

Brendan O'Neill
Research Scientist
School for Environment and Sustainability
University of Michigan
4032 Dana Building, 440 Church St., Ann Arbor, MI 48109
(734) 647-5047; obrendan@umich.edu

POSITIONS

Research Scientist – School for Environment and Sustainability, University of Michigan, December 2019-present

Instructor – Agricultural Ecology CSS442. Department of Plant, Soil and Microbial Science, Michigan State University, (MSU), September 2019-December 2019.

Instructor - General Ecology, EEB381 – University of Michigan Biological Station (UMBS), Summer 2018.

Postdoctoral researcher and visiting Scholar- W. K. Kellogg Biological Station, Great Lakes Bioenergy Research Center at MSU, September 2017 – June 2018

EDUCATION

Michigan State University, Department of Plant, Soil and Microbial Sciences – *Ph.D.* (Spring 2017).

Cornell University *M.Sc. Crop and Soil Science* (Spring 2007). Specialization in soil microbiology.

Indiana University *B.S. Biology* (Spring 2000) / *B.A. Spanish* (Spring 2001) (*In the Honors College*)

RELEVANT EMPLOYMENT

Cornell University, Department of Crop and Soil Science – *Researcher and Lab Manager* (Summer 2008- 10). Conducted basic research into biochar systems with Dr. Johannes Lehmann. At the Cornell Soil Health Laboratory, carried out and oversaw soil health assays for hundreds of research and farm field soil health tests, formalized and consolidated standard operating procedures for assays across multiple labs and departments with Dr. Harold van Es.

Kabul University, Department of Natural Resources and Agriculture - Kabul, Afghanistan. (Summer, 2007). Updated and revised departmental curricula for a USAID funded initiative. Assessed classroom instruction, research laboratories and demonstration field sites. [Trained faculty](#) in soil and water analysis, electronic research methods, and proposal writing to link with local NGOs. Implemented analytical protocols for forestry, agronomy and microbiology laboratories.

Centro de Energia Nuclear na Agricultura (CENA) - Visiting Researcher. Piracicaba, Brazil. (Fall, 2006). Collaborated on research with Dr. S.M Tsai, identifying microorganisms associated with biochar in anthropogenic Amazonian soils. Collected and processed soil and biochar samples from remote Amazonian field sites. Optimized molecular methods including T-RFLP and DGGE. Developed joint grant proposals and Memorandum of Understanding between Cornell University and CENA. Invited as a guest lecturer by faculty members at CENA and the Universidade de São Paulo, Escola Superior de Agricultura 'Luiz de Queiroz' (in Portuguese).

University of Kentucky Department of Plant Pathology - Independent Researcher (winter-summer 2003)
Collaborated on research mapping and isolating virulence genes from clone library of pathogen strains of (*M. grisea*) which causes rice blast with Dr. Mark Farman.

Alltech Solid State Fermentation – *Laboratory Director*, Serdan, Mexico. (2000 - 2002) Directed the work of three microbiologists, two chemists and two laboratory technicians. Monitored, compiled and presented data on enzyme activity, moisture, water and air quality in an enzyme production facility. Designed a strain maintenance and selection regime for fungal species used in the solid state fermentation process. Developed and adapted standard operating procedures for the lab as well as areas of the production plant. Provided courses in lab and plant safety. Taught biweekly English classes. Evaluated and procured new laboratory equipment. Formulated monthly budget and tracked expenditures.

Indiana University Department of Biology – *Laboratory Assistant in Laboratory of Dr. Keith Clay* (05/98 – 06/00) Collected and compiled data in a lab and field setting on effect of fungal endophytes on plant community structure. Performed experimental plot sampling, extensive plant identification, and identification of infection status using microscope. Conducted multiple experiments in community ecology, including influence of trophic-level interactions, parasitism/mutualism and spatial distribution on community structure.

Unbound educational foundation – *Volunteer*. Huehuetenango, Guatemala. (09/95-08/96) Lived in rural, indigenous communities. Worked in reforestation, small-holder agriculture and fuel-efficient stove projects. Translated correspondence. Taught English. Accompanied refugee communities.

AWARDS AND FUNDING

GK-12 Bioenergy Sustainability Project Fellowship (NSF) – (2014-15). \$35,000

USDA-SARE Graduate Student Research Grant (2014) \$6,853

Kellogg Biological Station Summer Research Fellowship – (2014). \$6,750

Kellogg Biological Station Summer Research Fellowship – (2012). \$1,500

C.S. Mott Pre-doctoral Fellowship in Sustainable Agriculture – (2010-13). \$35,000

PUBLICATIONS

O'Neill, B. Grandy, A.S., Robertson, G.P., Kravchenko, A., Schmidt, T.M. Crop Rotational Complexity Shifts microbial processing and storage of soil organic carbon. *In preparation for Global Change Biology*.

O'Neill, B. Gross, K., A.S., Robertson, G.P. Potentially mineralizable soil nitrogen and leaf chlorophyll in maize growth with different rotational histories. *In preparation for Applied Soil Ecology*.

O'Neill, B. Grandy, A.S., Robertson, G.P., Kravchenko, A., Schmidt, T.M. Cover crops change soil bacterial composition but not diversity. *In preparation for Ecological Applications*.

O'Neill, B. Sprunger, C.D., Kerr, J., Kravchenko, A., Robertson, G.P. Aligning soil health testing and farmer knowledge for improved on-farm soil management. *In preparation for Journal of Environmental Quality*.

2018 **O'Neill, B.** Grandy, A.S., Robertson, G.P., Kravchenko, A. H. Juottonen, H., T.M. Schmidt, T.M. Legume cover crops alter microbial controls on soil denitrification rates and efficiency. *In preparation for Soil Biology and Biochemistry*.

2018 Teal, T.K., Vicente Gomez-Alvarez, V., **O'Neill, B.**, Thomas M. Schmidt, T.M. Increased Capacity for N₂O Production in Microbial Communities Under Agricultural Management. *In preparation for Environmental Microbiology*.

2010 Grossman, J.M.; **O'Neill, B.**; Tsai, S.M. Thies, J.E., PCR-DGGE analysis identifies novel Archaea and Eubacteria in anthropogenic Terra Preta soils of the Brazilian Amazon. *Microbial Ecology*, 60:192-205.

2010 Biqing L., Lehmann J., Sohi S., Thies, J.E., **O'Neill, B.**, Trujillo, L., Gaunt, J., Solomon, D., Grossman, J., Neves, E. G., Luizão, F.J. Black Carbon Affects the Cycling Of Non-Black Carbon in Soil. *Organic Geochemistry*, 41 (2010) 206-213.

2009 **O'Neill, B.**, Grossman, J., Tsai, S.M., Gomes, J.E., Lehmann, J., Peterson, J., Neves, E., Thies, J.E. microbial Community Composition in Brazilian Anthrosols and Adjacent Soils Using Culturing and Molecular Identification. *Microbial Ecology*, 58: 23-35.

2009 Tsai, S.M., **O'Neill, B.**, Cannavan, F.S., Saito, D., Falcão, N.P.S., Kern, D. Grossman, J., Thies, J. The Microbial World of *Terra Preta*. *In Amazonian Dark Earth: Wim Sombroek's Vision*, edited by Woods, W.I., Teixeira, W.G., Lehmann, J., Steiner, C., WinklerPrins, A., Rebellato, L. Springer, Berlin.

2007 Vadas, T.M.; Fahey, T.J.; Sherman R.E.; Demers, J.D.; Grossman, J.M.; Maul, J.E.; Melvin, A.M.; **O'Neill, B.**; Raciti, S.M.; Rochon, E.T.; Sugar, D.J.; Tonitto, C.; Turner, C.B.; Walsh, M.J.; Zue, K. Approaches for analyzing local carbon mitigation strategies: Tompkins County, New York, USA, *International Journal of Greenhouse Gas Control*, 1 (3): 360-373.

2006 Liang B., Lehmann, J., Solomon, D. Kingyangi, J., Grossman, J.M. **O'Neill, B.**, Skjemstad, J.O., Thies J., Luizão, F.J., Petersen, J. Neves, E.G.. Black Carbon Increases Cation Exchange Capacity in Soils. *Soil Science Society of America Journal*. 70 (5): 1719-1730.

TEACHING EXPERIENCE

Instructor, Agricultural Ecology. Department of Plant, Soil and Microbial Science, Michigan State University (fall 2018 and fall 2019)

Instructor in General Ecology – [University of Michigan Biological Station](#). Intensive (5-credit) field-based course in Ecology (summer 2018)

STEM Teaching Fellowship - [Kellogg Biological Station's GK-12 BioEnergy SusTainability](#) (BEST) Project Fellow in NSF-funded year-long teaching initiative. Weekly instruction of Michigan high school and middle school students ranging from lectures and laboratory exercises to semester-long, research projects. Maintained long-term ecological experiments on school grounds in coordination with other schools/districts. (2014-2015).

Guest Lecturer

- Foundations of Sustainable Food Systems, University of Michigan – EAS 528 (fall 2019)
- Agroecosystem Management: Nutrient Cycles and Soil Fertility, University of Michigan – EAS 524 (winter 2016, 2017, and 2019)
- Introduction to Sustainable Agriculture and Food Systems - MSU CSS124 (fall 2012 and 2013)
- International Agroecology, IPM, and Sustainable Agriculture Short Course Program MSU (summer 2011)
- Soil Biology MSU CSS360 (fall, 2010)

Instructor in Agricultural Science and Microbiology Courses

- August, 2006. Co-instructor (in Portuguese) for short course *Methods in Soil Microbial Ecology*. Funded by a competitive grant from the American Society for Microbiology (ASM) and hosted by the National Institute for Amazonian Research (INPA) and the Federal University of Amazonas (UFAM), Manaus, Brazil.
- August, 2005. Co-instructor (in Portuguese) for Introduction to Soil Microbiology. Funded by the National Science Foundation (NSF) for select Brazilian graduate students and faculty, INPA, and the Center of Biotechnology in Amazonas (CBA), Manaus, Brazil.

Mentor to Undergraduate Researchers

- Summer, 2014. Mentored REU research project at the KBS-LTER research plots, and implementing soil health testing on Michigan farms.
- Fall, 2005-Spring, 2007. Worked with Cornell honors undergraduate to evaluate fungal communities in Amazonian anthropogenic soils. Isolated and enumerated mycorrhizal spores, identified saprophytic fungi prevalent in soils and used T-RFLP for community-level analysis. Guided student in preparing results for presentation at an international conference.
- Spring, 2004. Worked with an undergraduate student to develop and optimize primers for *real-time* PCR analysis of *NifH* and *AmoA* genes in field sites with *Bt* and non-*Bt* maize.

Undergraduate Teaching Instructor - Indiana University Courses

- [Freshman Intensive Seminar: English and Spanish Literature](#) (summer 1998 and 1999). Designed course about the interaction of English and Spanish language through culture together with Honors College professor. Lectured, led discussion, designed and critiqued assignments. Mentored incoming students.
- [Introduction to Environmental Science](#) (spring 1999) Led discussion sections, held office hours, designed assignments e.g. calculation and comparison of types of energy consumption: metabolic, solar, fossil fuel.

- Introduction to Public Affairs (fall 1997) Led discussion sections. Met regularly with professor and graduate students to discuss course progress. Held office hours.

SCHOLARLY ORAL PRESENTATIONS:

- 2017 **O'Neill, B.**, Sprunger, C., Kerr, J.M., Robertson, G.P. Aligning soil health testing and farmer knowledge for improved on-farm soil management (5 minute IGNITE talk). Soil Ecology Society. Fort Collins, Colorado.
- 2017 **O'Neill, B.**, Schmidt, T., Robertson, G.P., Kravchenko, S. Grandy, A.S. Linking soil C and N cycling and trace gas fluxes with soil bacterial communities along a gradient of simple to complex crop rotations. Soil Ecology Society. Fort Collins, Colorado.
- 2016 **O'Neill, B.**, Schmidt, T., Robertson, G.P., Grandy, A.S. Increased cropping system diversity reshapes microbial communities and restructures soil nutrient cycling pathways. ASA, CSSA, & SSSA Annual Meetings, Phoenix, AZ
- 2007 Grossman, J. M., **O'Neill, B.**, McPhillips, L.E., Tsai, S.M. Lehmann, Thies. J.E., Microbial ecology of anthrosols: Assessing soil community diversity of bacteria, archaea, and fungi in Amazonian dark earths of Brazil. Ecological Society of America Joint Meeting. San Jose, CA
- 2007 **O'Neill, B.**, Grossman, J., Tsai, S.M., Lehmann, J., Thies, J.E. Analysis of bacterial communities in Amazonian Dark Earths through community-level molecular analysis and identifying dominant species in soils from the Eastern and Central Amazon. International Agrichar Initiative. New South Wales, Australia. May.
- 2006 **O'Neill, B.** Terra Preta to Bio-char: Strengthening the Links Between Model System and Practical Application. CIIFAD seminar series. November.
- 2005 **O'Neill, B.** Unlocking Microbial Community Diversity in Brazilian *Terra Preta* Soil and Adjacent Oxisols. Department of Crop and Soil Science Seminar Series. April.
- 2004 Clune, D. Horner, A., Moebius, B., **O'Neill, B.** Biointensive Minifarming: Updates from a recent workshop and open discussion on sustainable agriculture. CIIFAD seminar series. September
- 2004 **O'Neill, B.**; Grossman, J.; Thies, J. Unlocking microbial communities in Terra Preta: nucleic acid extraction and purification as keys to characterizing biology in black carbon soils. Energy and Agricultural Carbon Utilization Symposium, Athens, Georgia, June.

SCHOLARLY POSTER PRESENTATIONS:

- 2015 **O'Neill, B.**, Juottonen, H., Tracy Teal, T., Schmidt, T.M. Assessing Pathways to Potential N₂O Emissions in Different Land Use Systems Using Targeted Pyrotag, Whole Metagenome and Soil Assay Approaches. Kellogg Biological Station - All Scientist Meeting. 2015
- 2015 Cave, J. **O'Neill, B.**, Sprunger, C., Kerr, J., Assessing Soil Health on Michigan Grain Farms. Kellogg Biological Station- All Scientist Meeting. 2015
- 2015 Dittmar, E., Fegan, D. **O'Neill, B.** Bodbyl Roels, S. Kellogg Biological Station's GK-12 BioEnergy Sustainability Project (BEST):Bringing Fellow Expertise to Classrooms and Engaging Fellows, Teachers, and K-12 Students in Sustainable Inquiry Activities. Kellogg Biological Station- All Scientist Meeting. 2015
- 2012 **O'Neill, B.**, Teal, T.K., Grandy, A.S., Schmidt, T.M. Cover Crops Have the Greatest Impact on Soil Ecosystem Function Along a Gradient of Cropping System Diversity ASA, CSSA, & SSSA Annual Meetings. Cincinnati, OH

- 2007 McPhillips, L. **O'Neill, B.**, Tsai, S.M., Grossman, J., Lehmann, J., Thies, J.E. Soil fungal communities in three ADE sites characterized by molecular fingerprinting, isolating unique species and assessing arbuscular mycorrhizal fungi. International Agrichar Initiative. New South Wales, Australia, May.
- 2007 Tsai, S.M., **O'Neill, B.**, Campos, D., Gomes, J.E., Grossmann, J., Thies, J.E. Biodiversity in Amazonian Dark Earth: A contribution for the sustainability of tropical soils from the microbial symbioses. 15th International Congress on Nitrogen fixation and 12th international conference of the African Association for Biological Nitrogen Fixation Cape Town, South Africa. January.
- 2006 **O'Neill, B.**, Grossman, J., Tsai S.M., Gomes, J.E., Garcia, C.E. Solomon, D., Liang, B., Lehmann, J. Thies, J. Isolating Unique Bacteria from Terra Preta Systems: Using Culturing and Molecular Techniques as Tools for Characterizing Microbial Life in Amazonian Dark Earths. World Congress of Soil Science. Philadelphia, Pennsylvania. July.
- 2006 Grossman, J.M.; **O'Neill, B.**; Gomes J. E; Tsai, S.M.; Lehmann, J.; Liang, B. Thies, J.E. Soil microbial communities associated with Anthropogenic Dark Earths (Terra Preta) and black carbon particles. World Congress of Soil Science, Philadelphia, Pennsylvania. July.
- 2004 **O'Neill, B.**; Grossman, J.; Thies, J. Exploring microbial community diversity in Brazilian Terra Preta soils: comparative analysis of high carbon anthropogenic soils and oxisols, International Society for Microbial Ecology, Cancun, Mexico, August 22-27.

FOREIGN LANGUAGES

Spanish (fluent), Portuguese (highly proficient)

Last revised: January 30, 2020