

## DAVID J. BURKE-CURRICULUM VITAE

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### **Address**

David J. Burke, Ph.D.  
Scientist  
The Holden Arboretum  
9500 Sperry Road  
Kirtland OH 44094  
440-602-3858 (W)  
dburke@holdenarb.org

### **Education - Degrees**

Ph.D., 2001  
Biology with concentration in Ecology and Evolution; Rutgers University, Newark, NJ  
M.S., 1996  
Biology; East Stroudsburg University, East Stroudsburg, PA  
B.S., 1987  
Environmental Science; Rutgers University, New Brunswick, NJ

### **Education - Assistantships and Fellowships**

2005-2006	Department of Environmental and Forest Biology, State University of New York <i>Postdoctoral Associate</i>
2002-2004	Boyce Thompson Institute for Plant Research at Cornell University <i>Postdoctoral Associate</i>
2003	Center for Environmental Bioremediation, University of West Florida <i>Visiting Research Associate</i>
2001-2002	Department of Mechanical Engineering, New Jersey Institute of Technology <i>Postdoctoral Associate</i>
2001	Department of Biological Sciences, Rutgers University <i>Research Assistant</i>
1997-2000	Department of Biological Sciences, Rutgers University <i>Teaching Assistant/Graduate Assistant/Lecturer</i>

### **Education - Scholarships and Awards**

Teaching Assistantship, Department of Biological Sciences, Rutgers University, 1998-2000  
(\$48,000 total support)  
Polgar Fellowship, Hudson River Foundation, 1999 (\$5000)  
Greenfield Botany Fellowship, Rutgers University, 1998 (\$750)

Graduate Assistantship, Department of Biological Sciences, Rutgers University, 1997-1998 (\$24,000 total support)

### **Professional Experience**

- 2012-Present     The Holden Arboretum, *Research Chair*
- 2006-Present     The Holden Arboretum, *Scientist, Rhizosphere Biologist*
- 1995-1997        Yannaccone Associates, Inc., Chester, New Jersey, *Environmental Investigator*
- 1988-1995        Washington Township Health Department, Long Valley, New Jersey  
*Environmental Health Specialist*
- 1987-1988        Randolph Township Health Department, Randolph, New Jersey  
*Environmental Health Specialist*

### **Academic Appointments**

- 2012-Present     Department of Biological Sciences, Kent State University  
*Adjunct Assistant Professor of Biology*
- 2006-Present     Department of Biology, Case Western Reserve University  
*Adjunct Assistant Professor of Biology*

**Research Interests** – I study the interaction between plants and soil microorganisms, especially mutualistic and associative soil organisms that live in the root zone of plants such as mycorrhizal fungi. My work seeks to understand the factors that govern the diversity of soil organisms and their functional roles within natural systems.

### **Publications**

- [41] Burns JH, Brandt AJ, Murphy JE, Kaczowka AM, and **Burke DJ** (2017) Soil drivers of coexistence in *Rumex* congeners: spatial heterogeneity of plant-soil feedbacks increases invader fecundity. *Oecologia* 183, 1077–1086. [Times Cited: 0]
- [40] Carrino-Kyker SR, Coyle KP, Kluber LA, and **Burke DJ** (2016) Detection of phosphate transporter genes from arbuscular mycorrhizal fungi in acidic forest soils. *Symbiosis*. DOI 10.1007/s13199-016-0448-1. [Times Cited: 0]
- [39] **Burke DJ**, Knisely C, Watson ML, Carrino-Kyker SR, and Mauk RL (2016) The effects of agricultural history on forest ecological integrity as determined by a rapid forest assessment method. *Forest Ecology and Management* 378: 1–13. [Times Cited: 0]
- [38] Stoler AB, **Burke DJ**, and Relyea RA (2016) Litter chemistry and chemical diversity drive ecosystem processes in forest ponds. *Ecology* 97: 1783–1795. [Times Cited: 0]
- [37] Carrino-Kyker SR, Kluber LA, Petersen SM, Coyle KP, Hewins CR, DeForest JL, Smemo KA, and **Burke DJ** (2016) Effects of soil pH and P availability on root associated fungal communities in a temperate hardwood forest. *FEMS Microbiology Ecology* 92: DOI: <http://dx.doi.org/10.1093/femsec/fiw024>. [Times Cited: 0]

- [36] Krynak KL, **Burke DJ**, and Benard MF (2016) Landscape and water characteristics correlate with immune defense traits across Blanchard's cricket frog (*Acris blanchardi*) populations. *Biological Conservation* 193: 153–167. [Times Cited: 0]
- [35] **Burke DJ**, Pietrasiak N, Situ SF, Abenojar EC, Porche M, Kraj P, Lakliang Y, and Samia ACS (2015) Iron oxide and titanium oxide nanoparticle effects on plant performance and root associated microbes. *International Journal of Molecular Science* 16: 23630-23650; doi:10.3390/ijms161023630. [Times Cited: 7]
- [34] Krynak KL, **Burke DJ**, and Benard MF (2015) Larval environment alters amphibian immune defenses differentially across life stages and populations. *PLoS ONE* 10(6): e0130383. doi:10.1371/journal.pone.0130383. [Times Cited: 2]
- [33] **Burke DJ** (2015) Effects of annual and inter-annual environmental variability on soil fungi associated with an old-growth, temperate hardwood forest. *FEMS Microbiology Ecology* 91 (6): doi: 10.1093/femsec/fiv053. [Times Cited: 1]
- [32] Burns JH, Anacker BL, Strauss SY, **Burke DJ** (2015) Soil microbial community variation correlates most strongly with plant species identity, followed by soil chemistry, spatial location and plant genus. *AoB PLANTS* 7: plv030; doi:10.1093/aobpla/plv030. \*Honored as Editor's Choice. [Times Cited: 6]
- [31] Hewins CR, Carrino-Kyker SR, and **Burke DJ** (2015) Seasonal variation in mycorrhizal fungi on roots of *Allium tricoccum* (wild leek) in a mature mixed hardwood forest. *Mycorrhiza* 25: 469-483. [Times Cited: 2]
- [30] **Burke DJ**, Zhu S, Pablico-Lansigan MP, Hewins CR, and Samia ACS (2014). Titanium oxide nanoparticle effects on soil microbial communities and plant performance. *Biology and Fertility of Soils* 50: 1169-1173. [Times Cited: 11]
- [29] **Burke DJ**, Smemo KA, and Hewins CR (2014) Ectomycorrhizal fungi isolated from old-growth northern hardwood forest display variability in extracellular enzyme activity in the presence of plant litter. *Soil Biology and Biochemistry* 68: 219-222. [Times Cited: 8]
- [28] Pendergast TH, **Burke DJ**, and Carson WP (2013) Belowground biotic complexity drives aboveground dynamics: A test of the soil community feedback model. *New Phytologist* 197: 1300–1310. [Times Cited: 35]
- [27] Carrino-Kyker SR, Smemo KA, and **Burke DJ** (2013) Shotgun metagenomic analysis of metabolic diversity and microbial community structure in experimental vernal pools subjected to NO<sub>3</sub><sup>-</sup> pulse. *BMC Microbiology* 13:78. [Times Cited: 3]
- [26] Endreny TA, **Burke DJ**, Burchhardt KP, Fabian MW and Kretzer AM (2012) Soil column study of bacteria community response to salt enriched artificial stormwater. *Journal of Environmental Quality* 41 (6): 1951-1959. [Times Cited: 3]
- [25] Kluber LA, Carrino-Kyker SR, Coyle KP, DeForest JL, Hewins CR, Shaw AN, Smemo KA, and **Burke DJ** (2012) Mycorrhizal response to experimental pH and P manipulation in acidic hardwood forests. *PLoS ONE* 7(11): e48946. [Times Cited: 16]
- [24] **Burke DJ**, Smemo KA, López-Gutiérrez JC, and Hewins CR (2012) Soil enzyme activity in an old growth northern hardwood forest: interactions between soil environment, ectomycorrhizal fungi and plant distribution. *Pedobiologia* 55: 357-364. [Times Cited: 5]

- [23] **Burke DJ** (2012) Shared mycorrhizal networks of forest herbs: Does the presence of conspecific and heterospecific adult plants affect seedling growth and nutrient acquisition? *Botany* 90(10): 1048-1057. [Times Cited: 1]
- [22] **Burke DJ**, Smemo KA, López-Gutiérrez JC and DeForest JL (2012) Soil fungi influence the distribution of microbial functional groups that mediate forest greenhouse gas emissions. *Soil Biology and Biochemistry*, 53: 112-119. [Times Cited: 16]
- [21] Carrino-Kyker SR, Smemo KA, and **Burke DJ** (2012) The effects of pH change and NO<sub>3</sub><sup>-</sup> pulse on microbial community structure and function: a vernal pool microcosm study. *FEMS Microbiology Ecology*, 81: 660-672. [Times Cited: 10]
- [20] DeForest JL, Smemo KA, **Burke DJ**, Elliott HL, and Becker J (2012) Soil microbial responses to phosphorus addition and pH manipulation in acidic temperate deciduous forests. *Biogeochemistry*, 109:189–202. [Times Cited: 55]
- [19] **Burke DJ**, Weintraub MN, Hewins CR and Kalisz S (2011) Relationship between soil enzyme activities, nutrient cycling and soil fungal communities in a northern hardwood forest. *Soil Biology and Biochemistry*, 43: 795-803. [Times Cited: 50]
- [18] Carrino-Kyker SR, Swanson AK and **Burke DJ** (2011) Changes in eukaryotic microbial communities of vernal pools along an urban–rural land use gradient. *Aquatic Microbial Ecology*, 62: 13-24. [Times Cited: 5]
- [17] **Burke DJ** and Chan CR (2010) Effects of the invasive plant garlic mustard (*Alliaria petiolata*) on bacterial communities in a northern hardwood forest soil. *Canadian Journal of Microbiology*, 56: 81-86. [Times Cited: 9]
- [16] Welsh A, **Burke DJ**, Hamerlynck EP and Hahn D (2010) Seasonal analyses of arbuscular mycorrhizae, nitrogen-fixing bacteria and growth performance of the salt marsh grass *Spartina patens*. *Plant and Soil*, 330:251-266. [Times Cited: 18]
- [15] **Burke DJ**, López-Gutiérrez JC, Smemo KA and Chan CR (2009) Vegetation and soil environment influence the spatial distribution of root-associated fungi in a mature beech-maple forest. *Applied and Environmental Microbiology*, 75: 7639-7648. [Times Cited: 30]
- [14] **Burke DJ** (2008) Effects of *Alliaria petiolata* (Brassicaceae - garlic mustard) on mycorrhizal colonization and community structure in three herbaceous plants in a mixed deciduous forest. *American Journal of Botany*, 95: 1416-1425. [Times Cited: 52]
- [13] **Burke DJ**, Dunham SM and Kretzer AM (2008) Molecular analysis of bacterial communities associated with the roots of Douglas fir (*Pseudotsuga menziesii*) colonized by different ectomycorrhizal fungi. *FEMS Microbiology Ecology*, 65: 299-309. [Times Cited: 35]
- [12] Welsh A, **Burke DJ** and Hahn D (2007) Analysis of nitrogen-fixing members of the  $\epsilon$  subclass of Proteobacteria in salt marsh sediments. *Applied and Environmental Microbiology*, 73:7747-7752. [Times Cited: 10]
- [11] Suntornvongsagul K, **Burke DJ**, Hamerlynck EP and Hahn D (2007) Uptake and translocation of heavy metals in salt marsh sediments by *Spartina patens*. *Bulletin of Environmental Contamination and Toxicology*, 78: 275-279. [Times Cited: 3]
- [10] Suntornvongsagul K, **Burke DJ**, Hamerlynck EP and Hahn D (2007) Fate and effects of heavy metals in salt marsh sediments. *Environmental Pollution*, 149: 79-91. [Times Cited: 27]

[9] **Burke DJ**, Kretzer AM, Rygiewicz PT and Topa MA (2006) Soil bacterial diversity in a loblolly pine plantation: Influence of ectomycorrhizas and fertilization. *FEMS Microbiology Ecology*, 57: 409-419. [Times Cited: 37]

[8] **Burke DJ**, Martin KJ, Rygiewicz PT and Topa MA (2006) Relative abundance of ectomycorrhizas in a managed loblolly pine (*Pinus taeda* L.) genetics plantation as determined through terminal restriction fragment length polymorphism (TRFLP) profiles. *Canadian Journal of Botany*, 84: 924-932. [Times Cited: 20]

[7] **Burke DJ**, Martin KJ, Rygiewicz PT and Topa MA (2005) Ectomycorrhizal fungi identification in single and pooled root samples: terminal restriction fragment length polymorphism (TRFLP) and morphotyping compared. *Soil Biology and Biochemistry*, 37: 1683-1694. [Times Cited: 51]

[6] **Burke DJ**, Hamerlynck EP and Hahn D (2003) Interactions between the salt marsh grass *Spartina patens*, arbuscular mycorrhizal fungi and sediment bacteria during the growing season. *Soil Biology and Biochemistry*, 35: 501-511. [Times Cited: 43]

[5] Weis P, Windham L, **Burke DJ** and Weis JS (2002) Release into the environment of metals by two vascular salt marsh plants. *Marine Environmental Research*, 54: 1-5. [Times Cited: 51]

[4] **Burke DJ**, Hamerlynck EP and Hahn D (2002) Effect of arbuscular mycorrhizae on soil microbial populations and associated plant performance of the salt marsh grass *Spartina patens*. *Plant and Soil*, 239: 141-154. [Times Cited: 33]

[3] **Burke DJ**, Hamerlynck EP and Hahn D (2002) Interactions among plant species and microorganisms in salt marsh sediments. *Applied and Environmental Microbiology*, 68:1157-1164. [Times Cited: 101]

[2] **Burke DJ**, Weis JS and Weis P (2000) Release of metals by the leaves of the salt marsh grasses *Spartina alterniflora* and *Phragmites australis*. *Estuarine, Coastal and Shelf Science*, 51: 153-159. [Times Cited: 135]

[1] **Burke DJ** (1997) Donor wetland soil promotes re-vegetation in wetland trials. *Restoration and Management Notes*, 15: 168-172. [Times Cited: 16]

#### **Non-Peer Reviewed Publications**

[4] Petersen, SM, Cope CG, Donaldson JW, **Burke DJ** (2015) TRFLPR, doi.http://dx.doi.org/10.5281/zenodo.17126.

[3] **Burke DJ** (2001) The interaction between the grass *Spartina patens*, N<sub>2</sub>-fixing bacteria and arbuscular mycorrhizae in a Northeastern salt marsh. Ph.D. Thesis, Rutgers University, Newark, New Jersey. [Times Cited: 5]

[2] **Burke DJ** and Hahn D (2000) The effect of mycorrhizae on nitrogen-fixing bacteria associated with the salt marsh grass *Spartina patens*. Section II: 28 pp. In W.C. Nieder and J.R. Waldman (Eds.). Final Reports of the Tibor T. Polgar Fellowship Program, 1999. Hudson River Foundation, New York.

[1] **Burke DJ** (1996) The use of soil seed banks in the establishment of vegetation at wetland mitigation sites. M.S. Thesis, East Stroudsburg University, East Stroudsburg, Pennsylvania.

## **Grants Awarded**

NSF grant through Ecosystem Science Cluster entitled *LiT-Collaborative Research: What lies beneath: P limitation and soil microbial community composition in hardwood forests*. Amount: **\$318,383** (DEB 0918167). September 1, 2009. **Burke DJ** (PI) and Smemo KA (Co-PI).

Unfunded collaborator on NSF grant to Sharon Strauss (UC-Davis PI) and Jean Burns (CWRU Subcontractor). "To what degree does phylogenetic relatedness between species predict ecological similarity?" **\$549,918** (DEB 1120387).

## **Presentations - International and National Meetings**

**Burke DJ, and Carrino-Kyker SR** (2016) Location, location, location: Microsite environmental conditions not seasonality affect fungal communities in a temperate hardwood forest. ISME meeting, Montreal, CA, August 22-26.

Carrino-Kyker SR, Coyle KP, Kluber LA and **Burke DJ** (2016) Do seasonal changes affect the soil microbial community response to ecosystem level acidification? ISME meeting, Montreal, CA, August 22-26.

Krynak KL, **Burke DJ**, and Benard MF (2015) Practically non-toxic? The effects of Rodeo herbicide on *Acris blanchardi*. Amphibian Pathogens Annual Meeting, Arizona State University, October 31 - November 1.

**Burke DJ**, Coyle KP, Kluber LA, and Carrino-Kyker SR (2015) Do seasonal changes in temperature and precipitation alter soil microbial community response to ecosystem level acidification as determined by 454 pyrosequencing. 100<sup>th</sup> annual meeting of the Ecological Society of America, Baltimore MD, August 9-14.

Krynak KL, **Burke DJ**, and Benard MF (2015) Landscape and water characteristics correlate with immune defense trait differences across Blanchard's Cricket frog (*Acris blanchardi*) populations. 100<sup>th</sup> annual meeting of the Ecological Society of America, Baltimore MD, August 9-14.

Burns JH, Brandt AJ, Murphy JE, Kaczowka A, and **Burke DJ** (2015) Potential drivers of mutual invasibility in *Rumex* congeners. 100<sup>th</sup> annual meeting of the Ecological Society of America, Baltimore MD, August 9-14.

Cope CG, **Burke DJ**, Burns JH, Brandt AJ, Murphy JE, Kaczowka A, and (2015) The role of native ungulates and invasive earthworms in shaping plant and soil communities in northeast Ohio. 100<sup>th</sup> annual meeting of the Ecological Society of America, Baltimore MD, August 9-14.

Brouwer NL, Hale AN, Heckel CD, Spigler RB, **Burke D** and Kalisz S (2015) Experimental evidence links altered species interactions to native plant decline: Demographic consequences & physiological mechanisms. British Ecological Society Annual Symposium, Sheffield, UK, March 24-26.

Krynak KL, **Burke DJ**, and Benard MF (2014) What can an assessment of immune defense traits across a landscape tell us about Cricket frog health? Amphibian Pathogens Annual Meeting, Arizona State University, November 15-16.

- Burke DJ** (2014) Effects of annual and inter-annual environmental variability on soil fungi associated with an old-growth, temperate hardwood forest. 99<sup>th</sup> annual meeting of the Ecological Society of America, Sacramento CA, August 10-15.
- Burns JH, Anacker BL, Strauss SY, and **Burke DJ** (2014) Closely related plant species have similar soil fungal communities in their rhizosphere. 99<sup>th</sup> annual meeting of the Ecological Society of America, Sacramento CA, August 10-15.
- Krynak KL, Benard MF, and **Burke DJ** (2014) Are amphibian skin associated communities regulated by the host, the external environment, or both? 99<sup>th</sup> annual meeting of the Ecological Society of America, Sacramento CA, August 10-15.
- Kyker SR, Kluber LA, Petersen SM, Coyle KP, Hewins CR, DeForest JL, Smemo KA and **Burke DJ** (2014) Experimental pH and P manipulation alters root-associated fungal community structure in temperate hardwood forests. 99<sup>th</sup> annual meeting of the Ecological Society of America, Sacramento CA, August 10-15.
- Petersen SM, Albro SL, Drewa PB, Watson M, and **Burke DJ** (2014) Much ado about deer? 5-8 years of deer exclusion does not impact the understory plant community in temperate forests of northeastern Ohio. 99<sup>th</sup> annual meeting of the Ecological Society of America, Sacramento CA, August 10-15.
- Smemo KA, DeForest JL, Petersen SM, **Burke DJ**, Hewins CR, Kluber LA, and Carrino-Kyker SR (2013) Seasonal Belowground Ecosystem and Eco-enzymatic Responses to Soil pH and Phosphorus Availability in Temperate Hardwood Forests. 2013 AGU Fall, San Francisco CA, December 9-13. (Poster)
- DeForest JL, Smemo KA, Weintraub MN, **Burke DJ**, Carrino-Kyker SR, Hewins CR and Kluber LA (2013) Shifts in forest soil enzyme stoichiometry due to season, pH, and phosphorus availability. 98<sup>th</sup> annual meeting of the Ecological Society of America, Minneapolis Minnesota, August 4-8.
- Petersen SM, Carrino-Kyker SR, DeForest JL, Smemo KA, Hewins CR, Shaw A and **Burke DJ** (2013) Tree responses to experimental pH and phosphorus elevation in acidic temperate hardwood forests. Botanical Society of America Meeting, New Orleans, LA, July 27-August 1.
- Burke DJ**, Carrino-Kyker SR, Kluber LA, Petersen SM, Coyle KP, DeForest JL, Smemo KA and Hewins CR (2013) Effects of soil pH and P availability on root associated fungal communities in a temperate hardwood forest. Botanical Society of America Meeting, New Orleans, LA, July 27- August 1.
- Kyker SR, Kluber LA, Hewins CR, Coyle KP, **Burke DJ** and Smemo KA (2012) Regulation of Arbuscular Mycorrhizal Phosphate Transporter Genes in Acidic Forest Soils. Soil Science Society of America Meeting, Cincinnati OH, October 21-24 (Poster).
- Kyker SR, Kluber LA, **Burke DJ**, DeForest JL and Smemo KA (2012) Experimentally reversing soil acidification in NE hardwood forests: soil microbial and biogeochemical responses. Fourth International Ecosummit, Columbus OH, September 30 – October 5 (Poster).
- DeForest JL, Shaw AN, Kluber LA, **Burke DJ**, Kyker SR, and Smemo KA (2012) Are maples limited by phosphorus in unglaciated forests? 97<sup>th</sup> annual meeting of the Ecological Society of America, Portland OR, August 5-10.

- Hewins CR and **Burke DJ** (2012) Seasonal variation of fungal communities on roots of *Allium tricoccum* (wild leek) in a mature mixed hardwood forest. 97<sup>th</sup> annual meeting of the Ecological Society of America, Portland OR, August 5-10. (Poster)
- Burke DJ** (2012) Shared mycorrhizal networks of forest herbs: Does the presence of conspecific and heterospecific adult plants affect seedling growth and nutrient acquisition? Botanical Society of America Meeting, Columbus OH, July 8-12. (Poster)
- DeForest JL, Shaw AN, Kluber LA, **Burke DJ**, Kyker SR, and Smemo KA (2011) Phosphorus constrains accelerated nitrogen cycling in limed acidic forests. 2011 AGU Fall, San Francisco CA, December 5-9. (Poster)
- Kluber LA, Carrino-Kyker SR, Elliott HL, Shaw AN, Hewins CR, Smemo KA, DeForest JL and **Burke DJ** (2011) What's P got to do with it? Mycorrhizal and biochemical response to P and lime additions in acidic hardwood forests. Ninety-sixth annual meeting of the Ecological Society of America, Austin, Texas, August 7-12. (Poster)
- Carrino-Kyker SR, **Burke DJ** and Smemo KA (2011) Metagenomic Analysis of Microbial Community Structure and Metabolic Diversity in Experimental Vernal Pools with and without NO<sub>3</sub><sup>-</sup> Addition. Ninety-sixth annual meeting of the Ecological Society of America, Austin, Texas, August 7-12. (Poster)
- Burke DJ** (2011) Plants and parenthood: Do plants facilitate the success of their own offspring through a shared mycorrhizal network? Ninety-sixth annual meeting of the Ecological Society of America, Austin, Texas, August 7-12. (Poster)
- DeForest JL, Smemo KA and **Burke DJ** (2010) Crossing the pedogenic threshold: Apparent phosphorus limitation by soil microorganisms in unglaciated acidic eastern hardwood forests. 2010 AGU Fall, San Francisco CA, December 13-17 (Poster).
- Smemo KA, DeForest JL, **Burke DJ**, Elliot HL, Kluber LA and Carrino-Kyker SR (2010) P limitation and microbial biogeochemistry in acidic forest soils of the northeastern United States. 2010 AGU Fall, San Francisco CA, December 13-17 (Poster).
- Burke DJ**, López-Gutiérrez JC, DeForest JL and Smemo KA (2010) Can soil fungi affect bacterial functional groups that mediate greenhouse gas emission in forests? Ninety-fifth annual meeting of the Ecological Society of America, Pittsburgh, Pennsylvania, August 1-6 (Poster).
- Carrino-Kyker SR, **Burke DJ**, López-Gutiérrez JC and Smemo KA (2010) Response and function of vernal pool microbial communities to environmental change: A microcosm study. Ninety-fifth annual meeting of the Ecological Society of America, Pittsburgh, Pennsylvania, August 1-6.
- Benard MF, Carrino-Kyker SR and **Burke DJ** (2010) Effects of intraspecific genetic diversity on ecological communities are context-dependent. Ninety-fifth annual meeting of the Ecological Society of America, Pittsburgh, Pennsylvania, August 1-6 (Poster).
- Smemo KA, Blackwood CB, **Burke DJ** and Kershner MW (2009) Linking litter decomposition processes and microbial community composition in northern hardwood forest soils. Ninety-fourth annual meeting of the Ecological Society of America, Albuquerque, New Mexico, August 2-7.



- Kretzer AM, Bai S, King ZR, Dunham SM and **Burke DJ** (2008) Molecular analysis of bacterial communities associated with Douglas-fir (*Pseudotsuga menziesii*) ectomycorrhizae from Oregon. Mycological Society of America Meeting, State College, Pennsylvania, August 9-13.
- Burke DJ**, Chan CR, López-Gutiérrez JC and Smemo KA (2008) The diversity of ectomycorrhizal fungi in a mature beech-maple forest: Influences of soil environment and vegetation. Ninety-third annual meeting of the Ecological Society of America, Milwaukee, Wisconsin, August 3-8.
- DeForest JL and **Burke DJ** (2008) Acid deposition: Reduced base saturation, available phosphorous, and changed fungal community composition in an old-growth forest. Ninety-third annual meeting of the Ecological Society of America, Milwaukee, Wisconsin, August 3-8.
- Carrino-Kyker SR and **Burke DJ** (2008) The response of vernal pool microbial communities to environmental fluctuation and land use patterns. Ninety-third annual meeting of the Ecological Society of America, Milwaukee, Wisconsin, August 3-8 (Poster).
- Chan CR, **Burke DJ** and Kalisz S (2008) The effects of deer herbivory and the invasive plant garlic mustard (*Alliaria petiolata*) on fungal community diversity in a mixed mesophytic forest. Ninety-third annual meeting of the Ecological Society of America, Milwaukee, Wisconsin, August 3-8 (Poster).
- López-Gutiérrez JC, **Burke DJ**, Chan CR, Smemo KA and Barratt N (2008) Is soil enzyme activity related to the identity of ectomycorrhizal fungi colonizing tree roots in a northern hardwood forest? Ninety-third annual meeting of the Ecological Society of America, Milwaukee, Wisconsin, August 3-8 (Poster).
- Smemo KA, **Burke DJ**, López-Gutiérrez JC and Chan CR (2008) Seasonal patterns and environmental controls on extracellular enzyme activity in a northern hardwood forest soil. Ninety-third annual meeting of the Ecological Society of America, Milwaukee, Wisconsin, August 3-8.
- Mahaney WM, Smemo KA and **Burke DJ** (2008) Do plant species influence soil microbial community responses to inputs of different quality litter? Ninety-third annual meeting of the Ecological Society of America, Milwaukee, Wisconsin, August 3-8 (Poster).
- Chan CR and **Burke DJ** (2007) Invasive garlic mustard (*Alliaria petiolata*) alters soil bacterial communities in a northern hardwood forest soil. Ninety-second annual meeting of the Ecological Society of America, San Jose, California, August 5-10 (Poster).
- Topa MA, **Burke DJ** and Chapin C (2005) Biocontrol of purple loosestrife by the leaf-feeding beetle *Galerucella*: Potential cumulative effects on whole-plant carbon budgets. Ninetieth annual meeting of the Ecological Society of America, Montreal, Quebec, August 7-11 (Poster).
- Burke DJ**, Topa MA and Kretzer AM (2005) Bacterial diversity in soil associated with ectomycorrhizal root tips of loblolly pine: effects of long-term fertilization. Ninetieth annual meeting of the Ecological Society of America, Montreal, Quebec, August 7-11.
- Burke DJ**, Martin KJ, Rygielwicz PT and Topa MA (2004) Ectomycorrhizal diversity in a loblolly pine (*Pinus taeda* L.) genetics plantation: Influence of host origin and

fertilization. Eighty-ninth annual meeting of the Ecological Society of America, Portland, Oregon, August 1-6.

**Burke DJ**, Martin KJ, Rygielwicz PT and Topa MA (2003) Utilization of TRFLP to characterize mixed ectomycorrhizal fungal communities. Third International Symposium on Dynamics and Physiological Processes of Woody Roots, University of Western Australia, Perth, Australia, September 29-October 3 (Poster).

**Burke DJ**, Weis JS and Weis P (1999) Excretion of metals by the salt marsh grasses *Spartina alterniflora* and *Phragmites australis*. Fifteenth Biennial International Conference of the Estuarine Research Federation, New Orleans, September 25-30.

### **Presentations - Regional and Local Meetings**

Lance AC, Hausman CE, **Burke DJ**, and Burns JH (2016) Temperate tree response to microbial inoculation during restoration. 8<sup>th</sup> Annual Cleveland Metroparks Natural Resources Research Meeting, Cleveland OH, December 15.

**Burke DJ**, and Carrino-Kyker SR (2016). Land use history effects on forest ecological integrity: How do plant and soil fungal communities respond? Kent State University Water and Land Symposium, October 6 (poster).

**Burke DJ**, Carrino-Kyker SR, and Kalisz S (2016) Deer and invasive plant removal can change soil fungal communities and soil chemistry: evidence from a long-term field experiment. Ohio Invasive Plants Council Research Conference, Columbus OH, February 11. (Poster)

Lance A, Hausman C, **Burke D**, and Burns J (2015) Manipulation of soil microbial communities in the restoration of Acacia Reservation. 7<sup>th</sup> Annual Cleveland Metroparks Natural Resources Research Meeting, December 11. (Poster)

Krynak KL, **Burke DJ**, and Benard MF (2015) Landscape and water characteristics correlate with immune defense trait differences across Blanchard's Cricket frog (*Acris blanchardi*). Early Career Scientist Symposium, University of Michigan, March 28.

Krynak KL, **Burke DJ**, and Benard MF (2015) What can an assessment of immune defense traits across a landscape tell us about Cricket frog health? Ohio Natural History Conference, Columbus, OH, February 28. (Poster)

Krynak K, Benard MF, and **Burke DJ** (2013) Do small changes in larval habitat pH alter immune defense traits in Bullfrogs (*Rana catesbeiana*)? 21<sup>st</sup> Nonpoint Source Monitoring Conference and Workshop, American Society of Civil Engineers, Cleveland, OH, October 28-30.

**Burke DJ** (2013) "Mushroom, trees and microbes: How do our forests respond to decades of acid rain?" Scientist Lecture Series, The Holden Arboretum, January 17.

Krynak K, Benard M, and **Burke D** (2012) Does larval habitat pH influence *Rana catesbeiana* immune defenses post-metamorphosis? Midwest Partners in Amphibian and Reptile Conservation Annual Meeting, Pioneer OH, September 7-9.

**Burke DJ** (2009) More than just trees: The unseen components of forest ecosystems. Scientist Lecture Series, The Holden Arboretum, December 9.

- Burke DJ** (2009) Mycorrhizas in the middle: plant/soil effects of mycorrhizas in a forest ecosystem. Conservation Symposium Series, Cleveland Museum of Natural History, September 11.
- Burke DJ**, Chan CR and Smemo KA (2007) The influence of soil environment on the diversity of ectomycorrhizal fungi in a mature beech-maple forest. Thirty-fourth annual Natural Areas Conference, Cleveland, Ohio, October 9-12.
- Burke DJ**, Smemo KA and Mahaney W (2007) Invasive species research at the Holden Arboretum. Ohio invasive plants research conference: continuing partnerships for invasive plant management, Ohio Wesleyan University, January 18 (Poster).
- Burke DJ**, Martin KJ, Rygiewicz PT and Topa MA (2003) Ectomycorrhizal community composition on loblolly pine ecotypes as determined by terminal fragment length comparisons. Mini-Symposium on Root-Soil Interactions, Center for Root-Soil Research, Cornell University, Ithaca, New York, April 24.
- Burke DJ** and Hahn D (1999) Nitrogen nutrition of marsh grasses. Polgar Fellowship Studies Presentation of Findings, Institute of Ecosystems Studies, Millbrook, New York, August 31.
- Burke DJ**, Weis JS and Weis P (1999) Excretion of metals by the salt marsh grasses *Spartina alterniflora* and *Phragmites australis*. Thirty-Second Middle Atlantic Regional Meeting of the American Chemical Society, Fairleigh Dickinson University, Madison, New Jersey, May 17-19.

#### **Presentations - Undergraduate Research Presentations**

- Chervenak CF, Carrino-Kyker SR, Hewins CR, and Burke DJ (2016) Root mat fungal communities and extracellular enzyme activities respond to changes in pH and phosphorus addition. 1<sup>st</sup> Annual SEARCH Symposium, Holden Arboretum, Cleveland OH, August 3.
- Mann M, **Burke DJ**, Burns JH, Valverde OJ, and Medeiros JS (2016) Relating leaf and root morphology to microbial community composition in *Rhododendron*. 1<sup>st</sup> Annual SEARCH Symposium, Holden Arboretum, Cleveland OH, August 3.
- Parker AL, Hoke A, Carrino-Kyker SR, Krebs SL, and **Burke DJ** (2016) Effect of the soil microbiome on disease resistance in American Beech (*Fagus grandifolia*) and Red Oak (*Quercus rubra*). 1<sup>st</sup> Annual SEARCH Symposium, Holden Arboretum, Cleveland OH, August 3.
- Rapini AT, Carrino-Kyker SR, and **Burke DJ** (2016) The impact of land-use history on soil fungal communities in a northern hardwood forest. 1<sup>st</sup> Annual SEARCH Symposium, Holden Arboretum, Cleveland OH, August 3.
- Wagner A, Krynak K, Dennis P, and **Burke D** (2015) Does sex, age, or species drive gut microbial community similarities between captive lorikeets? 7<sup>th</sup> Annual Cleveland Metroparks Natural Resources Research Meeting, December 11.
- Wagner A, Krynak K, Dennis P, and Burke D (2015) Does sex, age, or species drive gut microbial community similarities between captive lorikeets? Kent State University's

Undergraduate Symposium on Research, Scholarship, and Creative Activity, March 11.  
\*Second place finish in biology category.

Wagner A, Krynak K, Benard M, and Burke D (2014) How rapidly can Bd (*Batrachochytrium dendrobatidis*) adapt to antimicrobial peptide defenses of American Bullfrogs? Holden Summer Intern Research Presentations, The Holden Arboretum, July 29.

Klenkar MK, and Burke DJ (2014) Effects of mycorrhizal fungi, water reduction, and neighboring plant species on seedling growth performance of *Arisaema triphyllum* and *Maianthemum racemosum*. Holden Summer Intern Research Presentations, The Holden Arboretum, July 29.

Wagner A, Krynak K, Dennis P, and Burke D (2014) Does sex, age, or species drive gut microbial community similarities between captive lorikeets? Presentation to Conservation and Science Department, Cleveland Metroparks Zoo, July 24.

Flanigan A, MacBeth M, Zhao X, **Burke D**, and Burns J (2013) Do closely related plants create similar soil microbial communities in the rhizosphere. Case Western Reserve University, Intersections Undergraduate Presentations, August 2.

Amick J and **Burke D** (2010) Precipitation, pathogens and place: Microbial contaminants in the rooftop rainwater of urban and rural buildings. Case Western Reserve University, Intersections Undergraduate Presentations, April 16.

Zajac A, Carrino-Kyker S, **Burke D**, and Bernard M (2009) Genetic Diversity and Top Down Controls on Zooplankton and Microbial Communities. Summer Program in Undergraduate Education (SPUR), Case Western Reserve University, July 31.

### **Invited Seminars**

The Wilds, Conservation and Restoration Ecology Department (July 2016)

John Carroll University, Department of Biology (October 2014)

Case Western Reserve University, Department of Biology (October 2014)

Cleveland State University, BGES Department (March 2012)

Kent State University, Department of Biological Sciences (September 2011)

Bowling Green State University, Department of Biological Sciences (March 2011)

John Carroll University, Department of Biology (March 2010)

University of Pittsburgh, Department of Biological Sciences (October 2008)

Ohio University, Department of Environmental and Plant Biology (October 2008)

Cleveland State University, BGES Department (April 2008)

East Stroudsburg University, Department of Biology (September 2007)

John Carroll University, Department of Biology (May 2007)

Case Western Reserve University, Department of Biology (January 2006)

Smithsonian Research Institute, Edgewood Maryland (January 2006)

State University of New York, Department of Environmental and Forest Biology (December 2004)

USDA, Appalachian Farming Systems Research Center (October 2004)

University of Vermont, Burlington, College of Agriculture and Life Sciences (November 2003)  
University of West Florida, Department of Biological Sciences (February 2003)  
Boyce Thompson Institute for Plant Research at Cornell University (August 2002)  
Mary Washington College, Department of Biological Sciences (February 2002)  
Hofstra University, Department of Biological Sciences (February 2002)  
Rutgers University, Department of Biological Sciences (1998, 1999, 2000, 2001)

### **Teaching Experience - Lecturer**

**Field Ecology** (Fall 2001): Presented four classes on vegetation types encountered in New Jersey and environmental factors influencing vegetation across the state.

**Plant Ecology** (Spring 1997): Responsible for developing plant ecology course for undergraduate biology majors. Incorporated topics in plant geography, autecology and synecology to examine the relationships between plants and their environment.

### **Teaching Experience - Teaching Assistantships**

**Plant Physiology Laboratory** (Fall 1999, Fall 2000): Responsible for instruction of plant physiology laboratory for undergraduate biology majors, including assessment and grading of laboratory reports.

**General Biology** (Spring 1999): Instructor for both laboratory and discussion sections of introductory biology course

**Field Ecology** (Spring 1998): Aided students in field identification of plant species common to forests, fields, and shorelines of New Jersey

**Biology of Seed Plants Laboratory** (Fall 1997, Fall 1998): Responsible for supervision and instruction of basic plant biology class for undergraduate biology majors, including coordination of laboratory technicians and junior teaching assistants for preparation of class materials

### **Teaching Experience - Mentoring**

#### ***Postgraduate Scholars:***

Katherine Krynak (2015-2016) Case Western Reserve University/The Metroparks Zoo

Nicole Pietrasiak (2015) The Holden Arboretum

Sheryl Peterson (2012-2014) Case Western Reserve University/The Holden Arboretum

Sarah Carrino-Kyker (2010-2014) Case Western Reserve University

Laurel Kluber (2010-2012) Case Western Reserve University

Juan Carlos López-Gutiérrez (2007-2009) Case Western Reserve University

#### ***Thesis Advisor:***

Andrew Lance, Doctoral committee member, (2016-present) Case Western Reserve University

Jennifer Murphy, Doctoral committee member, (2015-present) Case Western Reserve University

Anna Osvaldsson, Doctoral committee member, (2015-present) Case Western Reserve University

Colin Cope, Doctoral committee member, (2013-present) Case Western Reserve University

Nivedita Clark, Doctoral committee member, (2011-present) Kent State University  
Jennifer Piechowski, Master's committee member, (2015) Case Western Reserve University  
Nasmah Bastaki, Doctoral committee member, (2012-2015) Case Western Reserve University  
Katherine Krynak, Doctoral committee member, (2011-2015) Case Western Reserve University  
Sheryl Peterson, Doctoral committee member, (2008-2011) Case Western Reserve University  
Cory Bickel, Doctoral committee member, (2008-2011) Case Western Reserve University  
Sarah Carrino-Kyker, **Doctoral advisor**, (2007-2010) Case Western Reserve University  
Sandra Albro, Master's committee member, (2007-2009) Case Western Reserve University  
Gunjan Andlay, Master's committee member, (2009-2010) Case Western Reserve University

***Undergraduate Students:***

Catherine Chervenak (2016) Case Western Reserve University  
Anna Parker (2016) University of Rochester  
Alicia Rapini (2016) Kent State University  
Emily Titus (2015) Michigan State University  
Mary Kay Klenkar (2014, 2015) Ohio State University  
Alexa Wagner (2014) Kent State University  
Alexandra Flanigan (2013) Baldwin Wallace University  
Morgan MacBeth (2013) Case Western Reserve University  
Xiaoni Zhao (2013) Case Western Reserve University  
Amanda Shalkhauser (2013) Baldwin Wallace University  
Kaitlin Coyle (2011, 2012) Case Western Reserve University  
Rose Egelhoff (2011) Pomona College  
Hannah Wilson (2011) Allegheny College  
Joseph Amick (2010) Case Western Reserve University  
Andrew Zajac (2009) Case Western Reserve University  
Diane Moon (2009) Case Western Reserve University  
Ryan Miller (2009) Case Western Reserve University  
Chairut Vareechon (2008) Case Western Reserve University  
Nathaniel Hubert (2004) Boyce Thompson Institute  
Ann Danko (2004) Boyce Thompson Institute  
Alberto Stolfi (2003) Boyce Thompson Institute  
Todd Lester (2003) Boyce Thompson Institute

## **Professional Affiliations**

Ecological Society of America  
Botanical Society of America  
American Society of Microbiologists

## **Professional Activities and Service - Reviewer and Referee**

### ***National Science Foundation***

Ad hoc reviewer, Integrative Organismal Systems, Directorate for Biological Sciences (2013)  
Panelist, Population and Community Ecology Cluster, Division of Environmental Biology (2010)  
Ad hoc reviewer, Ecosystem Science Cluster, Division of Environmental Biology (2009, 2010)  
Ad hoc reviewer, Population and Community Ecology Cluster, Division of Environmental Biology (2009, 2010)

### ***NASA/DOE/USDA***

Panelist, NASA carbon cycle science joint panel. Served on “Belowground carbon processes and soil carbon” theme area (USDA/DOE) (2013)

### ***Army Corps of Engineers***

Ad hoc reviewer, Engineer Research and Development Center - ERDC (2008-2010, 2013)

### ***Journal Reviewer***

I generally review at least one manuscript per month for journals such as: *Applied and Environmental Microbiology*, *Biological Invasions*, *Botany*, *Microbial Ecology*, *New Phytologist*, *Plant Ecology*, *Plant and Soil*, *Science*, and *Soil Biology and Biochemistry*.

## **University Service – Case Western Reserve University**

Search committee member, community ecology (2013)  
Search committee member, plant ecology (2010)  
Search committee member, plant ecology (2009)  
Qualifying exam committee member (2008; 2013; 2015)

## **Service – The Holden Arboretum**

Appointed Research Chair, responsible for administration and oversight of research department activities (April 2012-present)  
Conserving native forests committee lead staff member (2014-present)  
Research advisory committee lead staff member (2013-present)  
Chair of Kent-Holden affiliation steering committee (2013-present)  
Search committee chair, plant biologist search (2015)

Search committee chair, plant biologist search (2012)

Natural areas research and management plan committee staff member (2009-2012)

Editorial board for “Leaves”, the quarterly publication of the Holden Arboretum (2008-present)

Strategic direction planning, regional and conserving forests committee (2009-present)

Served on search committees for Holden postdoctoral fellows (2007, 2008)

Website review committee (2008)

### **Other Service**

Organized SEARCH symposium for undergraduate students conducting summer research in northeast Ohio 2016.

Organizer, Holden Scientist Lecture Series 2012-2016.

Co-organizer, Holden Scientist Lecture Series 2011-2012.

Judge for student presentations, ecological section, Botany 2013.

Founding member of the Ohio soil ecology co-laboratory (OSEC) (2006)

Co-organizer, Soil ecology forum, Holden Arboretum (2006)

Participant rhizosphere/mycorrhizal discussion group Boyce Thompson Institute, Cornell University and SUNY-ESF (2002-2004)

Biological Sciences Colloquium organizer, Rutgers University (1999)

### **Outreach - K-12 Teachers**

I offered instruction in soil ecology to high school science teachers through Holden’s Mastin Summer Science Institute, a continuing education program.

1. Instructed teachers in soil ecology lessons for the Scholars Institute continuing education program through the education department. Instructed middle and high school teachers on soil ecology lessons they can use in their classrooms (2012).
2. Taught section on soil seed banks and methods of plant reproduction, and use of seed banks to demonstrate plant diversity and succession (2011).
3. Taught afternoon sessions in soil ecology for “Soil: Inside and out”, a week long course in soil ecology. Participating teachers from grades 5-12. (2009)
4. Prepared lesson plan on mycorrhizal fungi and instructed teachers on mycorrhizal ecology and how mycorrhizas can be examined in the classroom (2007)

### **Outreach - K-12 Students**

I have conducted workshops in soil ecology at Holden for middle and high school biology classes (2008-2017).

1. Led 7<sup>th</sup> grade students from the Painesville school system through exercises on soil ecology (2011-2017). Expanded to include Chardon and Mentor school system in 2016-17.



2. Led field exercises examining fungal diversity for middle school students at Hershey-Montessori Farm School (2010-2015).
3. 9<sup>th</sup> grade biology class from Hershey-Montessori Farm School. Students learned about soil fungi, DNA extraction and fingerprinting techniques (2010-2016).
4. Participated in Kent State's upward bound program that provides educational experiences for inner city high school students from Canton. 35 students visited Holden and took part in exercises about plant and forest ecology with the research department. I led the exercise on mycorrhizal fungi (2013).
5. Advanced placement biology class from West Geauga High School. Mushroom survey, morphotyping and DNA extraction demonstration (2008, 2012).
6. Science mentor for Beaumont School, Cleveland Heights (2009).

### **Outreach - General Public**

#### ***Garden Clubs***

I have given public talks to diverse audiences outside of the Holden Arboretum (2008-2016). Examples are listed below.

Spoke to Cuyahoga County Master Gardeners about healthy soil and food webs (2016).

Presented talk for the 3rd Annual Green Conference organized by The Association of Professional Landscape Designers Ohio Chapter and The Holden Arboretum. Talk was entitled "Healthy Soil – Healthy Food Webs: Going beyond composting to understand the life beneath our feet (2016).

Presented public talk for "Suds and Science" program at the Chardon Brew Works. Talk was entitled "Mushroom, trees and microbes: How do our forests respond to decades of acid rain? (2012).

Spoke to Shaker Lakes Garden Club about mycorrhizas and hardwood forests (2010).

Spoke to Cuyahoga County Master Gardeners about mycorrhizal fungi and garden plants (2008).

#### ***Fridays in the Garden***

A regular series sponsored by the Holden Arboretum for visitors, members and the public focusing on cultivated and native plants. I have given talks on invasive plant species, rhizosphere biology research at Holden, and acid deposition and hardwood forests.

#### ***Leaves***

The quarterly publication of the Holden Arboretum reaches over 8000 members. I have written several articles on ecology for *Leaves* over the last few years. Articles covered topics such as mycorrhizal fungi, plants and climate change, mycorrhizal diversity at Holden, vernal pool ecology, winter ecology, and a matching activity piece on fungal diversity for children. I have also organized the research profile section of *Leaves* each month for the last 4 years, including news and highlights sections.