**C. Ryan Penton**

Assistant Professor

College of Integrative Sciences and Arts

Arizona State University, Polytechnic Campus

6073 S. Backus Mall, Wanner Hall Rm 340E

Office: 480-727-5738

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**Operational Definition of the Field**: Microbial Ecology is focused on microorganisms, their relationship with one another, and with the environment.

**Home Unit Description:** College of Integrative Sciences and Arts, Faculty of Science and Mathematics, Polytechnic campus. Teaching load is two courses per semester.

**EDUCATION**

**Ph.D.**,*Michigan State University* **2008**

Emphasis: Microbial Ecology

Dissertation title: *Microbial N cycling in marine and freshwater sediments: The distribution,*

*abundance, and activity of anaerobic ammonium oxidizing (Anammox)*

*bacteria and microbial community analysis of marine sediments.*

**M.Sc.**, *University of Florida* **2004**

Emphasis: Wetland Biogeochemistry

Thesis title: *Influences of nutrient loading, vegetative habitats, and simulated drought*

*on microbial enzyme activities in the Florida Everglades.*

**B.Sc.**,*University of Florida* **1998**

Major: Microbiology

Minor: Chemistry

**APPOINTMENTS**

**F2019-current Associate Professor**

College of Integrative Sciences and Arts, ASU Polytechnic Campus

Sustainability Scientist, Julie Ann Wrigley Global Institute of Sustainability

**F2014-2019 Assistant Professor**

College of Integrative Sciences and Arts, ASU Polytechnic Campus

Honors Faculty, Barrett, The Honor’s College

Sustainability Scientist, Julie Ann Wrigley Global Institute of Sustainability

**2016-current Affiliated Faculty**

ASU Center for Fundamental and Applied Microbiomics, Biodesign

Institute, ASU

**2009-2014 Post-doctoral Researcher and Instructor**

Center for Microbial Ecology, Michigan State University

**2004-2008 Graduate Assistant**

Center for Microbial Ecology, Michigan State University

**2003-2004 Graduate Assistant**

Soil and Water Science Department, University of Florida

**1999-2003 Senior Scientific Associate**

Everglades Research Division, South Florida Water Management District

**1998-1999 High School Chemistry Teacher**

Royal Palm Beach High School, West Palm Beach, FL

* 1. **Research Assistant**

Department of Molecular Neurobiology, Shands Hospital, University of Florida

**PUBLICATIONS**

**Google Scholar: 1034 citations as of May, 2019**

**h-index: 16**

**i10 index: 21**

**PUBLISHED MANUSCRIPTS – PEER-REVIEWED**

**33.** Qiao C., Li R., **Penton C.R.**, Liu C., Shen Z., Ou Y., Liu Z., Xu X., Rong L., Shen Q. 2019. Key extracellular enzymes triggered high-efficiency composting associated with bacterial community succession. Bioresource Technology (accepted)

**32.** Hale, L., Feng W., Yin H., Guo X., Zhou X., Bracho R., Pegoraro E., **Penton C.R.**, Wu L., Cole J., Konstantinidis K.T., Luo Y., Tiedje J.M., Schuur E.A.G., Zhou J. 2019. Tundra microbial community taxa and traits predict decomposition parameters of stable, old soil organic carbon. International Society of Microbial Ecology Journal (ISMEJ). ISMEJ-18-01242AR1.

**31.** Qiao C., **Penton C.R.**, Zhang R., Wang S., Xong W., Liu C., Wang R., Liu W., Yu J., Shen Q. 2019. Reshaping the rhizosphere microbiome by bio-organic amendment to enhance crop yield in a maize-cabbage rotation system. Applied Soil Ecology. DOI:10.1016/j.apsoil.2019.04.014

**30.** Yu J., Deem L.M., Crow S.E., Deenik J.L., **Penton C.R.** 2019. Comparative Metagenomics Reveals Enhanced Nutrient Cycling Potential After Two Years of Biochar Amendment in a Tropical Oxisol. Applied and Environmental Microbiology**.** DOI:10.1128/AEM.02957-18

**29.** Feng J., **PentonC.R.,** HeZ., Van NostrandJ.D., YuanM.M., WuL., QinY, ShiZ.J., GuoX., SchuurE.A.G., LuoY., BrachoR., KonstantinidisK.T., TiedjeJ.M., ColeJ.R., YangY., Zhou J. 2019. Long-term winter warming in Alaska enlarges the diazotrophic community in deep soils. mBIO 10(1) e02521-18. DOI: 10.1128/mBio.02521-18.

**28.** Shen Z., Xue C., **Penton C.R.**, Thomashow L.S., Zhang N., Wang B., Ruan Y., Li R., Shen Q. 2019. Suppression of banana Panama disease induced by soil microbiome reconstruction through an integrated agricultural strategy. Soil Biology and Biochemistry 128:164-174. DOI:10.1016/j.soilbio.2018.10.016

**27.** Xue C., **Penton C.R.**, Zhang C., Wang Q., Zhao M., Zhang B., Chandler J.E., Shen Q, Tiedje J.M. 2019. Effect of LSU and ITS genetic markers and reference databases on analyses of fungal communities. Biology and Fertility of Soils 1-10. DOI:10.1007/S00374-018-1331-4.

**26.** Liang J., Zhou Z., Huo C., Shi Z., Cole J.R., Huang L., Konstantinidis K.T., Li X., Liu B., Luo Z., **Penton C.R.**, Schuur E.A.G., Tiedje J.M., Wang Y.-P., Wu L., Xia J., Zhou J., Luo Y. 2018. More replenishment than priming loss of soil organic carbon with additional carbon input. Nature Communications 9(1) 1375. DOI: 10.1038/s41467-018-05667-7

**25.** Liang J., Xia J., Shi Z., Jiang L., Ma S., Lu X., Mauritz M., Natali S.M., Pegoraro E., **Penton C.R.**, Plaza C., Salmon V.G., Cole J.R., Konstantinidis K.T., Tiedje J.M., Zhou J., Schuur E.A.G., Luo Y. 2018. Biotic responses buffer warming-induced SOC loss in arctic tundra. Global Change Biology DOI: 10.1111/gcb.14325

**24.** Yu J**.**, Deem L., Crow S., Deenik J., Yanagida J., **Penton C.R.** 2018. Biochar application influences microbial assemblage complexity and composition due to soil and bioenergy crop type interactions. *Soil Biology and Biochemistry.* 117:97-107.DOI:10.1016/j.soilbio.2017.11.017.

**23.** Shen Z., **Penton C.R.,** Xue C., Ly N., Ruan Y., Li R., Shen Q. 2018. Banana Fusarium wilt disease incidence is influenced by shifts of soil microbial communities under different monoculture spans. *Microbial Ecology.* 1-12. DOI:[10.1007/s00248-017-1052-5](https://doi.org/10.1007/s00248-017-1052-5" \t "_blank).

**22.** Xue C., **Penton C.R.**, Zhu C., Chen H., Duan Y., Peng C., Guo S., Ling N., Shen Q. 2018. Alterations in soil fungal community composition and network assemblage structure by different long-term fertilization regimes are correlated to the soil ionome. *Biology and Fertility of Soils*. 1-12. DOI: 10.1007/s00374-017-1241-x.

**21.** Yuan, M.M., Zhang J., Xue K., Wu L., Deng Y, Deng J., Hale L., Zhou X., He Z., Yang Y., Van Nostrand J.D., SchuurE.A.G., Konstantinidis K.T., **PentonC.R.,** ColeJ.R., Tiedje J.M., Luo Y.,Zhou J.2018. Microbial functional diversity covaries with permafrost thaw-induced environmental heterogeneity in tundra soil. *Global Change* *Biology*. DOI: 10.1111/gcb.13820.

**20.** Zhang, B., **Penton C.R**., Xue, C., Roley S.S., Guo J., Garoutte A., Zheng T., Tiedje, J.M. 2017. Soil depth and crop determinants of bacterial communities under ten biofuel cropping systems.*Soil Biology and Biochemistry*. 112: 140-152. DOI:10.1016/j.soilbio.2017.04.019.

**19.** Fu L., Li R., **Penton C.R.**, Ruan Y., Shen Z., Xue C., Li R., Shen Q. 2017. Inducing the rhizosphere microbiome by biofertilizer application to suppress banana Fusarium wilt disease. *Soil Biology and Biochemistry.*104:39-48. DOI: 10.1016/j.soilbio.2016.10.008.

**18.** Ontiveros-Valencia A., **Penton C.R.,** Krajmalnik-Brown R., Rittmann B.E. 2016. Hydrogen-fed biofilm reactors reducing selenite and sulfate: community structure and location of elemental selenium within the biofilm. *Biotechnology and Bioengineering****.*** DOI:10.1002/bit.25945

**17. Penton C.R.**, Vadakattu V.V.S.R, Yu J., Tiedje J.M. 2016. Size matters: Assessing optimum soil sample size for fungal and bacterial community structure analyses using high throughput sequencing of rRNA gene amplicons. *Frontiers in Microbiology.* DOI: 10.3389/fmicb.2016.00824.

**16.** Xue, C., **Penton C.R.**, Zhang B., Zhao M., Rothstein D.E., Mladenoff D.J., Forrester J.A., Shen Q., Tiedje J.M. 2016. Soil fungal and bacterial responses to conversion of open land to short rotation woody biomass crops.*Global Change Biology* DOI:10.1111/gcbb.12303.

**15. Penton C.R.**, Yang C., Tiedje J., Liu F., Ma J., Yuan M., Zhang J., Xue K., Van Nostrand J., Yuan T., Wu L., He X., Schuur E.A.G. Zhou J. 2016. NifH-harboring bacterial community composition across an Alaskan permafrost thaw gradient.*Frontiers in Microbiology.* DOI: 10.3389/fmicb.2016.01894.

**14.** Zhou B., **Penton C.R.**, Cole J., Tiedje J.M. 2015. Evaluation of the PGM for gene targeted studies using amplicons of the nitrogenase gene, *nifH*. *Applied and Environmental Microbiology*DOI:10.1128/AEM.00111015.

**13. Penton C.R.,** St. Louis D., Pham A., Cole J.R., Wu L., Luo Y., Schurr E.A.G., Zhou J., Tiedje J.M. 2015. Denitrifying and diazotrophic community responses to artificial warming in permafrost and prairie soils. *Frontiers in Microbiology* DOI:10.3389/fmicb.2015.00746

**12.** Xue C., **Penton C.R.,** Shen Z., Zhang R., Huang Q., Rong L. Yunze R., Shen Q. 2015. Manipulating the banana rhizosphere microbiome for the rehabilitation of severe Panama disease incidence. *Scientific Reports* DOI:10.1038/srep11124.

**11. Penton C.R.**, Deenik J., Popp B.N., Bruland G., Engstrom P., Mueller J., Worden A., St. Louis D., Tiedje J.M. 2014. Assessing nitrogen transformations in a flooded agroecosystem using the isotope pairing technique and nitrogen functional gene abundances. *Soil Science*.

**10. Penton C.R.**, Vadakattu V.V.S.R., Tiedje, J.M., Ophel-Keller K., Neate S.M., Gillings M., Harvey P., Roget D.K. 2014. Fungal community structure in disease suppressive soils assessed by 28S LSU gene sequencing. *PLoS One* 9(4):e93893.

**9. Penton C.R.**, Deeknik J., Popp B., Bruland G., Engstrom P, St. Louis D., Tiedje J.M. 2013. Importance of sub-surface rhizosphere-mediated coupled nitrification-denitrification in a flooded agroecosystem in Hawaii. *Soil Biology and Biochemistry* 57:362-373.

**8. Penton C.R.**, St. Louis D., Luo Y., Cole J., Zhou J., Schuur T., Tiedje J.M. 2013*.* Fungal diversity in permafrost and tallgrass prairie soils under experimental warming. *Applied and Environmental Microbiology* 79(22) 7063 DOI: 10.1128 /AEM.01702-13.

**7. Penton C.R.**, Johnson T., Quensen J., Tiedje J. 2013. Functional genes to assess nitrogen cycling and aromatic hydrocarbon degradation: primers and processing matter. *Frontiers in Microbiology* 17: Sept 2013 DOI: 10.3389/fmicb.2013.00279.

**6.** Sul W.J., Asuming-Brempong S., Wang Q., Tourlousse D.M., **Penton C.R.**, Rodrigues J.L.M., Adiku S.G.K, Jones J.W., Cole J.R., Tiedje J.M. 2013. Tropical agricultural land management influences on soil microbial communities through its effect on soil organic carbon. *Soil Biology and Biochemistry*DOI: 10.1016/j.soilbio.2013.05.007.

**5.** Vital M., **Penton C.R.**, Wang Q., Young V.B., Antonopoulos D.A., Sogin M.M., Morrison H.G., Harrel L., Chang E.B., Huffnagel G.B., Schmidt T.M., Cole J.R., Tiedje J.M. 2013. A gene-targeted approach to investigate the intestinal butyrate producing bacterial community. *BMC Microbiome* 1(8) 03/2013.

**4.** Engström P., **Penton C.R.**, Devol A.H. 2009. Anaerobic ammonium oxidation in deep-sea sediments off the Washington margin. *Limnology and Oceanography* 54(5):1643-1652.

**3. Penton C.R**., & Newman S. 2008. Enzyme based resource allocated decomposition and landscape heterogeneity in the Florida Everglades. *Journal of Environmental Quality.*37:972-976.

**2. Penton C.R**., & Newman S. 2007. Enzyme activity responses to nutrient loading in subtropical wetlands. *Biogeochemistry*. 84:83-98.

**1. Penton C.R.,** Devol A.H., Tiedje J.M. 2006. Molecular evidence for the broad distribution of anammox in freshwater and marine sediments. *Applied and Environmental Microbiology.*72(10):6829-6832.

**BOOK CONTRIBUTIONS**

Iwai, S., Chai B., da C Jesus E., **Penton C.R.**, Cole J.R., Tiedje J.M. 2010. Chapter 31: Gene-targeted metagenomics (GT-metagenomics) to explore the extensive diversity of genes of interest, *In*: Handbook of molecular microbial ecology I: Metagenomics and complementary approaches, Wiley-Blackwell

**Penton C.R.** 2008.Chapter 11: Anaerobic ammonium oxidation (Anammox), *In:* Permafrost Soils, Soil Biology Series. Springer Publishing. R. Margesin *ed*

**OTHER CONTRIBUTIONS**

Gupta V.V.S.R, **Penton C.R.**, Lardner R, Tiedje J. 2010. Catabolic and genetic diversity of microbial communities in Australia soils are influenced by soil type and stubble management. 19th World Congress of Soil Science, Soil Solutions for a Changing World. Aug, 1-6. <https://publications.csiro.au/rpr/download?pid=csiro:EP092078&dsid=DS3>

**PRESENTATIONS**

Yu J., Deem L.,Crow S., Deenik J., **Penton C.R.** (2018) Shotgun metagenomic based soil microbiome responses to biochar amendment. *International Society of Microbial Ecology*. Leipzig, Germany.

**Penton C.R.** (2017) Natural suppression of crop disease by manipulating the soil microbiome.

****Invited speaker, Spring Environmental Engineering Seminar Series, Biodesign Institute.

**Penton C.R.** (2017) Functional gene analysis and technical considerations for functional gene multiplexing. ASU Biodesign Institute, Center for Fundamental and Applied Microbiomics, Functional Gene Workshop

Yu J., Deem L.,Crow S., Deenik J., **Penton C.R.** (2016) Stable isotope probing (SIP)-enabled metagenomics of active microbial degraders in response to priming under biochar amended soils. *International Society of Microbial Ecology*. Montreal, Quebec, Canada.

Xue C., **Penton C.R.**, Zhang B., Guo J., Gomes E.A., Shen Q. (2016) Distinctive rhizo-microbial community between annual and perennial biofuel crops. *International Society of Microbial Ecology*. Montreal, Quebec, Canada.

Yu J., Deem L.,Crow S., Deenik J., **Penton C.R.** (2016) Stable isotope probing (SIP)-enabled metagenomics of active microbial degraders in response to priming under biochar amended soils. *Soil Science Society of America Annual Meeting*, Phoenix, AZ.

Markut C.\*, Yu J., Schuur E., Konstantinidis K., Johnston E.R., Zhou J., Tiedje J.M., **Penton C.R.** (2016) Isolating and characterization of metagenomic derived targeted microbial taxa from permafrost soils. *Soil Science Society of America Annual Meeting*, Phoenix, AZ.

**Penton C.R.,** Gupta V.V.S.R. (2016) Oral Presentation. Scalar Drivers of N-Fixing Diazotroph Community Composition in Agricultural Systems and Their Network-Derived Sensitivity to Change. *Soil Science Society of America Annual Meeting*, Phoenix, AZ.

Konstantinidis K.T., Johnston E.R., **Penton C.R**, Yu J., Wu, L. Zhou S., Guo X., Zhang P., He Z., Yuan M.M., Luo Y., Schuur E.A.G., Cole J.R., Tiedje J.M., Zhou J. (2016) Metagenomics recovers 100’s of population genomes from Alaskan permafrost and Oklahoma prairie soils and provides insights into their roles in microbial community response to warming. *Department of Energy Genomics GTL Meeting.* Washington, D.C.

**China 111 plan – The Innovative Foreign Experts Introduction Plan for the National Key Discipline of Agricultural Resources and Environment at Nanjing Agricultural University: International Workshop on Agricultural Resources and Environment** (2016).Invited presentation as part of a group of 20 international experts recruited to engage researchers and students at Nanjing Agricultural University in Nanjing, China: **Penton, C.R.** “Microbial Community and Functional Heterogeneity Across Spatial Scales: A Case for Network Resistance and Resilience”.

**Penton, C.R.** Writing Scientific Manuscripts: Common Issues in Chinese-English Language Conversion. (2016). Nanjing Agricultural University, Nanjing, China.

**Penton C.R.**, Gupta V.V.S.R., Neate S. (2015) Oral Presentation. Natural disease suppression of *Rhizoctonia* by a network of players: Evidence of direct competition and competitive exclusion. *Soil Science Society of America Annual Meeting*. Minneapolis, MN.

**Penton C.R.**, Crow S., Deenik J., Yanagida J. (2015) Practical benefits of biochar amendment to agricultural systems: Linking microbial processes to economic feasibility and sustainability. *2015 USDA-AFRI PI Meeting*, Greensboro, N.C.

**Penton C.R.** (2015) Denitrifying and diazotrophic community responses to artificial warming in permafrost and tallgrass prairie soils. *2015 Department of Energy Genomics GTL Conference*, Washington, D.C.

**Penton C.R.** (2015) Natural disease suppression of *Rhizoctonia solani* AG8 in Australian cropping systems: Drivers of spatial heterogeneity. *Nanjing Agricultural University*, Nanjing, Jiangsu Province, China.

**Penton C.R.** (2015) Natural disease suppression of *Rhizoctonia solani* AG8 in Australian cropping systems: Drivers of spatial heterogeneity. *Hainan University Research Station*, Hainan Province, China.

**Penton C.R.** (2015) Natural disease suppression of *Rhizoctonia solani* AG8 in Australian cropping systems: Drivers of spatial heterogeneity. *Xinglong Tropical Botanical Garden Spice and Beverage Crop Research Institute of China, Tropical Agriculture Research*, Datang, Hainan Province, China.

Gupta V.V.S.R, **Penton C.R.**, Tiedje J.M. (2015) Edaphic and plant associated factors regulate diazotroph diversity and function in Australian soils. *BAGECO 13, Bacterial Genetics and Ecology*, Milan, Italy. Oral Presentation.

Yu J., Crow S., Deenik J., Deem L., **Penton C.R.** (2015) The effect of biochar amendment on microbial community composition. *American Society of Microbiology Annual Meeting*. New Orleans, LA.

Gupta V.V.S.R., Neate S., **Penton C.R.**, Tiedje J.M. (2015) Biological suppression of crop disease: Role of microbial communities and microflora-faunal interactions. *Soil Science Society of America Annual Meeting*, Minneapolis, MN. Oral Presentation.

Deem L., Crow S.E., Deenik J., Meulemans J., **Penton C.R.**, Yu J (2015) The evaluation of biochar effects at both the field and laboratory scale; soil carbon, microbial community composition and carbon dioxide efflux. 5th International Symposium on Soil Organic Matter (SOM2015). Göttingen, Denmark.

**Penton C.R**., Gupta V.V.S.R, Kroker S., Hicks M., Bell M., Neate S.M., Murphy D, Smith C., Tiedje J. (2014). Diversity of diazotrophic bacteria and non-symbiotic N2-fixation in Australian cropping soils. *ASSA-CSSA-ASA International Annual Meeting.* Long Beach, CA. Oral Presentation

**Penton C.R.**, Gupta V.V.S.R., Yu J., Tiedje J.M. (2014) Soil sample size affects fungal and bacterial community structure and richness: An update using targeted amplicon sequencing. *ASSA-CSSA-ASA International Annual Meeting.* Long Beach, CA.

**Penton C.R.**, Gupta V.V.S.R., Yu J., Tiedje J.M. (2014) Soil sample size affects fungal and bacterial community structure and richness: An update using targeted amplicon sequencing. *Argonne National Lab* *Metagenomics Annual Meeting*. Lemont, IL.

**Penton C.R.**, Gupta V.V.S.R., Yu J., Tiedje J.M. (2014) Soil sample size affects fungal and bacterial community structure and richness: An update using targeted amplicon sequencing. *International Society of Microbial Ecology (ISME)*. Seoul, Korea.

Gupta V.V.S.R., **Penton C.R.**, Kroker S., Hicks M., Bell M. Neate S.M., Murphy D., Smith C., Tiedje J. (2014) Diversity of *nif*H-harbouring bacteria and non-symbiotic N2 fixation in Australian cropping soils. *Australian Nitrogen Fixation Conference (ANFC)*. Melbourne Australia.

Deem L.M., Crow S.E., Deenik J., **Penton C.R.**, Yanagida J. (2013) Biochar soil amendment for waste-stream diversion, nutrient holding capacity and carbon sequestration in two contrasting soils. *American Geophysical Union*, San Francisco, CA.

**Penton C.R.,** Gupta V.V.S.R., Tiedje J.M., Ophel Keller K, Neate S.M., Gillings M., Harvey P., Roget D.K. (2013) Oral Presentation: Fungal community structure in disease suppressive soils from the Mediterranean climatic region assessed by 28S LSU gene sequencing. *ASA-CSSA-SSSA International Annual Meeting.* Tampa, FL.

**Penton C.R.** (2013) Invited talk: Potential ecosystem function predicted by fungal and functional microbial communities and N isotope tracing. *University of Hawaii, Dept. of Tropical Plant and Soil Sciences*

**Penton C.R.**  (2013) Invited talk: Importance of sub-surface rhizosphere-mediated coupled nitrification-denitrification in a flooded agroecosystem in Hawaii. *University of Hawaii, Water Resources Research Center*

**Penton C.R.** (2013) Invited talk: Fungal and functional gene diversity as predictors of ecosystem function. *Washington State University, Crop and Soil Science Department.*

**Penton C.R.** (2013) Invited talk: Fungal and functional gene diversity as predictors of ecosystem function. *University of Houston*.

**Penton C.R.**, St. Louis D, Luo Y, Cole J, Zhou J, Schuur E.A.G., Tiedje J. (2013) Assessment of classified and unclassified fungal diversity by 28S LSU pyrosequencing in permafrost and tallgrass prairie soils subject to experimental warming. *Genomic Sciences Contractors-Grantees Meeting XI USDA-DOE Feedstock Genomics for Bioenergy Awardee Meeting 2013.*

Gupta V.V.S.R., **Penton C.R.**, Tiedje J.M., Ophel-Keller K., Neate S.M., Gillings M., Harvey P., Roget D.K. (2012) High-throughput sequencing of fungal communities in disease suppressive soils. *International Society for Microbial Ecology.* Copenhagen, Denmark.

**Penton C.R.**, Schuur E.A.G., Wu L., Zhou J., Cole J., Chai B., Pham A., St. Louis D., Tiedje J. (2012) Changes in eco-functional gene community composition as a response to artificial warming in grassland and permafrost soils. *International Society for Microbial Ecology*. Copenhagen, Denmark.

**Penton C.R.**, Schuur E.A.G., Wu L., Zhou J., Cole J., Chai B., Pham A., St. Louis D., Tiedje J. (2012) Changes in eco-functional gene community composition as a response to artificial warming. *American Society for Microbiology*. San Francisco, CA.

Schuur T., Zhou J., Wu L., Hue K., Cheng L, Yuan M., Zhang J., Deng Y., Van Nostrand J.D., He Z., **Penton C.R.**, Cole J., Tiedje J.M., Bracho-Garrillo R., Luo C., Konstantantinidis K., Xu X., Li D., Luo Y. (2011) From community structure to function: Metagenomics-enabled predictive understanding of microbial communities to climate warming in Alaska Tundra. DOE Project Meeting.

Zhou J., Wu L., Xue K., Cheng L., Yuan M., Zhang J., Deng Y., Van Nostrand J.D., He Z., **Penton C.R.**, Cole J., Tiedje J.M., Schuur T., Luo C., Konstantinindis K., Xu X., Li D., Luo Y. (2011) From Community structure to function: Metagenomics-enabled predictive understanding of microbial communities to climate warming at the temperate grassland ecosystems in Oklahoma. DOE Project Meeting.

**Penton C.R.**, Deenik J., Popp B., Engstrom P., Bruland G.L., Worden A., Brown G., Tiedje J. (2011). Oral Presentation. Use of novel whole-core incubations to measure the fate of fertilizer N in a flooded agricultural system. *American Society for Microbiology*. New Orleans, LA.

Deenik J., **Penton C.R.,** Bruland G, Tiedje J. (2010) Quantifying nitrogen loss from flooded Hawaiian taro fields. *American Geophysical Union.* San Francisco, CA.

**Penton C.R.** (2010) Deciphering the black box: Linking microbial community structure to higher-order level processes. Virginia Tech Department of Biology Seminar.

**Penton C.R.,** Deenik J., Bruland G., Tiedje J. (2010) Quantifying nitrogen transformations in flooded vegetated sediments using a novel whole core 15N technique.  *American* *Geophysical Union*. San Francisco, CA.

**Penton C.R.**, Young V., Antonopoulos D., Harrell L., Chang E.B., Wang Q., Cole J., Tiedje J. (2010) Temporal changes of bacterial butyrate functional gene communities in ulcerative colitis: A role for the gut microbiome in health and disease. *13th International Society of Microbial Ecology (ISME)*. Seattle, WA.

Gupta V.V.S.R., **Penton C.R.**, Lardner R., Tiedje J. (2010) Catabolic and genetic diversity of microbial communities in Australian soils are influenced by soil type and stubble management. *World Congress of Soil Science.* Brisbane, Australia.

Gupta V.V.S.R., **Penton C.R.**, Lardner R., Tiedje J. (2010) Response of soil microfloral communities to stubble addition differs between suppressive and non-suppressive soils. *6th Australian Soilborne Diseases Symposium*. Twin Waters, Queensland, Australia.

**Penton C.R.**, Deenik J., Bruland G., and Tiedje J.M. (2009) Nitrogen cycling in Hawaiian Taro fields. *NRI USDA Principal Investigator’s Meeting*. Washington, D.C.

**Penton C.R.** (2009) The missing link: Relating microbial community structure and function using novel molecular methods. Iowa State University, Department of Ecology, Evolution and Organismal Biology.

**Penton C.R.** Sul W.J., Tiedje J.M. (2008) Comparison of microbial community structure among diverse sediments using pyrosequencing. *12th International Society of Microbial Ecology* *(ISME)*. Cairns, Australia.

Wang Q., Chai B., Sul W., Tourlousse D.M., **Penton C.R.**, Kulam-Syed-Mohideen A.S., McGarrell D.M., Tiedje J.M., Cole J.R. (2008) A protocol for rapid and efficient bacterial community analysis using pyrosequencing. *American Society for Microbiology*. Boston, MA.

**Penton C.R.** and Tiedje J.M. (2007) Anaerobic ammonium oxidation (Anammox): A perplexing global N sink. *ASA-CSSA-SSSA International Annual Meeting.* New Orleans, LA.

**Penton C.R.**, Engstrom P., Devol A.H., Tiedje J.M. (2007) Quantitative PCR for the detection and enumeration of anammox in marine and freshwater sediments: Anammox activity predictions in the Florida Everglades. *Smithsonian* *Environmental Research Council Conference on Novel Anaerobic Pathways*. Annapolis, Maryland.

**Penton C.R.**, Engstrom P., Devol A.H., Tiedje J.M. (2007) Quantitative PCR for the detection and enumeration of anammox bacteria in marine and freshwater sediments. *American Society Limnology Oceanography*. Santa Fe, New Mexico.

Engstrom P., **Penton C.R.**, Devol A.H. (2007) The role of anammox as a nitrogen sink in deep sea sediments off the Washington Margin. *American Society Limnology Oceanography*. Santa Fe, New Mexico.

Engstrom P., **Penton C.R.**, Devol A.H. (2006) Importance of anammox to the nitrogen removal in deep Cascadia Basin sediments. *American Geophysical Union*. San Francisco, California.

Johnson H.P., Hautala S.L., Hammond D.E., Bjorklund T.A., Evans R., Esther T.,Engstrom P., Worsnopp M., Lagerloef M., Kevin J., **Penton R**., Paukert A., Chung E., Schwartz R., Morello A. (2006) Cascadia Basin Sediments as a Source of the North Pacific Silica Plume. *American Geophysical Union*, San Francisco, California.

**Penton C.R.**, Tiedje J.M. (2006) Molecular evidence for the broad distribution of anammox in aquatic sediments. *American Society of Microbiology 106th General Meeting*. Orlando, Florida.

**Penton C.R.**, Gray I. (2005) Enzyme activity and litter decomposition in the northern Everglades. *25th Annual Soil and Water Science Conference*. Seattle, Washington.

**Penton C.R.** (2004) Nutrient loading effects on enzyme regulated decomposition in the Florida Everglades. *University of Florida Annual Soil and Water Science Research Forum*. Gainesville, Florida.

Newman S., **Penton C.R.**, Jacoby M., Gray I. (2004) Integrating carbon and nitrogen with organic phosphorus turnover during litter decomposition in the Everglades. *American Society of Limnology and Oceanography*. Savannah, Georgia.

Newman S., **Penton C.R.**, Jacoby M. (2004) Enzyme mediated decomposition in wetlands. *INTECOL: International Association for Ecology.* Utrecht, The Netherlands.

Newman S., **Penton C.R.**, Gray I., Jacoby M. (2003) Litter quality versus environmental conditions: What regulates decomposition? *GEER, Joint Conference on the Science and Restoration of the Greater Everglades and Florida Bay Ecosystem “From Kissimmee to the Keys”.* Palm Harbor, Florida.

**Penton C.R.**, & Newman S. (2002) Nutrient and habitat influences on soil and detrital enzyme activity in the Everglades. *23rd Annual Soil and Water Science Conference.* Lake Placid, New York.

**GRANTS**

**External Funded Awards**

**2018-2019** National Science Foundation (NSF), solicitation NSF 17-512, DEB-1754337

**“Four – “Domain” Microbial Metagenome of the Termite Hindgut”**

Co-PI, Collaborative within the Center for Fundamental and Applied

Microbiomics (CFAM-ASU Biodesign) with PI Gillian Giles

Amount Requested: $199,995

****Responsible for bacterial and fungal community

composition, part-time funding for one PhD student

****RID recognition not available

**2016-2020** USDA AFRI (Agriculture and Food Research Initiative) 2016-67003-24962

**“Climate sensitivity of microbial processes and their implication for carbon sequestration in subtropical pastures”**

Total Budget: $710,000

****Co-PI with Univ. of Florida.

**2012-2017** USDA AFRI 2012-67020-30234

“**Practical benefits of biochar amendment to agricultural systems: Linking**

**soil and microbial processes to economic feasibility and sustainability”**

Total Budget: $480,000

****Co-PI with Univ. of Hawaii. Transferred grant.

****Delayed project implementation due to resource limitations.

**2013-2015** DOE Genomic Science Program (GTL)

**“From structure to functions: Metagenomics-enabled predictive**

**understanding of soil microbial feedbacks to climate change”**

Total Budget: ~$2,500,000

****Co-authored ~25% proposal but not listed as PI. Continued ad-hoc work

through 2016, funded post-doc

**2009-2012** USDA-NRI

“**Anammox activity and nitrogen dynamics in sub-tropical watersheds”**

Total Budget: $300,000

****Wrote ~80% of proposal as PhD student, funded post-doc work,

collaborative with the University of Hawaii

**OTHER COLLABORATIVE FUNDING\***

\* Peer-to-peer agreements recharge center agreements

**2015-2018 Design of new Illumina sequencing primers for ACC deaminase**

Commonwealth Scientific and Industrial Research Organization, Australia,

Amount: $3,000

**2015-2018 Bacterial functional communities in deep Florida aquifer samples shaped by**

**land use changes**

University of Florida, Amount: $6,000

**** Output is one manuscript in-prep

**2012-2018 Fungal Community Compositional Changes During Litter Decomposition**

**Across a P Gradient in the Florida Everglades**

South Florida Water Management District**,** Amount: $13,000

**** Output is pending submission of one manuscript

**2012-2014 Changes in Microbial Community Composition as a Response to Biochar**

**Application in Pot Trials**

University of Hawaii, Amount: $4,000

**2012-2014 Nitrogen Fixing (*NifH*) Bacterial Community Structure as a Function of**

**Stubble Amendment**

Australia Commonwealth Scientific and Industrial Research Organization

Amount: $4,700

\* Output is one manuscript in prep for submission

**2010-2015 A Molecular Approach to Unravel the Dynamics of Disease Suppressive**

**Microbial Communities**

Australian Grains Research and Development Corporation

Amount: $60,000 AU

\* Output is one published manuscript, one in prep for submission

**TEACHING**

**Curriculum Courses**

**Spring 2019** MIC 205, Microbiology, 62 students

ABS 434, Soil Ecology, 4 students

**Fall 2018** MIC 205, Microbiology, 70 students

ABS 395, Unseen Life on Earth, 10 students

**Spring 2018**  MIC 205, Microbiology, 64 students (max enrollment)

ABS 434, Soil Ecology, 8 students

ABS 499, Independent Study, 1 student

**Fall 2017** MIC 205, Microbiology, 70 students

ABS 395, Unseen Life on Earth, 8 students

**Spring 2017**  MIC 205, Microbiology, 60 students

ABS 434, Soil Ecology, 9 students

**Fall 2016** MIC 205, Microbiology, 61 students

ABS 395, Unseen Life on Earth, 8 students

**Spring 2016** ABS 591, Seminar, 2 students

MIC 205, Microbiology, 36 students

**Fall 2015** ABS 490, Seminar, 3 students

MIC 205, Microbiology, 55 students

**Spring 2015** MIC 205, Microbiology, 37 students

**Fall 2014** MIC 205, Microbiology, 53 students

**Fall 2013** Advisor and ad-hoc lecturer for CSS360, Soil Biology, ~30 students

**Fall 2012** Lab instructor and ad-hoc lecturer for CSS360, Soil Biology, ~30 students

**Fall 2011** Instructor for CSS360, Soil Biology including laboratory, ~30 students

**Teaching Assistant**

**Fall 2004** SOS 6446, Biogeochemistry of Wetlands, University of Florida

**** Developed a course book based on lecture and reading materials

**Fall 2006** MMG 433, Microbial Genomics, Michigan State University

**MENTORING**

**Graduate Students**

**2019-present** Jonathan Hileman, PhD students, SOLS (committee member)

**2017-present** Corey Nelson, Masters student, SOLS (committee member)

**2016-present** Vanessa Fernandes, PhD graduate student, SOLS (committee member)

**2014-present** Julian Yu, PhD graduate student, SOLS (Co-chair)

**** Julian is based at the School of Life Sciences since my unit does not have a

PhD program. Output is noted in presentations at national conferences, one

published primary author ms, two primary authorships in prep, two co-

authored manuscripts published

**2014-2016** Lauren Deem, Univ. Hawaii (committee member)

**** Student output is one manuscript in prep, one co-authored manuscript,

and several presentations at national conferences

**Undergraduate Lab Research Students**

**2016-2017** Collin Markut, BMB undergraduate independent study research rotation

**** Presented at Soil Science Society of American Annual Meeting

**** Continue to mentor in professional development

**2014-2016** Patherica Charoenmins, undergraduate research assistant

**2015-2016** Melvin Abraham, undergraduate research assistant

Brittany Ruis, undergraduate research assistant

Ashley Zankich, undergraduate research assistant

**2008-2014** Julian Yu, undergraduate research assistant

Derek St. Louis, undergraduate research assistant

**** Student output is 4 co-authored manuscripts

Amanda Pham, undergraduate research assistant

**** Student output is 1 co-authored manuscript

Andrew Worden, undergraduate research assistant

**** Student output is 1 co-authored manuscript

**Barrett Honor’s Theses**

Co-chair, Honor’s Thesis, Marcela Bandela (2019)

Co-chair, Honor’s Thesis, Madi Barton (2019)

**** “Antimicrobial peptide activities against the fungal infection *Pseudogymnoascus*

*destructans”*

Co-chair, Honor’s Thesis, Lindsay Lake and Eric Frazier (2017)

**** “Antimicrobial peptide activities against the fungal infection *Pseudogymnoascus*

*destructans”*

Co-Chair, Honor’s Thesis, Lilia Portales (2017)

**** “Changes to the oral microbiome after consumption of foods high in probiotics”

Co-Chair, Honor’s Thesis Xela Vitera (2017)

**** Linkages between nutrition and immunity in mammals *(completed)*

Chair for Honor’s Thesis, Patherica Charoenmins (2016)

**** “Evaluating the viability of a DNA-based chip targeted for *C. trachomatis, N. gonorrhea,* and other pathogens of interest” *(completed)*

**Mentored Research Papers**

MIC 401 research paper, Brian Stuart (2015)

**** “Biochar soil amendment as a potential enhancer of PCB contaminated soil

phytoremediation”

**International Students**

**F2017-18** Hosting Cece Qiao, visiting scholar from Nanjing Agricultural University, China

\* Originates from the Rong Li lab in the Qirong Shen group, a source of continued collaboration between our labs.

**F2018-19** Hosting Chengyuan Tao, visiting scholar from Nanjing Agricultural University

\* Continuation of the mentoring program noted above

**PROFESSIONAL SERVICE**

Editor, Biology and Fertility of Soils Journal (2017-current)

Editor, Soil Biology Letters (journal founded 12/17-current)

Special Session Seminar Chair for Soil Science Society of America Annual Meeting (2015)

“Linking crop disease with soil and rhizospheric microbial communities”

Judge for SSSA Annual Meeting Graduate Student Poster Competition (2014)

Horticulture Assistant Professor search committee (2019)

Horticulture Assistant Professor search committee (2018)

Chair, Faculty Teaching Review Committee (2016-current)

Chemistry Assistant Professor search committee (2017)

Chair, Departmental Seminars (Colloquium series) (2015-2016)

Faculty Teaching Review Committee member (2015)

Applied Ecology Major Map committee (2014-2015)

ASU Analytics@ASU Research Task Force Member (2015)

**Society Memberships**

American Society Limnology and Oceanography (2005-2007)

American Society Microbiology (Since 2004)

Crop and Soil Science Society America (Since 2006)

Soil Science Society America (Since 2006)

American Society Agronomy (Since 2006)

International Society of Microbial Ecology (Since 2005)

American Geophysical Union (2009-2011)

**Manuscript Reviews**

**Ad-hoc Reviewer for:**

Applied and Environmental Microbiology, PLoS One, Soil Biology Biochemistry, ISME Journal, Wetlands, Environmental Microbiology, Marine Drugs, Biogeochemistry, Soil Science Society of American Journal, Nature, Plant and Soil, Frontiers in Microbiology, Nature Scientific Reports, Molecular Ecology, Chemosphere, Ecological Modeling, Environmental Science and Pollution Research, Soil and Tillage Research, Crop Science

**ASU Affiliations**

**2018-present** Associate faculty of the Biodesign Institute, ASU

**2016-present** Founding board member of the ASU Center for Fundamental and Applied

Microbiomics, Biodesign Institute

**2015-present** Honor’s faculty, Barrett, The Honors College

**2014-present** Sustainability Scientist, GIOS