

# BRIAN K. SLATER

ASSOCIATE DIRECTOR  
ASSOCIATE PROFESSOR  
SCHOOL OF ENVIRONMENT AND NATURAL RESOURCES  
THE OHIO STATE UNIVERSITY  
2021 COFFEY ROAD  
COLUMBUS OH 43210  
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## Research and Education Focus

Soil Science (Pedology), Digital Soil Mapping, Soil Diversity, Geospatial Information, Soil Hydrology, Sustainable Soil Management, Urban Soils.

## Education

Ph.D. Soil Science University of Wisconsin-Madison 1994  
M.Agr.Sc. Soil Science University of Queensland, Brisbane, Australia, 1987  
B.Agr.Sc. Land Resources University of Queensland, Brisbane, Australia, 1980

## Experience

### *Employment*

2014-present Associate Director, School of Environment and Natural Resources, The Ohio State University  
2005-present Associate Professor, OSU-SENR  
1997-2005 Assistant Professor, OSU-SENR  
1983-1997 Land Resources Scientist, Senior Soil Scientist, Queensland Departments of Primary Industries and Natural Resources.

## Awards and Acknowledgements

The Ohio State University:

Rodney F. Plimpton Outstanding Teacher Award, 2011 (CFAES)

Pomerene Departmental Teaching Award, 2007 (SENR)

Association of Ohio Pedologists

Pedologist Merit Award, 2011

Queensland Department of Natural Resources

Mark of Achievement, 1997

## Peer Reviewed Journal Articles

- Salas, E.A.L., Subburayalu, S.K., Slater, B., Zhao, K. Bhattacharya, B., Tripathy, R., Das, A., Nigam, R., Dave, R. and Parekh, P. (2019): Mapping crop types in fragmented arable landscapes using AVIRIS-NG imagery and limited field data, *International Journal of Image and Data Fusion*, December, 2019. DOI: 10.1080/19479832.2019.1706646
- Burgos-Hernandez, T., Slater, B.K., Shaffer, J. (2019). Characterizing minimally disturbed soils in a highly disturbed urban environment. *Agrosystems, Geosciences & Environment*. 2(1). doi:10.2134/age2019.07.0053.
- Tirado-Corbalá, R., Slater, B.K., Dick, W., Bigham, J., and Muñoz-Muñoz, M. (2019). Gypsum amendment effects on micromorphology and aggregation in no-till Mollisols and Alfisols from western Ohio, USA. *Geoderma Regional*. Volume 15. eOO217. doi:10.1016/j.geodrs.2019.e00217
- Burgos Hernández, T.D., Slater, B.K., Tirado Corbalá, R., Shaffer, J.M. (2019). Assessment of long-term tillage practices on physical properties of two Ohio soils. *Soil and Tillage Research*, 186, 270-279. doi:10.1016/j.still.2018.11.004
- Massawe, B.H.J., Kaaya, A.K. and Slater, B.K. (2019). Involving small holder farmers in the agricultural land use planning process using Analytic Hierarchy Process in rice farming systems of Kilombero Valley, Tanzania. *African Journal of Agricultural Research*. 14 (7), 395–405. <https://doi.org/10.5897/AJAR2018.13714>
- Massawe, B.H.J., Subburayalu, S.K., Kaaya, A.K., Winowiecki, L., Slater, B.K. (2018). Mapping numerically classified soil taxa in Kilombero Valley, Tanzania using machine learning. *Geoderma* 311, 143–148 doi:10.1016/j.geoderma.2016.11.020
- Tirado-Corbalá, R., Slater, B.K., Dick, W.A., Barker, D. (2017). Alfalfa responses to gypsum application measured using undisturbed soil columns. *Plants*, 6 (3), 29 doi:10.3390/plants6030029
- Sonmez, N.K., Slater, B. (2016). Measuring intensity of tillage and plant residue cover using remote sensing. *European Journal of Remote Sensing*, 49, 121-135. doi:10.5721/EuJRS20164907
- Alam, F., Bigham, J., Dick, W.A., Slater, B., Chen, L., Lee, Y.B. (2014). Enzyme activities in soil treated with sulfite- or sulfate-based flue gas desulfurization products. *Biology and Fertility of Soils*, 50 (6), 991-995. doi:10.1007/s00374-014-0915-x
- Subburayalu, S.K., Jenhani, I., Slater, B.K. (2014). Disaggregation of component soil series on an Ohio County soil survey map using possibilistic decision trees. *Geoderma*, 213, 334-345. doi:10.1016/j.geoderma.2013.08.018
- Tirado-Corbalá, R., Slater, B.K., Dick, W.A., Bigham, J., McCoy, E. (2013). Hydrologic properties and leachate nutrient responses of soil columns collected from gypsum-treated fields. *Soil & Tillage Research*, 134, 232-240. doi:10.1016/j.still.2013.08.007

- Subburayalu, S.K., Slater, B.K. (2013). Soil series mapping by knowledge discovery from an Ohio county soil map. *Soil Science Society of America Journal*, 77 (4), 1254-1268. doi:10.2136/sssaj2012.0321
- Tirado-Corbalá, R., Slater, B.K. (2010). Soil compaction effects on the establishment of three tropical tree species. *Arboriculture & Urban Forestry*, 36 (4), 164-170.
- Chen L., Ramsier, C., Bigham, J., Slater, B., Kost, D., Lee, Y.B., and Dick, W.A. (2009). Oxidation of FGD-CaSO<sub>3</sub> and effect on soil chemical properties when applied to the soil surface. *Fuel*, 88, 1167-1172.
- Mishra, U., Lal, R., Slater, B., Calhoun, F., Liu, D., and Van Meirvenne, M. (2009). Predicting Soil Organic Carbon Stock Using Profile Depth Distribution Functions and Ordinary Kriging. *Soil Science Society of America Journal*, 73(2), 614-621.
- Venteris, E.R. and B.K. Slater. (2005). A comparison between contour elevation data sources for DEM creation and soil carbon prediction, Coshocton, Ohio. *Transactions in GIS*, 9, 179-198.
- Shukla, M.K., Slater, B.K., Lal, R., Cepuder, P. (2004). Spatial variability of soil properties and potential management classification of a chernozemic field in lower Austria. *Soil Science*, 169 (12), 852-860.
- Tan, Z.X., Lal, R., Smeck, N.E., Calhoun, F.G., Slater, B.K., Parkinson, B., Gehring, R.M. (2004). Taxonomic and geographic distribution of soil organic carbon pools in Ohio. *Soil Science Society of America Journal*, 68, 1896-1904.
- Calhoun, F.G., Bigham, J.M., Slater, B.K. (2002). Relationships among plant available phosphorus, fertilizer sales, and water quality in northwestern Ohio. *Journal of Environmental Quality* 31 (1), 38-46
- Calhoun, F.G., Baker, D.B., Slater, B.K. (2002). Soils, water quality, and watershed size: interactions in the Maumee and Sandusky River basins of Northwestern Ohio. *Journal of Environmental Quality* 31 (1), 47-53
- Calhoun, F.G., Smeck, N.E., Slater, B.K., Bigham, J.M., Hall, G.F. (2001). Predicting bulk density of Ohio soils from morphology, genetic principles, and laboratory characterization data. *Soil Science Society of America Journal* 65 (3), 811-819
- Thwaites, R.N. Slater, B.K. (2000). Soil-landscape resource assessment for plantations—a conceptual framework towards an explicit multi-scale approach. *Forest Ecology and Management* 138 (1-3), 123-138
- Loch, R.J., Slater, B.K., Devoil, C. (1998). Soil erodibility (Km) values for some Australian soils. *Australian Journal of Soil Research* 36 (6), 1045-1056
- Irvin, B.J., Ventura, S.J., Slater, B.K. (1997) Fuzzy and isodata classification of landform elements from digital terrain data in Pleasant Valley, Wisconsin. *Geoderma* 77 (2-4), 137-154
- Graham, T.W.G., Clark R.A., Knights, P.T., Lawrence, D.N., Murphy, R., Slater, B.K., and Warrion, C.M. (1991) Pasture management: current and recommended stocking rates in the Maranoa region, Queensland. *Tropical Grasslands* 25, 227-228

## Chapters in Edited Books

Slater B.K. (2018). Soil health assessment and inventory: Indices and databases. pp. 3-21 In: Reicosky, D., (eds), *Managing Soil Health for Sustainable Agriculture: Volume 2 Monitoring and Management*. Burleigh Dodds Science Publishing, Cambridge, United Kingdom. DOI: 10.19103/AS.2017.0033.17.

Massawe B.H.J., Slater B.K., Subburayalu S.K., Kaaya A.K., Winowiecki L. (2016) Updating legacy soil maps for climate resilient agriculture: a case of Kilombero Valley, Tanzania. pp. 345-364 In: Lal, R., Kraybill, D., Hansen, D.O., Singh, B.M., Mosogoya, T., Eik, L.). (eds) *Climate Change and Multi-Dimensional Sustainability in African Agriculture*. Springer, Cham, Switzerland. DOI: 10.1007/978-3-319-41238-2\_19.

Hewitt, A.E., McKenzie, N.J., Grundy M.J., Slater B.K. (2008). Qualitative survey. pp. 285–306 In: McKenzie N.J., Webster R., Grundy M.J., Ringrose-Voase A.J.(eds) *Guidelines for Surveying Soil and Land Resources. 2nd Edition*. Australian Soil and Land Survey Handbook Volume 2. CSIRO Publishing: Melbourne, Australia. DOI: 10.1071/9780643095809.

Slater, B. (2006). Spatial Variability. pp 1670-1674 In: Lal, R. (eds.), *Encyclopedia of Soil Science, Second Edition: Volume 2*. Taylor and Francis, CRC Press, Boca Raton, FL.

Ventura, S.J., Irvin, B.J., Slater, B.K., and McSweeney. K. (1996). Data structures for representation of soil stratigraphy. pp. 63-68 In: Goodchild, M.F., Steyaert, L.T., Parks, B.O., Johnston, C., Maidment, D., Crane, M., and Glendinning, S. (eds) *GIS and Environmental Modeling: Progress and Research Issues*. John Wiley and Sons Inc., New York.

Slater, B.K., McSweeney, K., Ventura, S.J., Irvin, B.J., and McBratney, A.B. (1994). A spatial framework for integrating soil-landscape and pedogenic models. pp. 169-185 In: Bryant, R.B. and Arnold, R.W. (eds) *Quantitative Modeling of Soil Forming Processes*. Chapter 10. Special Publication 39. Soil Science Society of America, Madison WI. DOI: 10.2136/sssaspecpub39.c10.

McSweeney, K., Slater, B.K., Hammer, R.D., Bell, J.C. Gessler, P.E., and Petersen, G.W. (1994). Towards a new framework for modeling the soil-landscape continuum. pp. 127-145 In: Amundson, R., Singer, M., and Hardin, J. (eds): *Factors of Soil Formation: A Fiftieth Anniversary Retrospective*. Chapter 8. Special Publication 33. Soil Science Society of America, Madison WI. DOI: 10.2136/sssaspecpub33.c8.

## Bulletins and Technical Reports

Slater, B.K. and Mancl, K. (2019) Soil Evaluation for Home Septic Systems, OSU Extension, Agriculture and Natural Resources Fact Sheet. AEX-742-04.

Mancl, K. and Slater, B.K. (2019). Septic System Care and Maintenance. OSU Extension, Agriculture and Natural Resources Fact Sheet. AEX-740.

Mancl, K. and Slater, B.K., and P. Cashell (2019). Septic Tank: Mound System. OSU Extension, Agriculture and Natural Resources Fact Sheet. AEX-744.

Mancl, K. and Slater, B.K. (2019). Why Do Septic Systems Malfunction? OSU Extension, Agriculture and Natural Resources Fact Sheet. AEX-741.

Slater, B. K and T. Wilson (2018). Miamian: Ohio State Soil. Soil Science Society of America, Soils for Teachers.

<https://www.soils4teachers.org/files/s4t/k12outreach/oh-state-soil-booklet.pdf>

Mancl, K. and Slater, B.K. (2016). Septic Tank: Soil Adsorption System. OSU Extension, Agriculture and Natural Resources Fact Sheet. AEX-743.

Mancl, K. and Slater, B.K. (2016). Using Soil to Remove Pollutants from Wastewater. OSU Extension, Agriculture and Natural Resources Fact Sheet. OSU Extension, Agriculture and Natural Resources Fact Sheet. AEX-745.

Mancl, K. and Slater, B.K. (2016). Sand Bioreactors for Onsite Wastewater Treatment. OSU Extension, Agriculture and Natural Resources Fact Sheet. OSU Extension, Agriculture and Natural Resources Fact Sheet. AEX-754.

Mancl, K.M and Slater, B.K. (2013). Suitability of Ohio Soils for Treating Wastewater. OSU Extension, Agriculture and Natural Resources. Bulletin. 896.

Dontsova, K., Lee, Y.B., Slater, B.K. and Bigham, J.M. (2005). Gypsum for Agricultural Use in Ohio—Sources and Quality of Available Products. OSU Extension, Agriculture and Natural Resources Fact Sheet. ANR-20.

## Research Funding

2017-2020. NASA. Using AVIRIS imagery to map spatial variability of soil carbon across diverse agricultural management systems. PIs: Sakthi Kumaran Subburayalu, Brian Slater, Kaiguang Zhao. \$148,207.

2015-2019. OSU Office of Energy and Environment. Soil Quality and Carbon Balance for Ohio State University Soils. PI : B. K. Slater with Tania Burgos Hernandez, PhD. Student. \$15,000.

2014-2016. USDA/NRCS Soil Survey Collaborative Grant. Gridded Soil Series Mapping by Disaggregation of Soil Mapping Units Over Large Areas. PIs: B.K. Slater and S.K. Subburayalu, \$111,658.

2013. USAID/UC-Davis Norman E. Borlaug Leadership Enhancement in Agriculture Program. Digital Soil Mapping and GIS-based Land Evaluation for Rice Production in Kilombero Valley, Tanzania PI: B.K. Slater with Boniface Massawe, PhD student. \$19,987.

2008-2009. USDA Natural Resources Conservation Service - Kresge Foundation. Soil-specific yield potentials for major Ohio crops. PI: B.K. Slater. \$8,000. Contract Number: GRT00013611

2006-2009. USDA Natural Resources Conservation Service. Conversion of Ohio state soil characterization database to national standards. Subcontract with University of Idaho. PI: B.K. Slater. \$46,000. Contract Number: GRT00016908

2005-2008. Ohio Coal Development Office. Research and demonstration of beneficial agricultural uses of FGD-products in Ohio. PI: W.A. Dick, Co-PIs: B.K. Slater, R.W. Mullen, J.M. Bigham, \$170,362. Grant/Contract Number: GRT00002064.

2004-2006. Ohio Department of Natural Resources, Ohio Coastal Management Program. Hydrologic investigations at Mentor Marsh. PIs: B.K. Slater and C. Davis, \$50,000. Grant/Contract Number: GRT00001109

2004-2006. USDA Natural Resources Conservation Service - Kresge Foundation. Ohio Cooperative Soil Survey Digitizing Enhancement Program, Part 2. PIs: B.K. Slater and N. Smeck \$116,000.

2002-2006. USDA Natural Resources Conservation Service - Kresge Foundation. Ohio cooperative soil survey digitizing enhancement program. PIs: B.K. Slater and N. Smeck. \$242,000. Grant/Contract Number: GRT960449.

2000-2006. Ohio Lake Erie Protection Fund. A hydrologic assessment of the Mentor Marsh, Lake County, Ohio. \$91,617. PIs: B.K. Slater and C. Davis \$91,617. Grant/Contract Number: GRT868308.

2004-2005. Ohio Space Grant Consortium/NASA. Ohio geospatial program for agriculture and natural resource applications. PIs: B.K. Slater and N. Watermeier. \$11,260.

2003-2005. Ohio Coal Development Office. Beneficial agricultural uses of FGD-products in Ohio. PI W.A. Dick, Co-PIs J.M. Bigham, B.K. Slater \$170,052. Grant/Contract Number: GRT961831.

1999-2003. Ohio Lake Erie Protection Fund. Phase one development of a comprehensive GIS for Mentor Marsh and its proximal watershed. \$7,445. Research Contract. PIs B.K Slater and C. Davis. Grant/Contract Number: GRT867110

## Teaching

### Current Courses

ENR 5260 Soil Landscapes: Morphology, Genesis and Classification  
ENR 5279 Urban Soils: Assessment and Restoration  
ENR 5797 Education Abroad: Iceland Environment and Culture

## Graduate Advising

- Doctoral Students (Dissertation Advisor)

2019-present	Shib Pattadar.
2017-present	Hengkang Zhao.
2016-present	Omar Abdelmatloub.
2015-2019	Tania Burgos-Hernandez. Graduating 2020. Investigating Soil Quality and Carbon Balance for Ohio State University Soils. Current Position: Lecturer, SENR, The Ohio State University.
2014-2017	Emma Kurth. Graduated: 2017. Three field studies to examine cropping management effects on runoff quantity and quality, soil water content and temperature, and selected soil quality indicators. Current Position: Lecturer, Columbus State Community College, Columbus, OH.
2012-2015	Boniface Massawe. Graduated 2015. Digital Soil Mapping and GIS-based Land Evaluation for Rice Suitability in Kilombero Valley, Tanzania. Current Position: Lecturer, Sokoine University of Agriculture, Morogoro, Tanzania.
2007-2010	Rebecca Tirado-Corbala. Graduated: 2010. A Lysimeter Study of Vadose Zone Porosity and Water Movement in Gypsum Amended Soils. Current Position: Associate Researcher, University of Puerto Rico, Mayaguez, PR.

- 2005-2008 Sakthi Subburayalu. Graduated: 2008. Application of machine learning for soil survey updates: A case study in southeastern Ohio. Current Position: Research Assistant Professor, Central State University, Wilberforce, OH.
- 1999-2003 Stacey Fineran. Graduated 2003. Assessing spatial and temporal vegetative dynamics at Mentor Marsh, 1796 to 2000 A.D. Current Position: Assistant Professor of Professional Practice, SENR, The Ohio State University, Columbus, OH.
- 1998-2002 Erik Venteris. Graduated 2002. Spatial sampling, landscape modeling, and interpretation of soil organic carbon on zero-order watersheds. Current Position: Environmental Analytics Lead, Bayer, St. Louis, MO.

- Doctoral Students (Dissertation Committee Member)

- 2017-present Henry Peller
- 2012-2015 Maninder Walia. Graduated 2015.
- 2006-2009 Umakant Mishra. Graduated 2009.
- 2004-2007 Jianjun Hao. Graduated 2007.
- 1998-1999 Ricardo Lopez. Graduated 1999.
- 1997-1999 Quirine Ketterings. Graduated 1999.

- Doctoral Students (Candidacy Examination Committee Chair)

- 2019-present Shib Pattadar
- 2017-present Hengkang Zhao
- 2016-19 Omar Abdelmatloub
- 2015-18 Tania Burgos-Hernandez
- 2014-2016 Emma Kurth
- 2012-2014 Boniface Massawe
- 2007-2009 Rebecca Tirado-Corbala
- 2005-2008 Sakthi Subburayalu
- 1999-2002 Stacey Fineran
- 1999-2001 Gary Graham
- 1998-2001 Erik Venteris

- Doctoral Students (Candidacy Examination Committee Member)



2017-present Henry Peller  
2012-2015 Maninder Walia. Graduated 2015.  
2010-2011 Samuel Bolton. Graduated 2016.  
2004-2007 Jianjun Hao. Graduated 2007.  
1998-1999 Ricardo Lopez. Graduated 1999.

- Master's Students Plan A (Thesis Advisor)

2014-2016 David Tomashefski. Graduated 2016. An erodibility assessment of Central Ohio cropland soils. Current Position: Research Assistant, SENR, The Ohio State University, Columbus, OH.

2014-2016 Anne Vascik. Graduated 2016. Physiographic Mapping of Ohio's Soil Systems.

2014-2015 Olivia Smith. Graduated 2015. Effects Of Agricultural Land Conversion and Landscape Connectivity on Movement, Survival, and Abundance of Northern Bobwhites (*Colinus Virginianus*) In Ohio. Current Position: Graduate Research Assistant, Washington State University, Pullman, WA.

2013-2015 Tania Burgos-Hernandez. Graduated: 2015. Assessment of Effects of Long-Term Tillage Practices on Soil Properties in Ohio. Current Position. Graduate Fellow (SROP), The Ohio State University, Columbus, OH.

2012-2014 Emma Snyder. Graduated: 2014. Baseline Assessment of Dynamic Properties and Soil Resilience at Lawrence Woods State Nature Preserve. Current Position: Lecturer, Columbus State Community College, Columbus, OH.

2011-2013 Jared Shaffer. Graduated 2013. The effects of spatial resolution on digital soil attribute mapping. Current Position: Plant Health Inspector, Ohio Department of Agriculture, Columbus, OH.

2009-2011 Páll Kolka-Jonsson. Graduated: 2011. CarbBirch (Kolbjörk): Carbon sequestration and soil development under mountain birch (*Betula pubescens*) in rehabilitated areas in southern Iceland. Current Position: Vegagerðin, Icelandic Road and Coastal Administration, Reykjavik, Iceland.

2008-2010 Jenette Goodman. Graduated: 2010. Creating a Reliable and Transparent System for Updating Soil Based Yield and Productivity Data. Current Position: Engagement Manager, CiBO Technologies, Cambridge, MA.

2007-2009 Joseph Ringler. Graduated: 2009. Monitoring the hydrology of soils for on-site wastewater treatment systems using matric potential sensors. Current Position: Environmental Consultant, LJ Environmental LLC, Shelby, OH.

1999-2001 Pamm Kasper. Graduated 2001. Using fragmentation metrics to quantify changes in land use patterns. Current Position: Managing Editor, Alliance of Crop, Soil, and Environmental Science Societies (ACSESS), Madison, WI.

- Masters Student Plan B (MENR) Advisor

2016-2018 Haley Ingram. Graduated 2018

2013-2016 Kyle Kirker. Graduated 2016

2012-2013 Andrew Skunda. Graduated 2013

2011-2013 Kaitlin Hiller. Graduated 2013

2011-2012 Kimberly Allen. Graduated 2012

- Masters Student (Thesis Committee Member)

2018-present Thomas Doohan

2016-2018 Chloe Turner.

2017-2018 Yang Ding.

2015-2017 Kaitlyn Benson

2016-2017 Guannan Ding

2015-2016 Boniphace Nkombe

2014-2015 Claire Sutton

2013-2015 Yiming Zhao

2013-2014 Kylienne Clark

2012-2013 Nicholas Stanich

2011-2012 Brittany Campbell

2011-2012 Shaun Fontanella

2010-2011 Adam Kautza

2009-2011 Kristen Minca

2007-2009 Jason Undercoffer

2005-2007 Eli Hacker

2002-2004 Donald Burgess

2001-2002 Nicholas D'Amato

1999-2001 Dean Shields

1999-2001	Mehzabeen Hoosein
1999-2000	Steve Miller
1998-1999	Stacey Fineran
1997-1998	David Williams

- Masters Students (Examination Committee Member)

2018-2019	Casey Kowalewsky. Graduated 2019
2017-2018	Christopher Rupp. Graduated 2018
2017-2018	Colleen Sharkey. Graduated 2018
2017-2018	Margaret Hamer. Graduated 2018
2017-2018	Xinjue Ke. Graduated 2018
2016-2018	Christine Szymanski. Graduated 2018.
2016-2017	Alyssa Sexton. Graduated 2017
2016-2017	Daniel Giannamore. Graduated 2017
2016-2017	Emily Devon. Graduated 2017
2016-2017	Katy Tuckerman. Graduated 2017
2016-2017	Kori Goldberg Graduated 2017
2016-2017	Rosalie Hendon. Graduated 2017
2016-2017	Shayna Mohr. Graduated 2017
2016-2017	Tim Bachelor. Graduated 2017
2015-2018	Sumia Mohamed. Graduated 2018
2015-2016	Cassandra Loney. Graduated 2016
2015-2016	Claire Beck. Graduated 2016
2015-2016	Eric Metcalf. Graduated 2016
2015-2016	Eric Flood. Graduated 2016
2015-2016	Kurt Henry. Graduated 2016
2015-2016	Kyle Seitz. Graduated 2016
2015-2016	Sarah Barbee. Graduated 2016
2015-2016	Scott Goodfellow. Graduated 2016
2013-2014	Marci Lininger. Graduated 2014
2012-2016	Allan Hurtt. Graduated 2016.
2012-2014	Danielle Vent. Graduated 2014
2012-2014	Kathryne Rumora. Graduated 2014
2012-2013	Leah Wirgau. Graduated 2013
2001-2002	Brian Nartker. Graduated 2002

