⁻ deposition. *Ecosystems* 10:369-379. [Abstract](#)
7. Zak, D.R., W.E. Holmes, M.J. Tomlinson, K.S. Pregitzer, and A.J. Burton. 2006. Microbial cycling of C and N in northern hardwood forests receiving chronic atmospheric NO₃⁻ deposition. *Ecosystems* 9:242-253. [Abstract](#)

8. DeForest, J.L., D.R. Zak, K.S. Pregitzer, and A.J. Burton. 2005. Atmospheric nitrate deposition and enhanced dissolved organic carbon leaching: Test of a potential mechanism. *Soil Sci. Soc. Am. J.* 69:1233-1237. [Abstract](#)
9. Burton, A.J., K.S. Pregitzer, J.N. Crawford, G.P. Zogg, and D.R. Zak. 2004. Simulated chronic NO_3^- addition reduces soil respiration in northern hardwood forests. *Global Change Biol.* 10:1080-1091. [Abstract](#)
10. DeForest, J.L., D.R. Zak, K.S. Pregitzer, and A.J. Burton. 2004. Atmospheric nitrate deposition, microbial community composition, and enzyme activity in northern hardwood forests. *Soil Sci. Soc. Am. J.* 68:132-138. [Abstract](#)
11. DeForest, J.L., D.R. Zak, K.S. Pregitzer, and A.J. Burton. 2004. Atmospheric nitrate deposition and the microbial degradation of cellobiose and vanillin in a northern hardwood forest. *Soil Biol. Biochem.* 36:965-971. [Abstract](#)
12. Pregitzer, K.S., D.R. Zak, A.J. Burton, J.A. Ashby, and N.W. MacDonald. 2004. Chronic nitrate additions dramatically increase the export of carbon and nitrogen from northern hardwood ecosystems. *Biogeochem.* 68:179-197. [Abstract](#)
13. Zak, D.R., K.S. Pregitzer, W.E. Holmes, A.J. Burton, and G.P. Zogg. 2004. Anthropogenic N deposition and the fate of $^{15}\text{NO}_3^-$ in a northern hardwood ecosystem. *Biogeochem.* 69:143-157. [Abstract](#)
14. Burton, A.J., and K.S. Pregitzer. 2003. Field measurements of root respiration indicate little to no seasonal temperature acclimation for sugar maple and red pine. *Tree Physiol.* 23:273-280. [Abstract](#)
15. Crocker, T.L., R.L. Hendrick, R. Ruess, K.S. Pregitzer, A.J. Burton, M.F. Allen, J. Shan, and L.A. Morris. 2003. Substituting root numbers for length: Improving the use of minirhizotrons to study fine root dynamics. *Appl. Soil Ecol.* 23:127-135 [Abstract](#)
16. Kane, E.S., K.S. Pregitzer, and A.J. Burton. 2003. Soil respiration along environmental gradients in Olympic National Park. *Ecosystems* 6:326-335. [Abstract](#)
17. Ruess, R.W., R.L. Hendrick, A.J. Burton, K.S. Pregitzer, B. Sveinbjornsson, M.F. Allen, and G.E. Maurer. 2003. Coupling fine root dynamics with ecosystem carbon cycling in black spruce forests of interior Alaska. *Ecol. Monogr.* 73:643-662. [Abstract](#)
18. Burton, A.J., K.S. Pregitzer, R.W. Ruess, R.L. Hendrick, and M.F. Allen. 2002. Root respiration in North American forests: effects of nitrogen concentration and temperature across biomes. *Oecologia* 131:559-568. [Abstract](#)
19. Burton, A.J., and K.S. Pregitzer. 2002. Measurement carbon dioxide concentration does not affect root respiration rates of nine tree species in the field. *Tree Physiol.* 22:67-72. [Abstract](#)
20. Pregitzer, K.S., J.L. DeForest, A.J. Burton, M.F. Allen, R.W. Ruess, and R.L. Hendrick. 2002. Fine root architecture of nine North American trees. *Ecol. Monogr.* 72:293-309. [Abstract](#)
21. Brown, S.E., K.S. Pregitzer, D.D. Reed, and A.J. Burton. 2000. Predicting daily mean soil temperature from daily mean air temperature in four northern hardwood forest stands. *Forest Sci.* 46:297-301. [Abstract](#)

22. Burton, A.J., K.S. Pregitzer, and R.L. Hendrick. 2000. Relationships between fine root dynamics and nitrogen availability in Michigan northern hardwood forests. *Oecologia* 125:389-399. [Abstract](#)
23. Pregitzer, K.S., J.S. King, A.J. Burton, and S.E. Brown. 2000. Responses of tree fine roots to temperature. *New Phytol.* 147:105-115. [Abstract](#)
24. Zogg, G.P., D.R. Zak, A.J. Burton, and K.S. Pregitzer. 2000. Microbial immobilization and the retention of anthropogenic nitrate in a northern hardwood forest. *Ecology* 81:1858-1866. [Abstract](#)
25. Burton, A.J., K.S. Pregitzer, G.P. Zogg, and D.R. Zak. 1998. Drought reduces root respiration in sugar maple forests. *Ecol. Appl.* 8:771-778. [Abstract](#)
26. MacDonald, N.W., J.A. Witter, D.D. Reed, A.J. Burton, K.S. Pregitzer, and H.O. Liechty. 1998. Environmental stress effects on vigor, mortality, and growth in northern hardwood forests along a pollution-climate gradient. *Michigan Academician* XXX:27-47.
27. Pregitzer, K.S., M.J. Laskowski, A.J. Burton, V.C. Lessard, and D.R. Zak. 1998. Variation in sugar maple root respiration with root diameter and soil depth. *Tree Physiol.* 18:665-670. [Abstract](#)
28. Burton, A.J., G.P. Zogg, K.S. Pregitzer, and D.R. Zak. 1997. Effects of measurement CO₂ concentration on sugar maple root respiration. *Tree Physiol.* 17:421-427. [Abstract](#)
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1. Moyano, F.E., O.K. Atkin, M. Bahn, D. Bruhn, A.J. Burton, A. Heinemeyer, W.L. Kutsch, and G. Wieser. 2009. Respiration from roots and the mycorrhizosphere. Chap. 7, p. 127-156, *In* W. Kutsch, M. Bahn and A. Heinemeyer (eds). *Soil Carbon Dynamics: An Integrated Methodology*. Cambridge University Press, New York. [Abstract](#)
2. Burton, A.J., and K.S. Pregitzer. 2008. Measuring forest floor, mineral soil, and root carbon stocks. Chap. 10, p. 129-142 *In* C. Hoover (ed). *Field Measurements for Forest Carbon Monitoring: A Landscape-Scale Approach*. Springer. [Abstract](#)
3. Pregitzer, K.S., D.R. Zak, W.M. Loya, J.S. King and A.J. Burton. 2007. The contribution of root – rhizosphere interactions to biogeochemical cycles in a changing world. Chapter 7. p. 155-178 *In* Z. Cardon and J. Whitbeck (eds). *The Rhizosphere: An Ecological Perspective*, Academic Press. [Abstract](#)
4. Reed, D.D., G.D. Mroz, H.O. Liechty, K.S. Pregitzer, A.J. Burton, D.R. Zak, J.A. Witter, and N.W. MacDonald. 1994. Studying the effects of air pollution on forests along exposure gradients: experiences in the United States and opportunities for cooperation. p. 109-115 *In* Proceedings of the Conference on Climate and Atmospheric Deposition Studies in Forests (J. Solon, E. Roo-Zielinska, and A. Byternowicz, eds.). Nieborow, Poland, October 6-9, 1992. Polish Academy of Sciences.
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6. Pregitzer, K.S., A.J. Burton, D.J. Flaspohler, S.A. Green, and W.C. Kerfoot. 2004. The movement of elements through ecosystems: Major research instrumentation for the integration of research and education. Final Report to the National Science Foundation for Grant DEB 0079566.
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11. Witter, J., G. Mroz, K. Pregitzer, A. Burton et al. (16 authors). 1989. Michigan Gradient Case History Study for the NAPAP Assessment Plan. Report to EPA and the USDA Forest Service Eastern Hardwoods Research Cooperative.

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Theses:

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Presentations

Presentations at Scientific Meetings and Conferences:

1. Burton, A.J., R.A. McDonald, M.P. Jarvi, S.M. Butler, and J.M. Melillo. 2010. Responses of fine root respiration and root N to soil warming in hardwood forests. Oral presentation and published abstract, annual meeting of the Soil Science Society of America, Long Beach, CA, Oct 31-Nov 3.
2. Burton, A., S. Frey and J. Melillo. 2010. Response of fine root respiration rates and root N to soil warming in hardwood forests. Twentieth Annual Harvard Forest Ecology Symposium. Petersham, MA, Harvard Forest, Mar 16. [Abstract](#)
3. Jarvey, J., M.P. Jarvi, and A.J. Burton. 2010. Northern hardwood root respiration in response to chronic nitrogen addition. Poster presentation and published abstract, annual meeting of the Ecological Society of America, Pittsburgh, PA, Aug 1-6.
4. Jarvi, M.P., and A.J. Burton. 2010. Response of northern hardwood root respiration to warmer soils. Poster presentation and published abstract, annual meeting of the Ecological Society of America, Pittsburgh, PA, Aug 1-6.
5. Kratz, C.J., E.A. Lilleskov, A.J. Burton, S. Butler, and J.M. Melillo. 2010. Physiological responses of fungi to soil warming. Poster presentation and published abstract, annual meeting of the Ecological Society of America, Pittsburgh, PA, Aug 1-6.
6. Melillo, J.M., S.M. Butler, R.M. Smith, C.L. Vario, A.J. Burton, Y. Zhou, J. Tang, J.E. Johnson, and J. Mohan. 2010. Effects of soil warming on the carbon cycle at the Harvard Forest, Massachusetts, USA. Oral presentation and published abstract, annual meeting of the Ecological Society of America, Pittsburgh, PA, Aug 1-6.
7. Smith, R.M., J.M. Melillo, S.M. Butler, C.L. Vario, A.J. Burton, Y. Zhou, J. Tank, J.E. Johnson, and J.E. Mohan. 2010. Effects of soil warming on the carbon cycle at the Harvard Forest. Twentieth Annual Harvard Forest Ecology Symposium. Petersham, MA, Harvard Forest, Mar 16. [Abstract](#)
8. Talhelm, A.F., K.S. Pregitzer, A.J. Burton, and D.R. Zak. 2010. Air pollution, emissions regulations, and long-term changes in regional forest biogeochemistry. Oral presentation and

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9. Burton, A.J., K.S. Pregitzer, D.F. Karnosky, K.S. Pregitzer, K.E. Percy, N.D. Nelson, A. Rogers, J. Nagy, M.E. Kubiske, R.L. Lindroth and D.R. Zak. 2009. Impacts of elevated CO₂ and O₃, alone and in combination, on the structure and functioning of a northern forest ecosystem: Aboveground tree responses. U.S. Department of Energy Program for Ecosystem Research (PER) 2009 Investigator Meeting, Arlington, VA, Nov 17-18. (invited)
10. Burton, A.J. 2009. Longer growing seasons and chronic nitrogen deposition increase productivity and alter soil carbon storage in Lake States northern hardwood forests. Carbon in Northern Forests: Integration of Research and Management, Traverse City, MI, June 10-11. (invited)
11. Burton, A., S. Frey and J. Melillo. 2009. Response of fine root respiration rates and root N to soil warming in hardwood forests. Nineteenth Annual Harvard Forest Ecology Symposium. Petersham, MA, Harvard Forest, Mar 17. [Abstract](#)
12. Burton, A.J., S.D. Frey, A.R. Contosta, J.M. Melillo, and S. Butler. Adjustment of fine root respiration rates to soil warming in hardwood forests. 2008. Poster presentation and published abstract, annual meeting of the Ecological Society of America, Milwaukee, WI, Aug 3-8.
13. Burton, A.J., K.S. Pregitzer, J.S. King, and D.R. Zak. 2008. Soil respiration, root biomass, and root turnover at the Aspen FACE study. Invited oral presentation and published abstract, Facing The Future: A Joint Meeting of AspenFACE, SoyFACE, and SFB 607, Rhinelander, WI, April 2-4.
14. Burton, A., S. Frey and J. Melillo. 2008. Adjustment of fine root respiration rates to soil warming in hardwood forests. Eighteenth Annual Harvard Forest Ecology Symposium. Petersham, MA, Harvard Forest, Mar 18. [Abstract](#)
15. Burton, A.J., K.S. Pregitzer, and D.R. Zak. 2007. Changes in northern hardwood growing season length and productivity during an 18-year warming trend. Poster presentation and published abstract, annual meeting of the Ecological Society of America, San Jose, CA, Aug 5-10.
16. Talhelm, A.F., K.S. Pregitzer, and A.J. Burton. 2007. Chronic nitrogen additions and photosynthetic gas exchange in sugar maple: Instantaneous measurements and a stable isotope chronosequence. Oral presentation and published abstract, annual meeting of the Ecological Society of America, San Jose, CA, Aug 5-10.
17. Burton, A.J. 2006. Root system responses to chronic N additions. Invited oral presentation and published abstract, annual meeting of the Soil Science Society of America, Indianapolis, Indiana, Nov 12-16.
18. Smemo, K.A., D.R. Zak, K.S. Pregitzer, and A.J. Burton. 2005. Qualitative chemistry of dissolved organic carbon exports from northern hardwood forests in response to chronic experimental nitrate deposition. Oral presentation and published abstract, annual meeting of the Soil Science Society of America, Salt Lake City, Utah, Nov 6-10.

19. Burton, A.J. and J.W. Culclasure. 2005. Root respiration and biomass in the forest floor and surface mineral soil of northern hardwood forests receiving chronic N additions. Poster presentation and published abstract, annual meeting of the Ecological Society of America, Montreal, QC, Aug 7-12.
20. Brown, S.E., A.J. Burton, A.L. Pickett, and K.S. Pregitzer. 2005. A field comparison of two dynamic chamber instruments for measuring forest soil respiration. Poster presentation and published abstract, annual meeting of the Ecological Society of America, Montreal, QC, Aug 7-12.
21. Rothstein, D.E., A.J. Burton, D.R. Zak, and K.S. Pregitzer. 2005. Effects of long-term nitrogen amendment on leaf and wood decomposition in northern hardwood forests. Poster presentation and published abstract, annual meeting of the Ecological Society of America, Montreal, QC, Aug 7-12.
22. Burton, A.J., and K.S. Pregitzer. 2004. Tree mortality and decay in northern hardwood forests. Oral presentation and published abstract, annual meeting of the Soil Science Society of America, Seattle, Washington, Oct. 31-Nov. 4.
23. Burton, A.J., and K.S. Pregitzer. 2004. Soil respiration in common North American forests: interactive effects of temperature, moisture and nitrogen availability. Oral presentation and published abstract, 18th North American Forest Biology Workshop, Michigan Technological University, Houghton, Michigan, July 12-15.
24. Burton, A.J., and K.S. Pregitzer. 2003. Root and microbial contributions to soil CO₂ efflux in northern hardwood forests with and without chronic N additions. Presentation and published abstract, annual meeting of the Soil Science Society of America, Denver, Colorado, Nov. 2-6.
25. Crawford, J.N., K.S. Pregitzer, A.J. Burton, and D.R. Zak. 2002. Effect of experimental N-additions on soil and root respiration in northern hardwood stands. Presentation and published abstract, annual meeting of the Ecological Society of America, Tucson, Arizona, Aug. 5-9.
26. Eikenberry, J.R., K.S. Pregitzer, A.J. Burton, and D.R. Zak. 2002. Chronic N effects on root and leaf litter chemistry of northern hardwood forests. Presentation and published abstract, annual meeting of the Ecological Society of America, Tucson, Arizona, Aug. 5-9.
27. Pregitzer, K.S., and A.J. Burton. 2002. The Michigan gradient study – Evaluation of nutrient cycling processes along a gradient of temperature and N deposition. Presentation at the Terrestrial Ecosystem Responses to Atmospheric and Climatic Change (TERACC) workshop: From Transient to Steady State Response of Ecosystems to CO₂-Enrichment and Global Warming, Durham, New Hampshire, Apr. 28 – May 1.
28. Burton, A.J. 2001. Belowground C and N fluxes along a climatic gradient in Olympic NP. Presentation at PRIMENet annual meeting, Hawaii Volcanoes National Park, Nov. 5-8.
29. Burton, A.J., K.S. Pregitzer, and K.L. Bradley. 2001. Spatial and temporal variation of soil respiration in a pinyon-juniper woodland. Poster presentation and published abstract, annual meeting of the Ecological Society of America, Madison, Wisconsin, Aug 5-10.

30. Kane, E.S., K.S. Pregitzer, and A.J. Burton. 2001. Soil CO₂ efflux along a diverse environmental gradient in Olympic National Park, Washington. Poster presentation and published abstract, annual meeting of the Ecological Society of America, Madison, Wisconsin, Aug. 5-10.
31. Pregitzer, K.S., A.J. Burton, R.W. Ruess, R.L. Hendrick, and M.F. Allen. 2001. Soil temperature, moisture, and nitrogen interact to influence soil respiration in North American forests. Poster presentation and published abstract at the International Geosphere-Biosphere Programme (IGBP) global change open science conference: Challenges of a Changing Earth, Amsterdam, Netherlands, July 10-13.
32. Burton, A.J., K.S. Pregitzer, G.P. Zogg, and D.R. Zak. 2000. Northern hardwood soil respiration after six years of N additions. Poster presentation and published abstract, annual meeting of the Soil Science Society of America, Minneapolis, Minnesota, Nov. 5-9.
33. Burton, A.J., and K.S. Pregitzer. 2000. Field measurements of root respiration in sugar maple and red pine forests indicate no temperature acclimation. Poster presentation and published abstract, annual meeting of the Ecological Society of America, Snowbird, Utah, Aug. 6-10.
34. Burton, A.J., and K.S. Pregitzer. 1999. Fine root respiration rates in North American forests. Poster presentation at Sevilleta Research Symposium, Sevilleta National Wildlife Refuge, New Mexico, January 12-14.
35. Zogg, G.P., D.R. Zak, A.J. Burton, and K.S. Pregitzer. 1999. Belowground fate and flow of nitrate in a northern hardwood forest. Presentation and published abstract, annual meeting of the Ecological Society of America, Spokane, Washington, Aug. 8-12.
36. Burton, A.J., and K.S. Pregitzer. 1998. Fine root respiration rates in North American forests. Poster presentation and published abstract, annual meeting of the Soil Science Society of America, Baltimore, Maryland, Oct. 18-22.
37. Burton, A.J. K.S. Pregitzer, G.P. Zogg, and D.R. Zak. 1997. Belowground carbon allocation in sugar maple forests with differing nitrogen availability. Presentation and published abstract, annual meeting of the Soil Science Society of America, Anaheim, California, Oct. 26-30.
38. Burton, A.J., K.S. Pregitzer, G.P. Zogg, and D.R. Zak. 1997. Drought reduces root respiration in sugar maple forests. Presentation and published abstract, annual meeting of the Ecological Society of America, Albuquerque, New Mexico, Aug. 10-14.
39. Pregitzer, K.S., M.J. Laskowski, A.J. Burton, and V.C. Lessard. 1997. Variation in northern hardwood root respiration with root diameter and soil depth. Poster presentation and published abstract, annual meeting of the Ecological Society of America, Albuquerque, New Mexico, Aug. 10-14.
40. Zogg, G.P., D.R. Zak, A.J. Burton, and K.S. Pregitzer. 1996. The contribution of fine roots to carbon dioxide flux from forest soils. Presentation and published abstract, annual meeting of the Soil Science Society of America, Indianapolis, Indiana, Nov. 3-8.

41. Burton, A.J., K.S. Pregitzer, and G.P. Zogg. 1995. Latitudinal variation in sugar maple fine root respiration. Presentation and published abstract, annual meeting of the Ecological Society of America, Snowbird, Utah, July 30-Aug. 3.
42. Burton, A.J., K.S. Pregitzer, and G.P. Zogg. 1995. Temperature and nitrogen effects on fine root longevity in sugar maple forests. Presentation and published abstract, annual meeting of the Soil Science Society of America, St. Louis, Missouri, Oct. 29-Nov. 3.
43. Zogg, G.P., D.R. Zak, A.J. Burton, and K.S. Pregitzer. 1995. Patterns of fine-root respiration in northern hardwood forests in relation to temperature and nitrogen availability. Presentation and published abstract, annual meeting of the Ecological Society of America, Snowbird, Utah, Aug. 6-10 .
44. Burton, A.J., K.S. Pregitzer, and N.W. MacDonald. 1993. Insect defoliation effects on northern hardwood nutrient cycling. Presentation and published abstract, annual meeting of the Soil Science Society of America, Cincinnati, Ohio, Nov. 7-12.
45. MacDonald, N.W., J.A. Witter, A.J. Burton, K.S. Pregitzer, and D.D. Richter. 1992. Relationships among atmospheric deposition, throughfall, and soil properties in oak forest ecosystems. Presentation and published abstract, annual meeting of the Soil Science Society of America, Minneapolis, Minnesota, Nov. 1-6.
46. MacDonald, N.W., A.J. Burton, H.O. Liechty, G.D. Mroz, and J.A. Witter. 1991. Soil solution chemistry and ion leaching in northern hardwood forests across an 800 km pollution gradient. Poster presentation and published abstract at Emerging Issues in Northern Hardwood Management: Air Pollution, Climate Change and Biodiversity, Mackinac Island, Michigan, May 20-23.
47. Pregitzer, K.S., A.J. Burton, G.D. Mroz, H.O. Liechty, and N.W. MacDonald. 1991. Northern hardwood foliar stoichiometry across an 800-km pollution gradient. Presentation and published abstract at Emerging Issues in Northern Hardwood Management: Air Pollution, Climate Change and Biodiversity, Mackinac Island, Michigan, May 20-23.
48. MacDonald, N.W., A.J. Burton, M.F. Jurgensen, and J.W. McLaughlin. 1990. Variation in soil properties along an air pollution gradient in the northern Great Lakes region. Presentation and published abstract, annual meeting of the Soil Science Society of America, San Antonio, Texas, Oct. 21-26.
49. Mroz, G., A. Burton, O. Hua, M. Jurgensen, H. Liechty, N. MacDonald, K. Pregitzer, D. Reed, R. Stottley, J. Witter, and D. Zak. 1990. Effects of an air pollution gradient on northern hardwood forests in the northern Great Lakes Region: Part 2 - Nutrient cycling and forest productivity. Presentation and published abstract at the NAPAP International Conference, Hilton Head, SC, Feb. 11-16.
50. Witter, J., G. Mroz, K. Pregitzer, A. Burton, M. Jurgensen, D. Karnosky, H. Liechty, N. MacDonald, D. Reed, D. Richter, R. Stottley, and D. Zak. 1990. Effects of an air pollution gradient on northern hardwood forests in the northern Great Lakes Region: Part 1 - Overview. Presentation and published abstract at the NAPAP International Conference, Hilton Head, South Carolina, Feb. 11-16.

51. Burton, A.J., and K.S. Pregitzer. 1989. Specific leaf area and leaf area index in Great Lakes northern hardwood forests. Presentation and published abstract, annual meeting of the Ecological Society of America, Toronto, Ontario, Canada, Aug. 6-10.
52. Mroz, G.D., D.D. Reed, J.A. Witter, K.S. Pregitzer, M.F. Jurgensen, H.O. Liechty, A.J. Burton, J.R. Stottleyer, N.W. MacDonald, D.R. Zak, and O. Hua. 1989. Effects of an air pollution gradient on northern hardwood forests in the northern Great Lakes Region: Part 2 - Nutrient cycling and forest productivity. Poster presentation and published abstract at International Congress on Forest Decline Research: State of Knowledge and Perspectives, Friedrichshafen, Lake Constance, Federal Republic of Germany, Oct. 2-6.
53. Witter, J., G. Mroz, K. Pregitzer, A. Burton, M. Jurgensen, D. Karnosky, H. Liechty, N. MacDonald, D. Reed, D. Richter, R. Stottleyer, and D. Zak. 1989. Effects of an air pollution gradient on northern hardwood forests in the northern Great Lakes Region: Part 1 - Overview. Poster presentation and published abstract at International Congress on Forest Decline Research: State of Knowledge and Perspectives: Friedrichshafen, Lake Constance, Federal Republic of Germany, Oct. 2-6.
54. Hendrick, R.L., K.S. Pregitzer, A.J. Burton, and P.V. Nguyen. 1988. Fine root dynamics in northern hardwood forests along an acid deposition gradient. Poster presentation and published abstract, annual meeting of the Soil Science Society of America, Anaheim, California, Nov. 27-Dec. 2.
55. Liechty, H., A. Burton, M. Jurgensen, G. Mroz, K. Pregitzer, D. Reed, D. Richter, R. Stottleyer, and J. Witter. 1988. Relationships of throughfall chemistry to precipitation in six northern hardwood stands along a sulfate deposition gradient. Poster presentation at International Symposium on Acidic Deposition and Forest Decline, Rochester, New York, Oct. 20-21.
56. Burton, A.J., J.B. Hart, Jr., and D.H. Urie. 1985. Sludge nitrogen form and acidity effects on nitrogen transformations in Michigan forest soils. Presentation and published abstract, annual meeting of the Soil Science Society of America, Chicago, Illinois, Dec. 1-6.
57. Burton, A., D. Urie, and J.B. Hart, Jr. 1985. Nitrogen cycling and potential nitrate groundwater pollution. Presentation and published summary at Conference on Forest Land Application of Wastewater Sludge, Grayling, Michigan, Sep. 11-12.
58. Burton, A.J. 1985. Nitrogen transformations in four sludge-amended Michigan forest types. Poster presentation and published abstract, Forest Land Applications Symposium, Univ. of Washington, Seattle, June 25-28.

Other Presentations:

1. Burton, A.J. 2010. Lectures and field presentations on: acid rain, N deposition and N saturation; climate change, temperature and moisture; the FACE experiment, and designing global change experiments to high school teachers attending Global Change Teacher Institute. Houghton, Michigan, July 19-23.
2. Burton, A.J. 2010. Lectures and field presentations on weather and climate, site quality and productivity, at the Michigant Tech sponsored National Advanced Silviculture Program Lake

- States Silviculture Module for U.S. Forest Service personnel. Houghton, Michigan, Jun 9-10. (invited)
3. Burton, A.J. 2010. Lectures and field presentations on geology, landforms and soils, at the Michigan Tech sponsored National Advanced Silviculture Program Ecological Systems Module for U.S. Forest Service personnel. Houghton, Michigan, May 11-12. (invited)
 4. Burton, A.J. 2010. Observable evidence of a warming climate. Ottawa National Forest Earth Day Symposium. Gogebic Community College, Ironwood, Michigan, Apr 22. (invited)
 5. Airoidi, A., and A.J. Burton. 2010. Treeline fluctuation in response to land use and climate change. Poster and published abstract, 6th Annual Graduate Research Forum, School of Forest Resources and Environmental Science, Michigan Technological University, Houghton, MI, Mar 26.
 6. Ebanyenle, E., A.J. Storer, and A.J. Burton . 2010. Effects of shoot borer attack on wood anatomical properties of mahogany. Poster and published abstract, 6th Annual Graduate Research Forum, School of Forest Resources and Environmental Science, Michigan Technological University, Houghton, MI, Mar 26.
 7. Jarvey, J., and A.J. Burton. 2010. Northern hardwood root respiration in response to chronic N addition. Poster and published abstract, 6th Annual Graduate Research Forum, School of Forest Resources and Environmental Science, Michigan Technological University, Houghton, MI, Mar 26.
 8. Jarvi, M., and A.J. Burton. 2010. Temperature acclimation of fine roots to soil warming in a sugar maple hardwood forest. Poster and published abstract, 6th Annual Graduate Research Forum, School of Forest Resources and Environmental Science, Michigan Technological University, Houghton, MI, Mar 26.
 9. Kratz, K., E.A. Lilleskov and A.J. Burton. 2010. Physiological responses of fungi to soil warming. Poster and published abstract, 6th Annual Graduate Research Forum, School of Forest Resources and Environmental Science, Michigan Technological University, Houghton, MI, Mar 26.
 10. Yeboah, D., A.J. Storer, and A.J. Burton. 2010. Variation in carbon of selected tropical trees species from Ghana. Poster and published abstract, 6th Annual Graduate Research Forum, School of Forest Resources and Environmental Science, Michigan Technological University, Houghton, MI, Mar 26.
 11. Burton, A.J. 2010. Ecosystem responses to global change. TACCT: Training in Advanced Climate Change Topics. Pyle Center, Madison, WI, Mar 17. (invited)
 12. Burton A.J. 2009. An introduction to global change issues. Lecture presentation to Jeffers High School science and math teachers, Painesdale, Michigan, Dec 23. (invited)
 13. Burton, A.J. 2009. Belowground responses to climate. Hanover Forest Science Seminar Series, Michigan State University, Department of Forestry, East Lansing, Nov 10. (invited)
 14. Lectures and field presentations on: acid rain, N deposition and N saturation; climate change, temperature and moisture; the FACE experiment, and designing global change experiments

- to high school teachers attending Global Change Teacher Institute. Houghton, Michigan, July 13-17, 2009.
15. Lectures and field presentations on geology, landforms and soils, at the Michigan Tech sponsored National Advanced Silviculture Program Ecological Systems Module for U.S. Forest Service personnel. Houghton, Michigan, May 12-13, 2009.
 16. Airoidi, A., and A.J. Burton . 2009. Treeline fluctuation in response to land use and climate change. Poster and published abstract, 5th Annual Graduate Research Forum, School of Forest Resources and Environmental Science, Michigan Technological University, Houghton, MI, Feb 27.
 17. Lectures and field presentations on: acid rain, N deposition and N saturation; climate change, temperature and moisture; the FACE experiment, and designing global change experiments to high school teachers attending Global Change Teacher Institute. Houghton, Michigan, July 14, 16, 17 and 18, 2008.
 18. Lectures on weather and climate at the MTU sponsored National Advanced Silviculture Program Lake States Silviculture Module for U.S. Forest Service personnel. Houghton, Michigan, July 9, 2008.
 19. Lectures and field site quality and productivity, at the MTU sponsored National Advanced Silviculture Program Lake States Silviculture Module for U.S. Forest Service personnel. Houghton, Michigan, July 9, 2008.
 20. Lectures and field presentations on geology, landforms and soils, at the Michigan Tech sponsored National Advanced Silviculture Program Ecological Systems Module for U.S. Forest Service personnel. Houghton, Michigan, May 21-22, 2008.
 21. Burton, A.J. 2008 Tree physiology and carbon allocation responses to climate change. Invited oral presentation. Xi Sigma Pi Symposium on Ecosystems and Climate Change. Michigan Technological University, Houghton, MI. April 4, 2008.
 22. Lectures and field presentations on: acid rain, N deposition and N saturation; climate change, temperature and moisture; the FACE experiment, and designing global change experiments to high school teachers attending Global Change Teacher Institute. Houghton, Michigan, June 26-28, 2007.
 23. Lectures and field presentations on geology, landforms and soils, at the Michigan Tech sponsored National Advanced Silviculture Program Ecological Systems Module for U.S. Forest Service personnel. Houghton, Michigan, May 15-16, 2007.
 24. Lectures and field presentations on: acid rain, N deposition and N saturation; climate change, temperature and moisture; and designing global change experiments to high school teachers attending Global Change Teacher Institute. Houghton, Michigan, July 18, 19, and 21, 2006.
 25. Lectures and field presentations on weather and climate, site quality and productivity, and hydrology at the MTU sponsored Program of Advanced Studies in Silviculture for U.S. Forest Service personnel. Houghton, Michigan, May 16 and 24, 2006.
 26. Lectures and field presentations on soils, tree physiology (root growth and crown growth), nutrient cycling, and climate and air quality at the MTU sponsored Program of Advanced

- Studies in Silviculture for U.S. Forest Service personnel. Alberta, Michigan, July 18 and 19, 2005.
27. Lectures and field presentations on: acid rain, N deposition and N saturation; climate change, temperature and moisture; and designing global change experiments to high school teachers attending Global Change Teacher Institute. Alberta, Michigan, July 11, 12, 14 and 15, 2005.
 28. Lectures and field presentations on plant identification and forest measurements to high school teachers attending Forest Resources and Environmental Science Teacher Institute. Alberta, Michigan, June 27, 2005.
 29. Lectures and field presentations on plant identification and forest measurements to high school teachers attending Forest Resources and Environmental Science Teacher Institute. Alberta, Michigan, July 12, 2004.
 30. Lecture and field presentation on forest measurements to visiting Korean high school teachers. Alberta, Michigan, August 5 and 8, 2003.
 31. Lecture and field presentation on nutrient cycling and population, community and ecosystem ecology at the MTU sponsored Program of Advanced Studies in Silviculture for U.S. Forest Service personnel. Alberta, Michigan, September 13, 2002.
 32. Burton, A.J. 2002. Alteration of Belowground Carbon Cycling by Chronic Nitrate Additions to Northern Hardwood Forests. Invited presentation to the School of Forest Resources and Environmental Science, Michigan Technological University, Houghton, Michigan. April 30, 2002.
 33. Gave report on the MTU School of Forestry and Wood Products' soils related research activities at the Michigan Soil Survey Cooperators Meeting. East Lansing, Michigan, Mar 5, 2002.
 34. Gave field presentation on NSF Cross-Biome study to the Board of Trustees of the Great Lakes Forestry Alliance. Atlantic Mine, Michigan, October 10, 2001.
 35. Field presentation on the Michigan Gradient Study to attendees of IUFRO's 19th International Meeting for Specialists in Air Pollution Effects on Forest Ecosystems: Air Pollution, Global Change and Forests in the New Millennium. Twin Lakes, Michigan, May 31, 2000.
 36. Forest ecology training for Trees for Tomorrow high school students from Wisconsin. Houghton, Michigan, April 21, 2000.
 37. Lecture on effects of forest management on soil properties at the MTU sponsored Program of Advanced Studies in Silviculture for U.S. Forest Service personnel. Alberta, Michigan, October 21, 1999.

Professional Service

University Committee and Administrative Service:

Director, Ecosystem Science Center, December 2008 to present

University Assessment Council Member, December 2010 to present

Graduate Studies Committee, School of Forest Resources and Environmental Science, August 2008 to present (Chair in 2010/2011 academic year)

Supervisor of the Forest Ecology Analytical Laboratory (managed by Jennifer Eikenberry), which provides analytical services within and outside the University on a fee per sample basis. Analytical capabilities include elemental analysis of solids (C, N, S, O), stable isotopes of C and N in solid, liquid and gas samples, gas chromatography (CO₂, CH₄, PLFAs), rapid flow analysis of NO₃⁻, NH₄⁺, and PO₄³⁻ in liquids. In January 2011 we purchased (with ESC, REF-IE, and Burton IRAD funds) an ICP-OES and microwave digester for analysis of multiple elements (trace metals, cations) in solids and liquids

Member of Host Committee for two candidates for the Strategic Hiring Initiative in Sustainability (Spring 2008)

Member of the Presidential Committee on University Safety and Environmental Health, 1998 to present.

Chemical Hygiene Officer, School of Forest Resources and Environmental Science, 1998 to present.

National Committee and Administrative Service:

Aspen FACE co-Director and member of Aspen FACE Steering Committee (November 2008 to present)

Director of the Midwestern Regional Center of the DOE National Institute for Climatic Change Research (June 2007 to present)

Assistant Director of the Midwestern Regional Center of the DOE National Institute for Climatic Change Research (December 2005 to June 2007)

Elected in October 2010 to a 3-year term of office as a member of the ESA Board of Professional Certification (term commences in August 2011)

Moderated session at the North American Forest Biology Workshop (July 13, 2004)

Moderated session at the Carbon in Northern Forests meeting in Traverse City (June 11, 2009)

Co-organizer for Carbon in Northern Forests meeting and field in Traverse City, Michigan June 10-12, 2009.

Member of professional societies:

Society of American Foresters
Ecological Society of America
Soil Science Society of America
Council on Undergraduate Research
Agronomy Society of America

Manuscript reviews for: (numbers in parentheses indicate multiple reviews for that year)

American Midland Naturalist 2002
Annals of Forest Science 2009
Canadian Journal of Forest Research 1993 (2), 2001
Ecological Applications 2010
Ecology/Ecological Monographs 1999, 2006
Forest Ecology and Management 2005 (3)
Forest Science 1993 (2), 2002, 2003 (2), 2004 (2), 2006, 2007, 2009 (4), 2010 (4)
Global Change Biology 2003 (3), 2004 (6), 2005, 2006, 2007, 2009, 2010
Journal of Applied Entomology 2007 (2)
Journal of Geophysical Research – Biogeosciences 2010
Journal of Ecology 2007
Journal of Integrative Plant Biology 2008 (2)
Journal of Forest Research (Japan) 2006
Journal of the Torrey Botanical Society 1999, 2005
The Ohio Journal of Science 1999
Plant Ecology 2001
Plant and Soil 2000, 2002, 2003, 2004, 2007, 2009, 2010
New Phytologist 2003 (2), 2004 (2), 2007, 2009
Northern Journal of Applied Forestry 2009
Soil Science Society of America Journal 2002, 2003, 2007
Soil Biology and Biochemistry 2010
Tree Physiology 2000, 2001 (3), 2002, 2005, 2008
Editorial Review Board of *Tree Physiology*, 2000 – 2002
Guest Editor for Special Issue of *Forest Science*, 2011

Proposal reviews proposals for:

- 2002: USDA NRI Soils and Soil Biology, NSF DEB
- 2003: USDA NRI Soils and Soil Biology (2), USDA NRI Plant Responses to the Environment, NSF DEB, NSF BE: Coupled Biogeochemical Cycles
- 2004: NSF DBI Undergraduate mentoring in biology, US Civilian Research and Development Foundation
- 2005: NSF DBI-REU, NSF DEB (2), NSF OISE (Global Scientists and Engineers)
- 2006 NSF DEB, NICCR Midwestern Regional Center (RFP01: 24 proposals, 260 preproposals)
- 2007 NSF DEB, NICCR Midwestern Regional Center (RFP02: 17 proposals, 141 preproposals), NICCR Midwestern Regional Center (RFP03: 15 proposals, 211 preproposals)
- 2008 NSF DEB, NSF DEB-RUI, NICCR Midwestern Regional Center (14 proposals, 217 preproposals)
- 2009 NSF DEB, NICCR Midwestern Regional Center (11 proposals, 151 preproposals), NSF IOS
- 2010 FWF (Austrian Science Foundation), NSF IOS

Public Service

Co-developer and primary instructor for the Global Change Teachers Institute held each summer at Michigan Tech. From 2004 through 2010, one hundred and five middle and high school teachers have learned the latest in global change news and research techniques during the one-week summer institute. Participants receive three graduate credits and visit active global change research locations as part of the Institute, extending knowledge of the research into many classrooms in the Lake States as well as locations in California, New York, Maryland, Missouri, Ohio, Illinois, Connecticut, and Mexico. One participant, Jenn Carlson, highlighted her experience in the Institute in a paper entitled "Thinking Like an Ecologist", published in 2008 in the National Science Teachers Association journal *The Science Teacher*.

Judge at the Western UP Science Fair for grade 7 and 8 science projects (March 2003, 2004 and 2005).

Taught forest measurements to visiting Korean High School teachers, August 5 and 8, 2003.

Taught middle and secondary school teachers plant ID and forest measurements as part of a Forestry Institute for secondary school teachers (July 2004 and 2005).

Arranged for participants at the REU Site that I directed to spend 8 person-days assisting the Summer Youth Program (SYP) at MTU during the summer of 2004. The REU students assisted SYP instructors in teaching ecology and environmental science to SYP students and also presented results of their research to the students.