

SINDHU JAGADAMMA, PH.D.

Assistant Professor

Biosystems Engineering & Soil Science

University of Tennessee

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Research Interests

Agroecosystem sustainability, soil-crop management, carbon sequestration, greenhouse gas budgeting, nutrient and carbon cycling, carbon-water-nutrient coupling, climate change, contaminant biodegradation

Education

Ph.D. (Soil Science): The Ohio State University (2009)

M.S. (Soil Science): The Ohio State University (2005)

B.Sc. (Agricultural Sciences): Kerala Agricultural University, India (1994)

Professional Appointments

- **Postdoctoral Researcher**, Civil and Environmental Engineering, University of TN, Knoxville, TN & Biosciences Division, Oak Ridge National Laboratory, Oak Ridge, TN (2014-March 2016, Supervisor: Terry Hazen)
 - ✓ Geochemistry- and microbiology-focused research on remediation of contaminated groundwater and sediments
- **Postdoctoral Researcher**, Environmental Sciences Division & Climate Change Science Institute, Oak Ridge National Laboratory, Oak Ridge, TN (2010-2013, Supervisor: Melanie Mayes)
 - ✓ Process-based understanding of soil carbon cycling
- **Graduate Research Associate**, The Ohio State University, Columbus, OH (2006-1009)
 - ✓ Long-term effect of tillage practices on carbon sequestration in Midwestern US agro-ecosystems
 - ✓ Field-scale greenhouse gas budgeting in response to tillage practices in agro-ecosystems
- **Fellow-Ford Foundation's International Fellowships Program**, Pursued Masters Program at The Ohio State University (2003-2005)
 - ✓ Effect of long-term nitrogen fertilization and crop rotation on sustainable crop production in Midwestern US agro-ecosystems
 - ✓ Prediction of most responsive soil properties for crop productivity and soil quality
- **Senior Research Fellow**, Center for Application of Systems Simulation, Indian Agricultural Research Institute, New Delhi, India (2001-2002)
 - ✓ Evaluation of the impact of climate change on agriculture by mining published data
- **Soil Survey Officer**, Kerala Department of Agriculture, India (1998-2000)
 - ✓ Soil classification at county level and preparation of soil maps and reports
- **Field Extension Officer**, Kerala Horticultural Development Program, India (1996-1998)
 - ✓ Training vegetable growers on sustainable crop production

Publications (Google Scholar citations: 348, H index: 10)

1. Paradis, C.J., **Jagadamma, S.**, Watson, D.B., McKay, L.D., Hazen, T.C., Park, M., and Istok, J.D. 2016. In situ mobility of uranium in the presence of nitrate following sulfate-reducing conditions. *J. Contam. Hydrol.* 187: 55-64
2. Wang, G., **Jagadamma, S.**, Mayes, M.A., Schadt, C.W., Steinweg, J.M., Gu, L., and Post, W.M. 2015. Microbial dormancy improves development and experimental validation of ecosystem model. *ISME J.* 9: 226-237
3. **Jagadamma, S.**, Mayes, M.A., Steinweg, J.M., and Schaeffer, S.M. 2014. Substrate quality alters microbial mineralization of added substrate and soil organic carbon. *Biogeosci.* 11: 4665–4678
4. **Jagadamma, S.**, Steinweg, J.M., Mayes, M.A., Wang, G., and Post, W.M. 2014. Decomposition of added and native organic carbon from physically separated fractions of diverse soils. *Biol. Fertil. Soils* 50: 613-621
5. **Jagadamma, S.**, Mayes, M.A., Zinn, Y.L., Gísladóttir, G., and Russell, A.E. 2014. Sorption of organic carbon compounds to the fine fraction of surface and subsurface soils. *Geoderma* 213:79-86
6. Petridis, L., Ambaye, H., **Jagadamma, S.**, Kilbey II, S.M., Lokitz, B.S., Lauter, V., and Mayes, A. 2013. Spatial arrangement of organic compounds on a model mineral surface: Implications for soil organic matter stabilization. *Environ. Sci. Technol.* 48: 79-84
7. **Jagadamma, S.**, and Mayes, M.A. 2013. The role of sorption on mineralization of carbon in soils. *JSM Environ. Sci. Ecol.* 1: 1005
8. Steinweg, J.M., **Jagadamma, S.**, Frerichs, J., and Mayes, M.A. 2013. Activation energy of extracellular enzymes in soils from different biomes. *PLoS ONE* 8(3): e59943
9. Mayes, M.A., **Jagadamma, S.**, Ambaye, H., Petridis, L., and Lauter, V. 2013. Neutron reflectometry reveals the internal structure of natural organic matter deposited onto an aluminum oxide. *Geoderma* 192: 182-189
10. Wang, G., Post, W.M., Mayes, M.A., Frerichs, J.T., and **Jagadamma, S.** 2012. Parameter estimation for models of ligninolytic and cellulolytic enzyme kinetics. *Soil Biol. Biochem.* 48: 28-38
11. **Jagadamma, S.**, Mayes, M.A., and Phillips, J.R. 2012. Selective sorption of dissolved organic carbon compounds by temperate soils. *PLoS ONE* 7(11): e50434
12. **Jagadamma, S.**, and Lal, R. 2010. Integrating physical and chemical fractionation methods for isolating stable soil organic carbon. *Geoderma* 158: 322-330
13. **Jagadamma, S.**, Lal, R., Ussiri, D., Trumbore, S.E., and Mestelan, S. 2010. Evaluation of structural chemistry and radiocarbon age of recalcitrant soil organic carbon isolated by wet oxidation methods. *Biogeochem.* 98: 29–44
14. **Jagadamma, S.**, and Lal, R. 2010. Distribution of organic carbon in physical fractions of soils as affected by agricultural management. *Biol. Fertil. Soils* 46: 543–554
15. **Jagadamma, S.**, Lal, R., and Rimal, B.K. 2009. Effects of topsoil depth and soil amendments on corn yield and properties of two alfisols in central Ohio. *J. Soil Water Conserv.* 64: 70-80
16. **Jagadamma, S.**, Lal, R., Hoefl, R.G., Nafziger, E.D., and Adee, E.A. 2008. Nitrogen fertilization and cropping system impacts on soil properties and their relationship to crop yield in the central Corn Belt, USA. *Soil Till. Res.* 98: 120-129

17. **Jagadamma, S.**, Lal, R., Hoef, R.G., Nafziger, E.D., and Adee, E.A. 2007. Nitrogen fertilization and cropping systems effects on soil organic carbon and total nitrogen pools under chisel-plow tillage in Illinois. *Soil Till. Res.* 95: 348-356

Conference Presentations (lead author only)

1. **Jagadamma, S.**, Paradis, C.P., Olesen, S.W., Rocha, A.M., Joyner, D.C., Fortney, J.L., Watson, D.B., Elias, D.A., Mehlhorn, T.L., Earles, J.E., Lowe, K.A., Zhang, P., Chakraborty, R., Fields, M.W., Adams, M.W.W., Zhou, J., Alm, E.J., Hazen, T.C. 2015. The memory effect: investigating the exposure history dependence of electron donor biodegradation rates in groundwater. American Society of Microbiology Meeting (poster). May 29 – June 2. New Orleans, LA.
2. **Jagadamma, S.**, Mayes, M.A., Steinweg, J.M. 2013. Influence of substrate chemistry on organic carbon decomposition and microbial community composition. Soil Ecology Society Meeting (oral). June 11-14. Camden, NJ
3. **Jagadamma, S.**, Steinweg, J.M., and Mayes, M.A. 2012. Mineral control on organic carbon decomposition from soils of diverse eco-regions. ASA-CCSA-SSSA International Annual Meetings (oral). Oct 21-24. Cincinnati, OH
4. **Jagadamma, S.**, Mayes, M.A., Steinweg, J.M., Post, W.M., and Wang, G. 2011. Biological and physico-chemical processes of soil organic matter cycling in diverse soils. AGU Fall Meeting (poster). Dec 5-9. San Francisco, CA
5. **Jagadamma, S.**, Mayes, M.A., Heal, K.R., Philips, J., and Jardine, P.M. 2010. Compound-specific sorption of dissolved organic carbon on different soils. AGU Fall Meeting (oral). Dec 13-17. San Francisco, CA
6. **Jagadamma, S.**, Heal, K.R., Mayes, M.A., Phillips, J.R., Tschaplinski T.J., and Amonette, J.E. 2010. Sorption selectivity of dissolved organic compounds to different soils. ASA-CCSA-SSSA International Annual Meetings (poster). Oct 31- Nov 4. Long Beach, CA
7. **Jagadamma, S.**, Lal, R., Ussiri, D., Trumbore, S.E., and Mestelan. 2008. Efficiency of wet oxidation methods for isolating stable soil organic carbon. ASA-CCSA-SSSA International Annual Meetings (poster). Oct 5-9. Houston, TX
8. **Jagadamma, S.**, Lal, R., Hoef, R.G., Nafziger, E.D., and Adee, E.A. 2006. Principal component analysis for soil quality rating in the Mollisols of Northwestern Illinois. 18th World Soil Science Congress (poster). July 9-15. Philadelphia, PA
9. **Jagadamma, S.**, Lal, R., Hoef, R.G., and Adee, E.A. 2005. Effects of nitrogen fertilization and crop rotation on soil carbon and nitrogen pools on a silt loam soil in Westcentral Illinois. SSSA Annual Meeting (poster). Nov 6-9. Salt Lake City, UT
10. **Jagadamma, S.**, Lal, R., Hoef, R.G., Nafziger, E.D., and Adee, E.A. 2005. Nitrogen fertilization and cover cropping impacts on soil carbon sequestration on a silt loam soil in west central Illinois. Third USDA symposium on greenhouse gases and carbon sequestration, Baltimore (poster). March 21-24. Baltimore, MD

Grants

- University of Tennessee Institute of Agriculture, Instrument Purchase Grant, Co-PI, 2016 (\$68,747)
- University of Tennessee Institute of Agriculture International Programs, International Research Initiation Grant, Co-PI, 2016 (\$7,914)

- Department of Energy's Ecosystems and Networks Integrated with Genes and Molecular Assemblies Discovery Grant, "Are abiotic parameters or microbial communities a dominant driver for the system response: A Microbial Swap Approach", Co-PI, 2015 (**\$150,000**)
- Oak Ridge National Laboratory Director's Research and Development Program, "Incorporating molecular-scale mechanisms stabilizing soil organic carbon into terrestrial carbon cycle models", Co-PI, 2010 (**\$699,900**)
- Ohio Agricultural Research and Development Center, Graduate Student Research Grant, The Ohio State University, PI, 2007 (**\$5000**)
- Ray Travel Grant, Council of Graduate Students, The Ohio State University, PI, 2006 (**\$650**)
- Ford Foundation's International Grant for the Masters program at The Ohio State University, PI, 2003 (**\$143,000**)

Beamline Proposals

- Mayes, M.A., **Jagadamma, S.**, Petridis, L., Ambaye, H., Kilbey, M. and Lauter, V. The role of nanoscale structure on bioavailability of organic carbon stabilized on mineral surfaces. Beamline 4A, Spallation Neutron Source, Oak Ridge National Laboratory (2013)
- Mayes, M.A., **Jagadamma, S.**, Petridis, L., Ambaye, H., Kilbey, M. and Lauter, V. Biodegradability of organic carbon stabilized on mineral surfaces – Sample preparation and characterization. Center for Nanophase Material Science, Oak Ridge National Laboratory (2013)
- Mayes, M.A., **Jagadamma, S.**, Petridis, L., Ambaye, H., Kilbey, M. and Lauter, V. 2012. Neutron probing to determine the nanoscale structure of organic carbon stabilized on mineral surfaces. Beamline 4A, Spallation Neutron Source, Oak Ridge National Laboratory (2012)
- Mayes, M.A., **Jagadamma, S.**, Ambaye, H. and Ivanov, I. Molecular-scale structural characterization of organic carbon stabilized on mineral surfaces. Center for Nanophase Material Science, Oak Ridge National Laboratory (2012)
- Mayes, M.A., **Jagadamma, S.**, Ambaye, H. and Ivanov, I. Application of neutron reflectometry for structural characterization of organic carbon- mineral interface. Beamline 4A, Spallation Neutron Source, ORNL (2011)
- Mayes, M.A., **Jagadamma, S.**, Ambaye, H. and Ivanov, I. Sample deposition for applying neutron reflectometry technique at organic carbon–soil mineral interface. Center for Nanophase Material Science, ORNL (2011)

Teaching and Mentoring

- **Dissertation Research Committee member**, Candace Wilson (MS student) and Lidong Li (PhD student), Department of Biosystems Engineering and Soil Science, University of TN (2014-Present)
- **Research Mentor**, 2 undergraduate students at University of TN and 3 students at Oak Ridge National Laboratory (2010-Present)
- **Curriculum Developer**, The Ohio State University, Assisted module development for a graduate level course 'Characterization of Soil in the Field and Laboratory (2009-2010)
- **Graduate Teaching Associate**, The Ohio State University, Developed course materials and co-taught an undergraduate level course 'Soils in Our Environment' (2009)
- **Teaching Assistant (Volunteer)**, The Ohio State University, Co-taught an undergraduate level course 'Soil Science Lab' (2004)

Press Releases

- Featured on Department of Energy's Women@Energy website
<http://www.energy.gov/diversity/articles/women-energy-sindhu-jagadamma>
- Opening the black box of soil carbon science: A day in the life of Sindhu Jagadamma. Featured on "A Day in the Life" segment of *Soil Horizons*. Soil Science Society of America 2014) 55 (1) doi:10.2136/sh2014-55-1-dl
- ORNL researchers use neutron analysis to understand soil carbon cycling - Press release by Oak Ridge National Laboratory
<http://www.ornl.gov/ornl/news/features/2013/qa-with-sindhu-jagadamma>

Awards

- Outstanding Postgraduate Research Award, Environmental Sciences Division, Oak Ridge National Laboratory, TN (2013)
- Postdoctoral Research Associate Fellowship, Oak Ridge National Laboratory, TN (2010)
- Outstanding Graduate Student Award, Association of Agricultural Scientists of Indian Origin (2008)
- National Eligibility Test for Assistant Professorship, Agricultural Service Recruitment Board, India (1998)
- Ranked first in the Public Service Commission Examination for the position of Soil Survey Officer, India (1997)
- Research fellowship from Potash Research Institute of India for the Master of Science program at the Kerala Agricultural University, India (1994)

Honors and Memberships

- American Society of Microbiology (2015)
- Soil Ecology Society (2012-Present)
- American Geophysical Union (2010-Present)
- Soil Science Society of America (2004-Present)
- Agronomy Society of America (2007-Present)
- Sigma Xi Associate Member (2005)
- Gamma Sigma Delta Honor Society (2005)

Professional Services

- **Editorial board member**
 - ✓ JSM Environmental Science & Ecology, African Journal of Agricultural Research
- **Manuscript reviewer**
 - ✓ Environmental Science and Technology, Journal of Environmental Quality, Biogeochemistry, Soil Science Society of America Journal, Geoderma, Agriculture Ecosystem and Environment, Biogeosciences, Environmental and Pollution Research, Biology and Fertility of Soils, Plant and Soil, Soil and Land Use Management, Pedosphere, African Journal of Agricultural Research, JSM Environmental Science and Ecology, Internal reviewer for ORNL

- **Proposal reviewer**
 - ✓ Office of Biological and Environmental Research - United States Department of Energy, National Science Foundation, German Research Foundation, Graduate Students Research Proposals at Ohio State University
- **Scientific Judge**
 - ✓ Student presentations at the Third Annual Southeastern Biogeochemistry Symposium (2016), Graduate student applications for the GEM fellowship (2015), Student presentations at the Soil Ecology Society Meeting (2013)
- **Committee member**
 - ✓ Women in Science committee, American Society of Agronomy (2014-2016)

Academic/Volunteer Services

- Member, International Committee, Postdoctoral Association, ORNL (2013)
- Seminar coordinator, Climate Change Science Institute and Young Evolving Scientists Seminar Series, Oak Ridge National Laboratory (2012-2014)
- Scorekeeper, Tennessee High School Science Bowl (2012)
- Member, Graduate Women in Science and Engineering (GWISE) (2006-2009)
- Member, Gradroot Student Organization, School of Environment and Natural Resources, The Ohio State University (2005-2009)
- Vice President, Soil Science Community, The Ohio State University (2007)
- Member, Academic Affairs Committee, School of Environment and Natural Resources, The Ohio State University (2006-2007)
- Gradroot Representative, Council of Graduate Students, The Ohio State University (2006)

Collaborators & Other Affiliations

- **Collaborators**
 - ✓ Gangsheng Wang (Oak Ridge National Lab), Xinhua Yin (U Tennessee), David Watson (Oak Ridge National Lab), Haile Ambaye (Oak Ridge National Lab), Loukas Petridis (Oak Ridge National Lab), Valeria Lauter (Oak Ridge National Lab), Sean Schaeffer (U Tennessee), Kim Magrini (Natural Renewable Energy Lab), Jim Amonette (Pacific Northwest National Lab), Julie Jastrow (Argonne National Lab), Yuri Zinn (Federal U Lavras, Brazil), Guðrún Gísladóttir (U Iceland), Ann Russell (Iowa State U), Megan Steinweg (Roanoke College), Naveen Adusumilli (Louisiana State U)
- **Graduate and postdoctoral advisors**
 - ✓ Terry Hazen, Postdoc Advisor, University of Tennessee & Oak Ridge National Laboratory
 - ✓ Melanie Mayes, Postdoc Advisor, Oak Ridge National Laboratory
 - ✓ Warren Dick, Postdoc Advisor, Ohio State University
 - ✓ Rattan Lal, PhD & MS Advisor, Ohio State University