# Dr. Matthew Goodwin Siebecker

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## Professional Positions

Assistant Professor, Texas Tech University. (January 2019 - Present).

Postdoctoral Researcher - Environmental Soil Chemistry, University of Delaware. (June 2016 - December 2019).

Postdoctoral Researcher - Chemical Oceanography, University of Delaware. (January 2014 - June 2016).

## Education

Ph D, University of Delaware, 2014.
Major: Environmental Soil Chemistry

BS, University of Massachusetts at Amherst, 2006.
Major: Environmental Science AND Plant and Soil Science

## Publications


1. Sparks, Donald L, Singh, Balwant, & Siebecker, M. G. (2023). Environmental Soil Chemistry, 3rd edition. In *Academic Press*. https://www.elsevier.com/books/environmental-soil-chemistry/sparks/978-0-12-815880-7.
2. Lago, B. C., Favarin, J. L., de Almeida, R. E. M., Pierozan Junior, C., de Oliveira, S. M., Tezotto, T., de Borja Reis, A. F., & Siebecker, M. G. (2023). Potassium application timing to improve corn K-fertilizer use in the oat-corn sequence: a tracer study for high yielding corn. *Journal of Plant Nutrition*, *46*(3), 618–629. https://doi.org/10.1080/01904167.2022.2067054
3. Guo, Wenxian, Wei Li, Siebecker, M. G., Mengqiang Zhu, Ling Li, & Donald L. Sparks. (2022). Coupling Molecular-Scale Spectroscopy with Stable Isotope Analyses to Investigate the Effect of Si on the Mechanisms of Zn–Al LDH Formation on Al Oxide. *Environmental Science Technology*, *56*(19), 13829–13836. https://doi.org/10.1021/acs.est.2c05140
4. Pham, Vung, Cynthia M. Jordan, David C. Weindorf, D. C. W., Matthew G. Siebecker, & Tommy Dang. (2022). iDVS: interactive 2D and 3D visualizations of proximal sensor data for rapid characterization of soil over large geographical areas. *Precision Agriculture*. Published. https://doi.org/10.1007/s11119-022-09962-8.
5. Pham, Thanh Quang, Aakriti Sharma, Katherine Coyle, Katie Lewis, & Matthew G. Siebecker. (2022). Metal (hydr)oxide surface precipitates and their effect on potassium sorption. *Environmental Science: Processes & Impacts*, *24*, 1037–1049. https://doi.org/10.1039/D2EM00092J.
6. Izaditame, F., Siebecker, M., & Sparks, D. L. (2022). Sea-level-rise-induced flooding drives arsenic release from coastal sediments. *Journal of Hazardous Materials*, *423*, 127161.
7. Riddle, R. L., Siebecker, M. G., Weindorf, D. C., Shaw, R. K., and Scharenbroch, B. C., 2022a, Chapter Four - Soils in urban and built environments: Pedogenic processes, characteristics, mapping, and classification, in Sparks, D. L., ed., Advances in Agronomy, Volume 173, Academic Press, p. 227-255.
8. Szerlag, Kathryn, Elavarthi, Monica, Siebecker, Matthew G, Gu, Chunhao, McCrone, Conner, & Sparks, Donald. (2022). Systematic Study of Legacy Phosphorus (P) Desorption Mechanisms in High-P Agricultural Soils. *Minerals*, *12*(4), 458. https://doi.org/10.3390/min12040458.

9. Yan, Jiali, Zhong Tang, Matthew Fischel, Peng Wang, Siebecker, M. G., Mark G. M. Aarts, Donald L. Sparks, & Fang-Jie Zhao. (2022). Variation in cadmium accumulation and speciation within the same population of the hyperaccumulator Noccaea caerulescens grown in a moderately contaminated soil. *Plant and Soil*, *475*, 379–394. https://doi.org/10.1007/s11104-022-05373-w

10. Schmidt, E. J., Zanoni, G., Bumguardner, A., Segvic, B., Lewis, K., Abdala, D., & Siebecker, M. (2022). Soil chemical extractions can alter potassium coordination in agricultural soils: A combined wet chemical and X-ray absorption spectroscopic approach. *Geoderma*.

11. Davis, E.M., Y. Liang, K.P. Wallace, A. Zimmerman, M.G. Siebecker, P.R. Broadway, J.A. Carroll, & M.A. Ballou. (2022). A porous ceramic particle with or without a preservative did not impair apparent digestibility of macro- and micro-nutrients of post-weaned pigs. *Translational Animal Science*, *6*(3). https://doi.org/10.1093/tas/txac078.

12. Zimmerman, A. J., Gutierrez, D. G., Campos, V. M., Weindorf, D., Deb, S., Chacón, S. U., Landrot, G., Flores, N. G. G., & Siebecker, M. (2021). Arsenic speciation in titanium dioxide (TiO2) waste produced via drinking water filtration: Potential environmental implications for soils, sediments, and human health. *Environmental Advances*, *3*, 100036.

13. Wang, H., Hu, W., Wu, Q., Huang, B., Li Zong, Wang, A., & Siebecker, M. (2021). Effectiveness evaluation of environmentally friendly stabilizers on remediation of Cd and Pb in agricultural soils by multi-scale experiments. *Journal of Cleaner Production*, *311*, 127673.

14. Mo, X., Siebecker, M., Gou, W., & Li, W. (2021). EXAFS investigation of Ni(Ⅱ) sorption at the palygorskite-solution interface: New insights into surface-induced precipitation phenomena. *Geochimica Et Cosmochimica Acta*, *314*, 85–107.

15. Mo, X., Siebecker, M., Gou, W., Li, L., & Li, W. (2021). A review of cadmium sorption mechanisms on soil mineral surfaces revealed from synchrotron-based X-ray absorption fine structure spectroscopy: Implications for soil remediation. *Pedosphere*, *31*(1), 11–27.

16. Yan, J., Fischel, M., Chen, H., Siebecker, M., Wang, P., Zhao, F., & Sparks, D. L. (2021). Cadmium speciation and release kinetics in a paddy soil as affected by soil amendments and flooding-draining cycle. *Environmental Pollution*, *268*, 115944.

17. Lopes, G., Li, W., Siebecker, M., Sparks, D. L., & Guimaraes Guilherme, Luiz Roberto. (2021). Combining zinc desorption with EXAFS speciation analysis to understand Zn mobility in mining and smelting affected soils in Minas Gerais, Brazil. *Science of the Total Environment*, *754*.

18. Li, J., Wang, Y., Xue, X., Xie, X., Siebecker, M. G., Sparks, D. L., & Wang, Y. (2020). Mechanistic insights into iodine enrichment in groundwater during the transformation of iron minerals in aquifer sediments. *Science of the Total Environment*. p. 140922.

19. Giannetta, G., Siebecker, M. G., Zaccone, C., Plaza, C., Rovira, P., Vischetti, C., & Sparks, D. L. (2020). Iron(III) fate after complexation with soil organic matter in fine silt and clay fractions: An EXAFS spectroscopic approach. *Soil and Tillage Research*, *200, 104617*.

20. Giannetta, B., Plaza, C., Siebecker, M. G., Aquilanti, G., Vischetti, C., Plaisier, J. R., Juanco, M., Sparks, D. L., and Zaccone, C., 2020, Iron Speciation in Organic Matter Fractions Isolated from Soils Amended with Biochar and Organic Fertilizers: Environmental Science & Technology, v. 54, no. 8, p. 5093-5101.

21. Sun, Q., Liu, C., Cui, P., Fan, T., Zhu, M., Alves, M. E., Siebecker, M., Sparks, D. L., Wu, T., Li, W., Zhou, D., & Wang, Y. (2019). Formation of Cd precipitates on gamma-Al2O3: Implications for Cd sequestration in the environment. *Environment International*, *126*, 234–241.

22. Giannetta, B., Zaccone, C., Plaza, C., Siebecker, M., Rovira, P., Vischetti, C., & Sparks, D. L. (2019). The role of Fe(III) in soil organic matter stabilization in two size fractions having opposite features. *Science of the Total Environment*, *653*, 667–674.

23. Oldham, V. E., Siebecker, M., Jones, M. R., Mucci, A., Tebo, B. M., & Luther, George W., III. (2019). The Speciation and Mobility of Mn and Fe in Estuarine Sediments. *Aquatic Geochemistry*, *25*(1-2), 3–26. Impact Factor 1.6.

24. Gou, W., Siebecker, M., Wang, Z., & Li, W. (2018). Competitive sorption of Ni and Zn at the aluminum oxide/water interface: an XAFS study. *Geochemical Transactions*, *19*.

25. Siebecker, M., Chaney, R. L., & Sparks, D. L. (2018). Natural speciation of nickel at the micrometer scale in serpentine (ultramafic) topsoils using microfocused X-ray fluorescence, diffraction, and absorption. *Geochemical Transactions*, *19*.

26. Siebecker, M., Li, W., & Sparks, D. L. (2018). The Important Role of Layered Double Hydroxides in Soil Chemical Processes and Remediation: What We Have Learned Over the Past 20 Years. In *Advances in Agronomy: Vol. 147* (pp. 1–59).

27. Siebecker, M., Chaney, R. L., & Sparks, D. L. (2017). Nickel speciation in several serpentine (ultramafic) topsoils via bulk synchrotron-based techniques. *Geoderma*, *298*, 35–45.

28. Siebecker, M., & Sparks, D. L. (2017). Structural Differentiation between Layered Single (Ni) and Double Metal Hydroxides (Ni-Al LDHs) Using Wavelet Transformation. *The Journal of Physical Chemistry a*, *121*(37), 6992–6999.

29. Olson, L., Quinn, K. A., Siebecker, M., Luther, George W., III, Hastings, D., & Morford, J. L. (2017). Trace metal diagenesis in sulfidic sediments: Insights from Chesapeake Bay. *Chemical Geology*, *452*, 47–59.

30. Siebecker, M., Madison, A. S., & Luther, George W., III. (2015). Reduction Kinetics of Polymeric (Soluble) Manganese (IV) Oxide (MnO2) by Ferrous Iron (Fe2+). *Aquatic Geochemistry*, *21*(2-4), 143–158.

31. Siebecker, M., Li, W., Khalid, S., & Sparks, D. (2014). Real-time QEXAFS spectroscopy measures rapid precipitate formation at the mineral-water interface. *Nature Communications*, *5*. Impact Factor 11.4.

32. Li, W., Livi, Kenneth J. T., Xu, W., Siebecker, M., Wang, Y., Phillips, B. L., & Sparks, D. L. (2012). Formation of Crystalline Zn-Al Layered Double Hydroxide Precipitates on gamma-Alumina: The Role of Mineral Dissolution. *Environmental Science & Technology*, *46*(21), 11670–11677.

33. Centofanti, T., Siebecker, M., Chaney, R. L., Davis, A. P., & Sparks, D. L. (2012). Hyperaccumulation of nickel by Alyssum corsicum is related to solubility of Ni mineral species. *Plant and Soil*, *359*(1-2), 71–83.

## Manuscript in Preparation (close to finalized or currently under review)

1. Zimmerman, Amanda Jo, Danira Garcia Gutierrez, Negar Shaghaghi, Aakriti Sharma, Amrika Deonarine, Gautier Landrot, David Weindorf, & Matthew G. Siebecker. (2023). Competitive desorption and bioaccessibility of arsenic (As) bound to titanium dioxide (TiO2) water treatment residuals (WTRs). *Environmental Pollution (under Review 2023)*. Working Paper.

2. Pham, Thanh, Scott Longing, & Matthew G. Siebecker. (2023). Consumption and degradation of different consumer plastics by mealworms (Coleoptera: Tenebrionidae): Effects of plastic type, time, and mealworm origin. *Journal of Cleaner Production (under Review 2023)*. Working Paper.

3. Montero, Virginia, Oscar Ulloa, Matthew G. Siebecker, Amanda Jo Zimmerman, David C. Weindorf, Marcela Quirós, Sharon Ulate, & Javier Estrada. (2023). Establishing a scenario of exposure to environmental toxins associated with nephropathies in agricultural areas of Costa Rica based on Geological Medicine. *(In Preparation 2023)*. Working Paper. Contributions from Siebecker: translation, instrumentation resources, writing - original draft preparation, writing - review and editing.

4. Cognasi, S., Siebecker, M., Williams, C., & Simpson, C. (2023). Influence of Selenium and Salt Stress on Plant Growth and Physiology in Hydroponically Produced Indian Mustard. *(In Preparation 2023)*. Working Paper.

5. Salimi, Sara, Mahsa Rezaei, Reyhaneh Varshochian, Matthew G. Siebecker, Rasoul Dinarvand, & Alireza Abbasi. (2023). Modified nano HKUST-1: stabilization in aqueous medium intended for breast cancer therapy. *(In Preparation 2023)*. Working Paper. Contributions from Siebecker: data analysis, writing - original draft preparation, writing - review and editing.

6. Venkataramani, S., Kafle, A., Singh, M., Singh, S., Simpson, C., & Siebecker, M. (2023). Greenhouse cultivation of cucumber (Cucumis sativus) in soilless media amended with biochar and compost. *Scientia Horticulturae (In Preparation 2023)*. Working Paper.

## Presentations and Lectures

1. Siebecker, M.G., Texas State Support Committee Meeting, "Rapid formation of surface precipitates as a novel explanation for excessive potassium fixation in agricultural soils," Lubbock, TX. (2022).
2. Schmidt, Emma, Giovanni Zanoni, Amee Bumguardner, Branimir Segvic, Katie L. Lewis, Dalton Belchior Abdala, Siebecker, M. G., ASA, CSSA, SSSA International Annual Meeting, "Alteration of Potassium Coordination in Agricultural Soils Due to Wet Chemical Extractions," Baltimore, MD, USA. (November 2022).
3. Zimmerman, Amanda Jo, Danira Garcia-Gutierrez, Aakriti Sharma, Negar Shaghaghi, Amrika Deonarine, Gautier Landrot, Siebecker, M. G., ASA, CSSA, SSSA International Annual Meeting, "Competitive Desorption and Potential Bioaccessibility of Arsenic (As) Released from Nanoparticulate Titanium Dioxide (TiO2)," Baltimore, MD, USA. (November 2022).
4. Sharma, Aakriti, Katherine Coyle, Thanh Pham, Katie L. Lewis, Siebecker, M. G., ASA, CSSA, SSSA International Annual Meeting, "Role of Co-Ions, Dissolved Silicate, and Surface Precipitation in Potassium Sorption to Soil Clay Minerals," Baltimore, MD, USA. (November 2022).
5. Nunes, Marcio Felipe Pinheiro Neri, Guilherme Lopes, Gabryel Silva Martins, Mateus Belisario de Assis, Leônidas Canuto do Santos, Guilherme Augusto Mendes da Silva, Siebecker, M. G., ASA, CSSA, SSSA International Annual Meeting, "Sweet Potato Biofortification with Selenium-Enriched Urea and MAP Granules," Baltimore, MD, USA. (November 2022).
6. Szerlag, Kathryn Daria, Monica Elavarthi, Siebecker, M. G., Chunhao Gu, Conner McCrone, Donald L. Sparks, ASA, CSSA, SSSA International Annual Meeting, "Systematic Study of Legacy Phosphorus (P) Desorption Mechanisms in High-P Agricultural Soils," Baltimore, MD, USA. (November 2022).
7. Cognasi, S. (Presenter & Author), Siebecker, M. (Author Only), Williams, C. (Author Only), Simpson, C. (Chair), American Society of Horticultural Sciences annual meeting, "The influence of selenium on salt stress in hydroponically produced Indian mustard (Brassica juncea cv. Red Giant)," ASHS, Chicago, Il. (July 2022).
8. Gutierrez, Danira Garcia, Amanda Jo Zimmerman, Matthew G. Siebecker, Department of Plant and Soil Science Research Symposium (Texas Tech University), "Exploring the Physicochemical Properties of Arsenic in Water Filtration Waste from Northwestern Costa Rica." (April 2022).
9. Morgan Forbes, Noah R. Harrell, Madison Hernandez, Carson Payton, Tana Pierce, Sadie Sherburn, Koy Stanley, Jessica Colvin, Aakriti Sharma, Matthew G. Siebecker, Department of Plant and Soil Science Research Symposium (Texas Tech University), "How Environmental Conditions Affect Nutrient Availability in Soils Treated with Swine Waste." (April 2022).
10. Betts, Aaron, Sowers, Tyler, Siebecker, M., Wang, Jia, Elzinga, Evert, Luxton, Todd, Thompson, Aaron, Sparks, Donald, Geological Society of America, 56th Annual North-Central/71st Annual Southeastern Section Meeting, "Electron transfer and dissolution of clay minerals influence green rust precipitation at iron-reducing conditions," Cincinnati, OH. (April 2022).
11. Coyle, Katherine, Aakriti Sharma, Thanh Pham, D., Katie Lewis, Siebecker, M. G., Texas Tech University Undergraduate Research Conference, "Potassium Adsorption to Al(OH)3 and SiO2 in the Presence of Co-ions." (March 2022).
12. Pham, Thanh, D., Aakriti Sharma, Katherine Coyle, Katie Lewis, Siebecker, M. G., Texas Tech University Undergraduate Research Conference, "Potassium binding ability to newly formed mineral precipitates." (March 2022).
13. Cognasi, S. (Presenter & Author), Siebecker, M. (Author Only), Williams, C. (Author Only), Simpson, C. (Chair), Southern Region American Society for Horticultural Sciences Annual Conference, "Effects of Se on growth and physiochemical properties in hydroponically produced Indian Mustard," Southern Region American Society for Horticultural Sciences, New Orleans. (February 12, 2022).
14. Cognasi, S. (Presenter & Author), Siebecker, M. (Author Only), Williams, C. (Author Only), Simpson, C. (Chair), Lone Star Horticulture Forum, "Influence of Se supplementation on Indian mustard grown in a hydroponic system," TNLA, College Station, TX. (January 10, 2022).

15. Siebecker, M., ASA, CSSA, SSSA International Annual Meeting, "Potassium, Revisited: New Insights Based on XAS into the Effects of Soil Extractions on K Speciation and the Adsorption of K Onto Al and Si Oxides," Salt Lake City, UT. (2021).
16. BrijalbaUG, K. E., Siebecker§, M. G., ASA, CSSA, SSSA International Annual Meeting, "Reduction Kinetics of Nanoparticulate Manganese Oxides Via Dissolved Organic Carbon Sources," Salt Lake City, UT. (2021).
17. Singh, M. (Presenter & Author), Singh, S. (Chair), Deb, S. (Author Only), Parkash, V. (Author Only), Petermann, B. J. (Author Only), Siebecker, M. (Author Only), ASA-CSSA-SSSA international annual meeetings, "Effect of biochar application on soil properties and sweet corn performance under deficit irrigation," ASA-CSSA-SSSA, Salt Lake City, UT. (2021).
18. Zimmerman, A. (Presenter & Author), Garcia-Gutierrez, D. (Author Only), Deb, S. (Author Only), Landrot, G. (Author Only), Siebecker, M. (Chair), ASA-CSSA-SSSA international annual meeetings, "Extraction and bioavailability of arsenic from titanium dioxide filter waste," ASA-CSSA-SSSA, Salt Lake City, UT. (2021).
19. SchmidtMS, Emma, Siebecker, M. G., Soil Survey And Land Resource Workshop, "Revisiting Potassium Chemistry in Soils via Combined Extractions and Synchrotron Techniques," Texas; Texas A&M University. (2021).
20. Siebecker, M.G., Texas State Support Committee Meeting, "A Kinetics clay Mineralogical Approach to Understand Excessive Potassium Sorption and Fixation to Soil Clay and Metal Oxide Minerals in Agricultural Soils," Lubbock, TX. (2021).
21. Szerlag, Kathryn Daria, Paul Northrup, Ryan Tappero, Matthew G. Siebecker, Donald L. Sparks, Soil Science Society of America, "Advances in the Use of Synchrotron-Based Spatially Resolved Imaging and Spectroscopy to Speciate Phosphorus in Soils," Salt Lake City, UT. (November 2021).
22. ZimmermanPHD, Amanda Jo, Danira Garcia-GutierrezUG, Sanjit K Deb, Gautier Landrot, Matthew G. Siebecker, Soil Science Society of America, "Extraction and Bioavailability of Arsenic from Titanium Dioxide Filter Waste," Salt Lake City, UT. (November 2021).
23. Izaditame, Fatemeh, Matthew G. Siebecker, Donald L. Sparks, Soil Science Society of America, "How Does Sea-Level Rise Impact Pollution Release in Contaminated Coasts?," Salt Lake City, UT. (November 2021).
24. Li, Wei, Matthew G. Siebecker, Donald L. Sparks, Soil Science Society of America, "In-Situ Qexafs Sheds Light on the Mechanisms of Surface Induced LDH Precipitates at Mineral/Water Interface," Salt Lake City, UT. (November 2021).
25. JordanMS, Cynthia Marie, Vung Pham, Tommy Dang, David C. Weindorf, Matthew G. Siebecker, Soil Science Society of America, "Novel Soil Core Data Visualization of Diagnostic Soil Feature Pedogenesis," Salt Lake City, UT. (November 2021).
26. CoyleUG, Katherine, Thanh PhamUG, Aakriti SharmaPDS, Matthew G. Siebecker, Soil Science Society of America, "Potassium Adsorption to Si and Al Oxides in the Presence of Ni, Zn, and Mg," Salt Lake City, UT. (November 2021).
27. PhamUG, Thanh, Katherine CoyleUG, Aakriti SharmaPDS, Matthew G. Siebecker, Soil Science Society of America, "Potassium Binding Ability to Newly Formed Mineral Precipitates," Salt Lake City, UT. (November 2021).
28. Shaik, A. (Presenter & Author), Singh, S. (Chair), Siebecker, M. (Author Only), Wallace, R. (Author Only), ASHS Annual Conference, "Yield and nutrient content of eggplant as influenced by arbuscular mycorrhizal fungi in organic soilless production system," American Society for Horticultural Science, Denver, Colorado. (August 2021).
29. Ulate Chacón, S., Montero Campos, V., Ardon-Dryer, K., Siebecker, M., Zimmerman, A. J., Technologico de Costa Rica, "Quantification of heavy metals in PM 10 PM 2 5 and PM 1 atmospheric particles and their relationship with the prevalence of Mesoamerican Nephropathy in the canton of Cañas Guanacaste, Costa Rica," Technologico de Costa Rica, Cartago Costa Rica. (June 16, 2021).

30. Izaditame, F., Siebecker, M. G., Sparks, D., American Chemical Society, "Elemental cycling from contaminated coastal sediments subjected to varying sea-level rise induced flooding intensities." (April 2021).

31. BrijalbaUG, K., Siebecker, M. G., American Chemical Society, "Experimental redox kinetics of nanoparticulate manganese oxide (MnO2) and dissolved organic carbon: UV-Vis study." (April 2021).

32. Hicks, Lauren E., Joseph M. Barcus, Kaitlyn M. Goree, Noah R. Harrell, Alivia R. Mayfield, Christylee Deblieck, Jeffrey Martin, Britt Canada, Jessica Colvin, Emma SchmidtMS, Cynthia JordanMS, Matthew G. Siebecker, Department of Plant and Soil Science Research Symposium (Texas Tech University), "Impacts of swine waste application and subsequent inundations on nutrient and trace metal concentration and mobility in agricultural field soils." (April 2021).

33. BrijalbaUG, K., Siebecker, M. G., Texas Tech University Undergraduate Research Conference, "Redox Kinetics of Nanoparticulate Manganese Oxide (MnO2) and Dissolved Organic Carbon: A UV-Vis Study." (March 2021).

34. Garcia GutierrezUG, D., Siebecker, M., Texas Tech University Undergraduate Research Conference, "Understanding the mobility, speciation, and effects of arsenic in filtrate waste in rural soils." (March 2021).

35. ZimmermanPHD, A. J., Garcia-GutierrezUG, D., Weindorf, D. C., Montero-Campos, V., Deb, S. K., Ulate-Chacón, S., Landrot, G., Siebecker, M. G., Soil Science Society of America International Meetings, "Arsenic Geochemistry in Titanium Dioxide (TiO2) Drinking Water Filter Waste and Impacted Soils: Implications for Urban Environmental and Human Health," Virtual. (November 2020).

36. Mo, X., Siebecker, M. G., Li, W., Soil Science Society of America International Meetings, "New Insights into the Mechanism on Surface Induced Ni Precipitation at the Clay-Solution Interface: A Structure-Reactivity Perspective," Virtual. (November 2020).

37. SchmidtMS, E., Zanoni, G., Lewis, K., Segvic, B., Siebecker, M., Soil Science Society of America International Meetings, "Pairing Sequential Extractions and x-Ray Absorption Spectroscopy to Analyze Potassium Fixation in Agricultural Soils," Virtual. (November 2020).

38. BrijalbaUG, K., Siebecker, M., Texas Tech University - Undergraduate Research Conference, "An Investigation Into The Reduction Kinetics Of Nanoparticulate Manganese Oxides Via Dissolved Organic Carbon Sources," Texas Tech University. (March 31, 2020).

39. Garcia-GutierrezUG, D., ZimmermanPHD, A. J., Siebecker, M., Texas Tech University - Undergraduate Research Conference, "Determining Arsenic Mobility And Speciation: An Analysis Of Soil Contaminated By Water Filtration Techniques In Costa Rica," Texas Tech University. (March 31, 2020).

40. Szerlag, K. D., Izaditame, F., Northrup, P., Siebecker, M. G., Tappero, R., Jaisi, D., Sparks, D. L., American Chemical Society, "Speciation of legacy P in soils using multi-modal μ-XRF mapping and μ-XANES," Philadelphia, PA. (March 25, 2020).

41. ZimmermanPHD, A. J., Siebecker, M. G., Weindorf, D. C., Montero Campos, V., Deb, S. K., Ulate Chacón, S., Landrot, G., American Chemical Society, "Speciation, quantification, and release of arsenic bound to titanium dioxide (TiO2, anatase) drinking water filter waste: a case study from the field to molecular scale," Philadelphia, PA. (March 24, 2020).

42. Izaditame, F., Siebecker, M. G., Tappero, R., Sricharoenvech, P., Sparks, D. L., American Chemical Society, "Arsenic fate under the shadow of sea-level rise," Philadelphia, PA. (March 23, 2020).

43. Sanchez, J., Stuckey, J., Tappero, R., Siebecker, M. G., Sparks, D. L., American Chemical Society, "Sea level rise impacts on arsenic mobility in natural systems," Philadelphia, PA. (March 23, 2020).

44. Izaditame, F., Siebecker, M. G., Tappero, R., Sricharoenvech, P., Sparks, D. L., American Geophysical Union, "How Does Sea-Level-Rise Affect the Release of Pollutants from Flood-Prone Contaminated Coastal Sediments?," San Francisco, California, USA. (December 11, 2019).

45. Sricharoenvech, P., Sparks, D. L., Tappero, R., Landrot, G., Siebecker, M., Soil Science Society of America International Meetings, "Desorption of Chromium from Contaminated Urban Soils," San Antonio, TX. (November 2019).

46. Izaditame, F., Siebecker, M., Sparks, D. L., Soil Science Society of America International Meetings, "Sea-Level-Rise-Induced Release of Heavy Metals from Flood-Prone Contaminated Coastal Sediments," San Antonio, TX. (November 2019).

47. Siebecker, M. (Presenter & Author), Zimmerman, A.J. (Author Only), Weindorf, D. (Author Only), Campos, V.M. (Author Only), Deb, S. (Author Only), Chacon, S.U. (Author Only), Landrot, G. (Author Only), The 2019 American Society of Agronomy, Crop Science Society of America, and Soil Science Society of America Annual Meeting, "Quantification and mobility of arsenic from sediments and soils enriched with titanium dioxide (TiO2) drinking water filter waste," San Antonio, TX. (November 2019).

48. Siebecker, M., Zimmerman, A.J., Weindorf, D., Campos, V.M., Deb, S., Chacon, S.U., Landrot, G., Soil Science Society of America International Meetings, "Quantification and mobility of arsenic from sediments and soils enriched with titanium dioxide (TiO2) drinking water filter waste," San Antonio, TX. (November 11, 2019).

49. Siebecker, M., TTU PSS Departmental Seminar Series, "Abiotic and biotic responses to a changing climate," Lubbock, Texas. (October 24, 2019).

50. Siebecker, M., Project Revolution at the HUB, "Environmental Soil Chemistry at TTU," Lubbock, Texas. (October 15, 2019).

51. Szerlag, K., Northrup, P., Tappero, R., Siebecker, M. G., Jaisi, D., Sparks, D., Goldschmidt, "Direct Detection of Solid-Phase Phosphorus Speciation in Agricultural Soils Using Paired μ-XRF Mapping and μ-XANES," Barcelona, Spain. (August 21, 2019).

52. Mo, X., Siebecker, M. G., Gou, W., Li, W., Goldschmidt, "Surface Induced Ni(Ⅱ) Precipitation at the Palygorskite-Solution Interface Revealed by EXAFS, HRTEM, and DRS," Barcelona, Spain. (August 21, 2019).

53. Li, J., Xie, X.J., Siebecker, M. G., Sparks, D. L., 15th International Conference on the Biogeochemistry of Trace Elements (ICOBTE), "Iodine release associated with the transformation of iron minerals in natural sediments," Nanjing, China. (May 6, 2019).

54. Mo, X., Siebecker, M. G., Guo, W., Li, W., 15th International Conference on the Biogeochemistry of Trace Elements (ICOBTE), "Mechanisms of Ni(II) sorption at the palygorskite-solution interface revealed from EXAFS, HRTEM and DRS investigation," Nanjing, China. (May 6, 2019).

55. Betts, A., Siebecker, M. G., Scheckel, K., Sparks, D. L., Soil Science Society of America International Annual Meeting, "Electron Transfer and Clay Dissolution Affect Precipitation of Fe Mixed-Valence Hydroxides during Fe(II) Sorption to Natural Clay," American Society of Agronomy, Crop Science Society of America, Soil Science Society of America, San Diego, California, USA. (January 2019).

56. Siebecker, M. G., Chaney, R. L., Sparks, D. L., Soil Science Society of America International Annual Meeting, "Natural Speciation of Trace Metal Rich Soil Minerals at the Micrometer Scale Using Microfocused X-Ray Fluorescence, Diffraction, and Absorption," American Society of Agronomy, Crop Science Society of America, Soil Science Society of America, San Diego, California, USA. (January 2019).

57. Giannetta, B., Siebecker, M. G., Zaccone, C., Plaza, C., Aquilanti, G., Vischetti, C., Sparks, D. L., Soil Science Society of America International Annual Meeting, "The Role of Fe Species in SOM Stabilization in Agricultural Soils Subjected to Biochar and Organic Fertilizer Amendments," American Society of Agronomy, Crop Science Society of America, Soil Science Society of America, San Diego, California, USA. (January 2019).

58. Szerlag, K., Northrup, P., Tappero, R., Siebecker, M. G., Jaisi, D., Sparks, D. L., Soil Science Society of America International Annual Meeting, "The Solid Phase Speciation of Legacy Phosphorus in US Mid-Atlantic Agricultural Soils Using Micro-XRF Mapping and Micro-XANES," American Society of Agronomy, Crop Science Society of America, Soil Science Society of America, San Diego, California, USA. (January 2019).

59. Giannetta, B., Siebecker, M., Zaccone, C., Plaza, C., Aquilanti, G., Vischetti, C., Sparks, D. L., American Geophysical Union, "Soil Organic Matter-Mineral interactions across pools in different land uses: the

importance of Fe mineral dynamics in natural environments," American Geophysical Union, Washington, D.C., USA. (December 13, 2018).

60. Giannetta, B., Zaccone, C., Plaza, C., Siebecker, M., Aquilanti, G., Czyzychi, M., Vischetti, C., Sparks, D. L., XXXVI Convegno Nazionale Società Italiana di Chimica Agraria (SICA), "A spectroscopic approach to Fe speciation in SOM pools under agricultural soils subjected to biochar and organic fertilizers," Dipartimento di Agraria, Università Mediterranea, Italy. (September 2018).
61. Szerlag, K., Siebecker, M., Jaisi, D., Northrup, P., Sparks, D. L., 21st World Congress of Soil Science, "The chemistry of legacy phosphorus in US Mid-Atlantic agricultural soils," International Union of Soil Science, Rio de Janeiro, Brazil. (August 2018).
62. Betts, A., Siebecker, M., Sparks, D. L., 55th Annual Meeting of the Clay Minerals Society, "Oxidation status of subsoil clay during Fe(II) sorption alters the composition of precipitated Fe(II)-bearing layered double hydroxides," University of Illinois at Urbana-Champaign, Champaign, Illinois, USA. (June 2018).
63. Szerlag, K. D., Northrup, P., Siebecker, M. G., Jaisi, D., Sparks, D. L., The National Synchrotron Light Source II (NSLS-II) and Center for Functional Nanomaterials (CFN) Users' Meeting, "Legacy phosphorus speciation in US Mid-Atlantic agricultural soils using tender energy X-ray absorption spectroscopy (TES)," Brookhaven National Laboratory, New York, USA. (May 2018).
64. Giannetta, B., Plaza, C., Zaccone, C., Siebecker, M. G., Rovira, P., Vischetti, C., Sparks, D. L., European Geosciences Union General Assembly, "Fe(III) fate after complexation with different soil organic matter fractions: retention capacity and mechanisms," Vienna, Austria. (April 2018).
65. Giannetta, B., Siebecker, M. G., Plaza, C., Zaccone, C., Rovira, P., Vischetti, C., Sparks, D. L., European Geosciences Union General Assembly, "Impact and reactivity of Fe(III)-OM complexes and Fe(III) polymerization in SOM fractions under different land uses," Vienna, Austria. (April 2018).
66. Giannetta, B., Zaccone, C., Plaza, C., Siebecker, M. G., Rovira, P., Vischetti, C., Sparks, D. L., European Geosciences Union General Assembly, "Soil organic matter-mineral interactions across different land uses: the importance of Fe-mediated stabilization," Vienna, Austria. (April 2018).
67. Szerlag, K., Siebecker, M. G., Jaisi, D., Northrup, P., Sparks, D. L., University of Delaware College of Agriculture and Natural Resources Research Symposium, "The chemistry of legacy phosphorus in US Mid-Atlantic agricultural soils," Newark, Delaware, USA. (April 2018).
68. Betts, A., Starcher, A., Siebecker, M., Elzinga, E., Sparks, D. L., Delaware Environmental Institute Annual Conference, "Precipitation of a Fe(II)-Al(III) layered double hydroxide (LDH) in an anaerobic soil clay fraction," Delaware Environmental Institute and University of Delaware, Newark, Delaware, USA. (2017).
69. Giannetta, B., Plaza, C., Zaccone, C., Siebecker, M. G., Rovira, P., Vischetti, C., Sparks, D. L., American Geophysical Union, "Impact of Fe(III)-OM complexes and Fe(III) polymerization on SOM pools reactivity under different land uses," American Geophysical Union, New Orleans, Louisiana, USA. (December 14, 2017).
70. Giannetta, B., Zaccone, C., Plaza, C., Siebecker, M. G., Vischetti, C., Sparks, D. L., XXXV Convegno Nazionale Società Italiana di Chimica Agraria (SICA), "Fe(III) fate after complexation with SOM pools under different land uses," Udine, Italy. (September 2017).
71. Siebecker, M. G., Sparks, D. L., American Chemical Society National Meeting, "Structural insights on Ni-Al LDHs using wavelet analysis," American Chemical Society, San Francisco, California, USA. (April 2017).
72. Chan, C., McAllister, S., Field, E., Chiu, B., Hoppes, K., Siebecker, M. G., Luther, G., Goldschmidt, "How do Fe-Oxidizing Microbes Influence Biogeochemical Cycles? Perspectives from Kinetics and Metagenomics/Transcriptomics," Yokohama, Japan. (June 2016).
73. Li, W., Siebecker, M., Sparks, D., Goldschmidt, "Probing the Rapid Formation Kinetics of Ni-Al LDH Precipitates on γ-Alumina Using QEXAFS," Yokohama, Japan. (June 2016).
74. Oldham, V., Jones, M. R., Siebecker, M. G., Tebo, B. M., Mucci, A., Luther, G. W., Gordon Research Conference in Chemical Oceanography, "The cycling of Mn(III)-L in the suboxic porewaters and

overlying oxic waters of the St. Lawrence Estuary, Québec, Canada," Holderness, New Hampshire, USA. (July 2015).

75. Siebecker, M. G., Madison, A. S., Luther, G. W., American Chemical Society National Meeting, "Reduction kinetics of polymeric (soluble) manganese(IV) oxide (MnO2) by ferrous iron (Fe2+)," American Chemical Society, Denver, Colorado, USA. (March 2015).
76. Li, W., Siebecker, M. G., Sparks, D. L., American Chemical Society National Meeting, "Tackling rapid reaction kinetics at the mineral- water interface using quick-scanning X-ray absorption spectroscopy," American Chemical Society, Denver, Colorado, USA. (March 2015).
77. Oldham, V., Jones, M. R., Siebecker, M. G., Tebo, B. M., Mucci, A., Luther, G. W., American Chemical Society National Meeting, "The source of Mn3+L in the surface waters of the Saguenay Fjord, Québec, Canada," American Chemical Society, Denver, Colorado, USA. (March 2015).
78. Li, W., Siebecker, M. G., Sparks, D. L., Soil Science Society of America International Annual Meeting, "Kinetics of Ni-Al layer double hydroxide precipitate formation on aluminum oxide: A time-resolved XRD and quick-scanning EXAFS study," American Society of Agronomy, Crop Science Society of America, Soil Science Society of America, Tampa, Florida, USA. (November 2013).
79. Siebecker, M. G., Li, W., Khalid, S., Sparks, D. L., 5th Department of Plant and Soil Sciences Symposium, "Rapid formation of nickel rich precipitates on clay minerals revealed by Q-EXAFS spectroscopy," University of Delaware and Longwood Gardens, Longwood Gardens, Kennett Square, Pennsylvania. (May 2013).
80. Siebecker, M., Li, W., Khalid, S., Sparks, D. L., University of Delaware Annual Graduate Student Forum, "Real time transition metal precipitation on clay minerals," University of Delaware, Newark, Delaware. (May 2013).
81. Siebecker, M., Li, W., Khalid, S., Sparks, D. L., American Chemical Society National Meeting, "Real-time sorption and precipitation of nickel on clay minerals: An in situ quick-EXAFS investigation," New Orleans, Louisiana, USA. (April 2013).
82. Siebecker, M., Li, W., Khalid, S., Sparks, D. L., Soil Science Society of America International Annual Meeting, "An in situ real-time quick X-ray absorption spectroscopic (Q-XAS) investigation of Ni precipitation on Al-rich soil minerals," American Society of Agronomy, Crop Science Society of America, Soil Science Society of America, San Antonio, Texas, USA. (October 2011).
83. Siebecker, M., Chaney, R. L., Sparks, D. L., Plant and Soil Sciences Graduate Research Symposium, "Elucidating nickel distribution in serpentine soils using μ-SXRF and μ-SXRD," University of Delaware, Newark, Delaware, USA. (April 2010).
84. Centofanti, T., Siebecker, M., Chaney, R. L., Sparks, D. L., International Phytotechnology Conference, "Phytoavailability of Ni compounds to Alyssum species," International Phytotechnology Society, St. Louis, Missouri, USA. (December 2009).
85. Siebecker, M. G., Centofanti, T., Chaney, R. L., Sparks, D. L., Soil Science Society of America International Annual Meeting, "Geogenic nickel speciation in serpentine soils and its relationship to nickel uptake in hyperaccumulator plants," American Society of Agronomy, Crop Science Society of America, Soil Science Society of America, Pittsburgh, Pennsylvania, USA. (November 2009).
86. Siebecker, M. G., Paulose, B., Lanza, G., Parkash, O., 12th Annual Massachusetts Statewide Undergraduate Research Conference, "Phytoremediation potential for Crambe plant (Crambe abyssinica) of heavy metal contaminated soil," University of Massachusetts, Boston, Massachusetts, USA. (2006).
87. Siebecker, M. G., Gonzalez, N., Norman, D., Institute for Central American Development Studies, "An assessment for combined production of rice and tilapia fish," Institute for Central American Development Studies (ICADS), San Jose, Costa Rica. (2004).

## Invited Presentations and Lectures

1. Siebecker, Matthew G., CASFER Convergence Research Seminar Series, "Impacts of swine waste application with subsequent inundations on nutrient and trace metal mobility in agricultural soils," CASFER. (October 2022).
2. Siebecker, M., Environmental Engineering Seminar, "Arsenic mobility, bioavailability, and speciation in contaminated titanium dioxide (TiO2) waste produced via drinking water filtration," Texas Tech Dept of Environmental Engineering. (October 2022).
3. Siebecker, Matthew G., Westfield State University, "Soil and environmental health implications of arsenic in contaminated water filtration waste." (February 2022).
4. Siebecker, M., Society For Advancement Of Chicanos/Hispanics And Native Americans In Science (SACNAS), "The importance of soils: Soil science and research in environmental soil chemistry." (September 2021).
5. Siebecker, M., Hand Coaching - Community Organization, "La Importancia de los Suelos (2 of 2)," Hand Coaching, Virtual presentation, Santiago, Chile. (August 13, 2020).
6. Siebecker, M., Hand Coaching - Community Organization, "La Importancia de los Suelos (1 of 2)," Hand Coaching, Virtual presentation, Santiago, Chile. (June 11, 2020).
7. Siebecker, M. G., TTU Department of Geosciences Seminar Series, "Rapid formation of heavy metal enriched LDH minerals measured in situ and the speciation of geogenic nickel in serpentine soils," Lubbock, Texas. (November 1, 2019).
8. Siebecker, M., 12th International Congress of Agronomy (presentation 1 of 2), "Tackling modern challenges in environmental soil chemistry: From environmental contaminants (nickel and arsenic) to agricultural nutrient cycling (potassium)," Universidad Dinamica UDC, Foz do Iguaçu, Brazil. (September 25, 2019).
9. Siebecker, M., 12th International Congress of Agronomy (presentation 2 of 2), "Tackling modern challenges in environmental soil chemistry: From environmental contaminants (nickel and arsenic) to agricultural nutrient cycling (potassium)," Universidad Dinamica UDC, Foz do Iguaçu, Brazil. (September 25, 2019).
10. Siebecker, M. G., Li, W., Sparks, D. L., Wang, Y., Chaney, R., American Chemical Society National Meeting, "Modeling EXAFS and XANES spectra of neoformed LDH and metal-enriched phyllosilicate minerals," American Chemical Society, San Diego, California, USA. (August 25, 2019).
11. Siebecker, M., TTU-China Global Bridge Program at Lanzhou University, "Tackling modern challenges in environmental soil chemistry: a research overview at TTU," Lanzhou, China. (June 27, 2019).
12. Siebecker, M., TTUHSC/TTU Research Collaboration Event, "Environmental Soil Chemistry Researh at TTU," Lubbock, TX. (May 15, 2019).
13. Siebecker, M., Seminar at the Institute for Soil Science, Chinese Academy of Science, "Applied environmental soil chemical research at Texas Tech University: Cycling and speciation of environmental contaminants (nickel and arsenic) and agricultural nutrients (potassium)," Dr. Yujun Wany, ISS-CAS, Nanjing, China. (May 13, 2019).
14. Siebecker, M., Seminar at Huazhong Agricultural University, "Applied environmental soil chemical research at Texas Tech University: From agricultural nutrient cycling (potassium) to environmental contaminants (arsenic)," Dr. Xionghan Feng, College of Resources and Environment, Huazhong Agricultural University, Wuhan, China. (May 10, 2019).
15. Siebecker, M., Seminar at China University of Geosciences, "Applied environmental soil chemical research at Texas Tech University: From agricultural nutrient cycling (potassium) to environmental contaminants (arsenic)," Dr. Junxia Li, China University of Geosciences, Wuhan, China. (May 9, 2019).
16. Siebecker, M., Li, W., Sparks, D. L., 15th International Conference on the Biogeochemistry of Trace Elements (ICOBTE), "Quick-Scanning EXAFS for in situ studies on trace metal precipitation," Nanjing, China. (May 6, 2019).

17. Siebecker, M., Seminar at Nanjing University, "Applied environmental soil chemical research at Texas Tech University: From agricultural nutrient cycling (potassium) to environmental contaminants (arsenic)," Dr. Wei Li, Nanjing University, School of Earth Sciences and Engineering, Nanjing, China. (May 5, 2019).
18. Siebecker, M., Seminar at Technological Institute of Costa Rica, Cartago, Costa Rica, "Quantification, speciation, and mobility of arsenic in soils and sediments: Examples, methods, and a case study of arsenic enriched sediments in Guanacaste, Costa Rica," Dr. Virginia Montero Campos, Environmental Engineering and Chemistry, Instituto Tecnológico de Costa Rica. (April 9, 2019).
19. Siebecker, M. G., Sparks, D. L., Luther, G. W., American Chemical Society National Meeting, "Precipitation and kinetics of mixed-metal solids in soils, sediments, and mineral systems: Implications for equilibrium speciation calculations," American Chemical Society, San Diego, California, USA. (March 2016).
20. Siebecker, M., Chaney, R. L., Sparks, D. L., 19th World Congress of Soil Science, "Nickel speciation in serpentine soils using synchrotron radiation techniques," International Union of Soil Science, Brisbane, Australia. (August 2010).

## Funding

Siebecker, M., Katie Lewis, "The role of dissolved silicon (Si) and mineral surface precipitation in enhancement of potassium (K) adsorption: Implications for K fixation in soil," Sponsored by Texas State Support Committee, $24,060.00. (January 2023 - December 2024).

Siebecker, M., "Impacts of swine and cattle waste application with subsequent inundations on nutrient and trace metal mobility in agricultural soils (Full Proposal)," Sponsored by CH Foundation, $66,940.00. (January 2023 - December 2024).

Siebecker, M., Lewis, K., "A Molecular and Kinetics Based Approach To Understand Potassium Sorption and Fixation To Soil Clay And Oxide Minerals In Agricultural Fields," Sponsored by USDA-NIFA, Federal, $335,489.00. (January 2021 - December 2023).

Siebecker, M., Christian Alvarez-Pugliese, Gerri Botte, Lindsey Slaughter, "Adsorption Capacities of Electrolysis treated Waste Activated Sludge (E-WAS) and Solid Nitrogen-Based Fertilizer (NBF) from Wastewater Treatment to Two Soil Types," Sponsored by CASFER (Center for Advancing Sustainable and Distributed Fertilizer Production), $44,999.19. (January 2023 - June 2023).

Slaughter, Lindsey, Christian Alvarez-Pugliese, Gerri Botte, Siebecker, M., "Electrolysis treated waste activated sludge (E-WAS) and nitrogen-based fertilizer (NBF) effects on plant growth," Sponsored by CASFER (Center for Advancing Sustainable and Distributed Fertilizer Production), $45,000.00. (January 2023 - June 2023).

Siebecker, M., Katie Lewis, "A kinetics and clay mineralogical approach to understand excessive potassium sorption and fixation to soil clay and metal oxide minerals in agricultural soils," Sponsored by TSSC, $11,550.00. (December 2022).

Jagadish SV, Krishna, Rudolph Ritz, Lindsey Slaughter, Haydee Echevarria Laza, Donna McCallister, Wenxuan Guo, Amy Boren Alpizar, Impa Somayanda, Siebecker, M. G., "Establishing climate smart commodities with reduced greenhouse gas footprints to enhance environmental and economic sustainability in the Texas High Plains," Sponsored by USDA Partnerships for Climate-Smart Commodities, $4,945,552.00.

Siebecker, M., Lewis, K., "A kinetics and clay mineralogical approach to understand excessive potassium sorption and fixation to soil clay and metal oxide minerals in agricultural soils," Sponsored by Texas State Support Committee, State of Texas Agency, $14,000.00. (January 2021 - December 2021).

Siebecker, M., "Acquisition of ICP-OES for research in PSS and CASNR," Sponsored by HEAF, $116,792.00. (January 2019).

Siebecker, M., "Mineralogical differences in treated soils for soil stabilization," Sponsored by M.T. Design LLC. (Dba) Stablesoil, $800.00. (April 2019).

Siebecker, M. (Lead Principal Investigator), Flores, N. G. (Supporting), Campos, V. M. (Supporting), Weindorf, D. (Principal Investigator), "Arsenic concentration, speciation, and mobility from soils, sediments, potable water filter waste residues in Bagaces/Bagatzi, Guanacaste province, Costa Rica," Sponsored by TTU OIA, $2,000.00.

## Professional Memberships

Professional Soil Science Association of Texas. (January 2020 - Present).

Geochemical Society. (December 2012 - Present).

American Chemical Society. (October 2012 - Present).

Soil Science Society of America. (January 2009 - Present).