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ASSOCIATE PROFESSOR

Soil and Environmental Biogeochemistry
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AREAS OF SPECIALIZATION AND INTERESTS

- 1) Biogeochemical cycling of nutrients, carbon, and trace metals in soils
- 2) Environmental geochemistry

EDUCATION

- 2006 - 2010 **Ph.D. Environmental Soil Chemistry**
Department of Plant and Soil Sciences
University of Delaware, Newark, DE; Advisor: Dr. Donald L. Sparks
- 2002 - 2005 **M.S. Environmental Chemistry**
Research Center for Eco-Environmental Sciences
Chinese Academy of Sciences, Beijing, China
- 1998 - 2002 **B.E. Environmental Engineering**
North China Electric Power University, Baoding, China

PROFESSIONAL EXPERIENCE

- 2019 - present **Associate Professor**
Department of Ecosystem Science and Management, University of Wyoming
- 2013 – 2019 **Assistant Professor**
Department of Ecosystem Science and Management, University of Wyoming
- 2010 – 2013 **Postdoctoral Research Fellow**
Energy Geoscience Division, Lawrence Berkeley National Laboratory, and
Department of Earth and Planetary Science, University of California, Berkeley, CA
Mentors: Dr. Glenn Waychunas (LBNL) and Dr. Jillian F. Banfield (UCB)
- 2006 – 2010 **Graduate Student Research Fellow**
University Doctoral Fellowship; Institute of Soil and Environmental Quality Graduate
Research Fellowship, University of Delaware

AWARDS AND HONORS

- 2018 *Soil Science Society of America Journal* Outstanding Associate Editor Award

2018	U.S. National Science Foundation Early Career Award
2018	UW Agricultural Experimental Station Early Career Research Achievement Award
2018	Distinguished Alumni, North China Electric Power University, China
2016, 2018	Nominee for National Synchrotron Light Source-II Users' Executive Committee Member
2014, 2017	Synchrotron Environmental Science Travel Award, Brookhaven National Laboratory
2010	Environmental Chemistry Graduate Student Awards, American Chemical Society
2009	Joe B. and Martha Dixon Soil Mineralogy Award, Soil Science Society of America
2009	University Doctoral Fellowship, University of Delaware
2006 – 2008	Graduate Fellowship, Institute of Soil and Environmental Quality, University of Delaware
2009	Graduate Student Travel Award, University of Delaware
2004 – 2005	Graduate Scholarship Award, Research Center for Eco-Environmental Sciences, Chinese Academy of Sciences
1999 – 2001	Excellent Student Award, North China Electric Power University, China
2000	Placed 2 nd in National College Contest in Mathematical Modeling, China

RESEARCH PROJECTS FUNDED

(Total \$2,637,712 with the federal contribution of \$2,042,355; Only list the allocations to Dr. Zhu’s own group)

Year	Agency	Funding	Title	Investigators
<i>Current</i>				
2021 -2022	USDA NIFA Multistate/Hatch fund	\$37,484	Improving phosphorus availability in high-P fixing alkaline and calcareous soils	Mengqiang Zhu (PI), Jay Norton (Co-PI)

2021 - 2022	Y Cross Ranch Tuition and Fee awards	\$9,000	For Ph.D. student Than Dam	Than Dam, Mengqiang Zhu
2021	Wyoming Agricultural Experiment Station’s FY21 competitive grants program	\$62,134	Elevating the analytical capability of CANR for soil phosphorus research	Mengqiang Zhu
2021 – 2024	USDA NIFA <i>Renewable Energy, Natural Resources, and Environment:</i> (ARFI 2021-67020-33422)	\$110,000 (<i>\$500K in total</i>)	Nitrogen limitation in high-elevation hay meadows: Understanding processes for improved agroecosystem health, function, and management	Jay Norton (PI), Mengqiang Zhu, Linda Van Diepen, and Ursula Norton
2020 – 2023	NSF Ecosystem Science Cluster	\$302,322	<i>Collaborative Project:</i> Climate effects on Mn oxidation state and Mn/SOM interactions	Mengqiang Zhu (PI, UW) and Peter Vitousek (PI, Stanford University)
2020 – 2025	NSF Division of Earth Science	\$382,916 (<i>\$5 million in total</i>)	<i>Critical Zone Network Cluster:</i> Patterns and controls of ecohydrology, CO ₂ fluxes, and nutrient availability in pedogenic carbonate-dominated dryland critical zones	Lixin Jin (PI, UTEP), Vanessa Loughed, Mengqiang Zhu, and other 7 co-PI/collaborators
2020 - 2022	Wyoming Microbial Ecology Collaborative	\$50,000	Formation and sources of mineral-associated organic matter across environmental gradients	Mengqiang Zhu (PI), Non-funded co-PIs: Franco Basile, Linda van Diepen, Alexander Gorony
2018 - 2023	NSF Early Career Award	\$684,434	Mineralogical and geochemical control of phosphorus dynamics during pedogenesis	Mengqiang Zhu

Past

2020 - 2021	Y Cross Ranch Tuition and Fee awards	\$9,000	For Ph.D. student Than Dam	Than Dam, Mengqiang Zhu
2020 - 2021	University of Wyoming Faculty Grant in Aid	\$7,500	Mineral protection of organic phosphorus and organic sulfur in soils	Mengqiang Zhu
2020 - 2021	Wyoming NASA Space Grant Consortium	\$20,000	Mineral-surface Catalyzed Formation of Manganese Oxides on Mars	Mengqiang Zhu
2019 - 2020	Global Perspective Grant	\$8,000	Impacts of climate on organic phosphorus dynamics in soils at the global scale	Mengqiang Zhu
2019 - 2020	AES Competitive Grant	\$10,000	Impacts of long-term flood irrigation on soil organic carbon and nitrogen dynamics in high elevation hay meadows	Mengqiang Zhu (PI), Jay Norton, Linda Van Dipe
2018 – 2019	Y Cross Ranch Tuition and Fee awards	\$9000	For Ph.D. student Than Dam	Than Dam, Mengqiang Zhu
2018 - 2019	Roy J. Shlemon Center for Quaternary Studies	\$8,220	Phosphorus (P) bioavailability in soil basalt weathering profiles of a 3-million-year-old chronosequence	Mengqiang Zhu
2017	Agriculture and Agri-Food Canada	\$8,000	Modulation of vegetation effects on organic P composition during pedogenesis in a semi-arid ecosystem	Mengqiang Zhu
2016 – 2019	Department of Energy-EPSCoR	\$450,000	Nucleation, Growth, and Aggregation of Todorokite Nanoparticles	Mengqiang Zhu (PI), Dongsheng

			from Both Geochemical and Materials Science Perspectives	Li (Non-funded Co-PI, PNNL) 4% funding rate
2016 – 2019	UW matching funds for Department of Energy-EPSCoR	\$46,500	Nucleation, Growth, and Aggregation of Todorokite Nanoparticles from Both Geochemical and Materials Science Perspectives	Mengqiang Zhu (PI), Dongsheng Li (Non-funded Co-PI, PNNL)
2016	Summer Research Apprentice Program (for high school students), Wyoming NSF EPSCoR	\$6,000	Removal of Mn(II) by manganese (IV) oxides using column experiments	Mengqiang Zhu
2016 – 2017	Roy J. Shlemon Center for Quaternary Studies	\$11,900	Phosphorus Speciation and Bioavailability Evolution During Soil Development in the Quaternary Period	Mengqiang Zhu
2015 – 2018	NSF Geobiology and Low-Temperature Geochemistry Program (EAR1529937)	\$261,953	The Geochemical Processes Controlling Mn(III) and Vacancy Concentrations in Birnessite Structure	Mengqiang Zhu (PI), Kenneth Livi (JHU) <i>10% funding rate</i>
2015 – 2016	School of Energy Resources, University of Wyoming	\$86,848	Pore-space Alteration Induced by Mineral Dissolution and Precipitation under Flow Conditions	Mengqiang Zhu (PI) Mohammad Piri
2015	Energy Clusters, College of Engineering, University of Wyoming	\$5,500	Travel fund to Goldschmidt Conference in Prague	Mengqiang Zhu
2014 – 2016	Wyoming Restoration and Reclamation Center	\$60,000	Trace Element Geochemistry of Soils in the Coalbed Natural Gas Produced Water Disposal Ponds in the Powder River Basin, Wyoming	Mengqiang Zhu (PI), K.J. Reddy, Bill DiRienzo (Wyoming DEQ)

2014 – 2016	University of Wyoming Agriculture Experimental Station (AES) Competitive Grants	\$74,302	Temporal and Spatial Variations of Soil Phosphorus Speciation in a Cold Semi-arid Climate	Mengqiang Zhu (PI), Larry Munn, David Williams, Jay Norton, Yongfeng Hu (CLS)
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SYNCHROTRON BEAMTIME USER’S PROPOSALS APPROVED (Selected)

Year	Light Sources	Title	Investigators
2020 - 2022	Canadian Light Source	Sulfur biogeochemical patterns across ecoclimatic domains at the continental scale	Mengqiang Zhu
2021 - 2023	Canadian Light Source	Control of climate on soil organic carbon sources and stabilization	Mengqiang Zhu
2021 - 2023	Stanford Synchrotron Radiation Lightsource	Climate effects on manganese oxidation state and mineralogy in soils at the continental scale	Mengqiang Zhu
2017 - 2019	Canadian Light Source	Phosphorus speciation and stability in aeolian dust	Mengqiang Zhu
2018 - 2020	Stanford Synchrotron Radiation Lightsource	Effects of ligands and NOM on structure and properties of Biogenic Mn oxides	Mengqiang Zhu
2015 - 2017	Canadian Light Source	Phosphorus speciation evolution across substrate age gradients	Mengqiang Zhu

WORKSHOPS ATTENDED

1. Tender Nanoprobe Workshop, Advanced Light Source, Lawrence Berkeley National Laboratory, Berkeley, March 17 – 18, **2021**
2. Using Synchrotron Light to Probe Plant, Soil, and Geologic Systems. Organizers: Devin Rippner (USDA), Tamas Varga (PNNL), and Mengqiang Zhu (UWyo), Advanced Light Source User Meeting, August 28, **2020**
3. Application and Data Analysis of Solution ³¹P NMR Spectroscopy in Soil Science. Organizers: Dr. Barbara Cade-Menun, Agriculture and Agri-Food Canada, Swift Current, Saskatchewan, July 27 – 30, **2016**

4. Integrating Synchrotron Techniques into Environmental Carbon Science, Organizers: Colleen Hansel and John Bargar, SSRL/LCLS Annual Users' Meeting & Workshops, Menlo Park, California, October 1, **2013**
5. MicroXAS Imaging with SSRL's New 2-5 keV Beam Line 14-3. Organizers: Samuel Webb, SSRL/LCLS Annual Users' Meeting & Workshops, Menlo Park, California, October 2, **2013**
6. Synchrotron Techniques in Metal Biogeochemistry: Across Time and Spatial Scales. Organizers: Colleen Hansel and John Bargar, SSRL/LCLS Annual Users' Meeting & Workshops, Menlo Park, California, October 2, **2013**

PUBLICATIONS ([Google Scholar Citations](#))

Books and special issues edited

1. Feng X., Li W., **Zhu M.**, Sparks D. L., *Advances in the Environmental Biogeochemistry of Manganese Oxides*, ACS Symposium Series, American chemical society, **2015**, ISBN13: 9780841230965, eISBN: 9780841230958.
2. Jun Y., **Zhu M.** and Peak D., *Frontiers and Advances in Environmental Soil Chemistry*, A special issue in *Geochemical Transactions* in honor of Prof. Donald Sparks, **2019**

Manuscripts in preparation (*graduate students; #post-docs; or [‡]visiting scholars)

Research area 1. Biogeochemical cycling (11)

1. [#]Mao H., [‡]Zhang J., Wang Q., Chen H., Hart S. and **Zhu M.**, Dual roles of clay in stabilizing microbial- and plant-derived organic carbon in dryland soils, in prep., **2021**
2. [#]Mao H., *Dam T.; Chadwick O.A., and **Zhu M.**, Chemical composition of organic carbon along a rainfall gradient in Hawaii, in prep., **2022**
3. *Gu C., Cade-Menun B., Hart S., Turner B., and **Zhu M.**, Microbial-induced chemical convergence of organic phosphorus composition during soil development, in prep., **2021**
4. [#]Zhang Z., M. Francesca Cotrufo, Wei Li and **Zhu M.**, Storage and speciation of organic phosphorus in mineral-associated organic matter at a continental scale, in prep., **2021**
5. [#]Zhang Z., M. Francesca Cotrufo, and **Zhu M.**, Storage and speciation of organic sulfur in mineral-associated organic matter at a continental scale, in prep., **2022**
6. *Dam T.; Condon, Leo; Turner, Benjamin; and **Zhu M.**, Controls of particulate and mineral-associated organic matter on organic phosphorus dynamics during soil development in a humid environment, in prep. **2021**

7. *Dam T.; Chadwick O.A., Yongfeng Hu, and **Zhu M.**, Effects of rainfall levels on organic sulfur mineralization in volcanic soils of Hawaii, in prep., **2021**
8. *Dam T.; Chadwick O.A., **Zhu M.**, Organic phosphorus composition and dynamics across a rainfall gradient in Hawaii, in prep., **2021**
9. *Dam T., Hart S., Rasmussen C., Turner B., and **Zhu M.**, Phosphorus biogeochemical transformation during soil development in a semi-arid environment, in prep., **2021**
10. *Wen K., Chadwick O.A., Paulus E. L., Landrot G., Kaszuba J. P., Luther G.W., Wang Z., Tappero R., Reinhart B., **Zhu M.**, Climate-driven accumulation of trivalent manganese in soils, in prep., **2021**
11. #Zhang Z., Yang P., Mao H., Zhao Z., Liu C. and **Zhu M.**, Manganese oxidation states and availability in granite weathering profiles of contrasting climate, in prep. **2021**

Research area 2. Environmental geochemistry (5)

12. *Hu Z., McKenna A.M., *Wen K., Feng X. and **Zhu M.**, Controls of removal ratios on molecular fractionation of dissolved organic matter by iron oxides, in prep., **2021**
13. [∃]Zhang Jianchao, Amy McKenna, **Zhu M.**, Macromolecular characterization of oxidation kinetics of dissolved organic matter by manganese oxides, in prep. **2022**
14. *Wen K., and **Zhu M.**, Mineral-surface catalyzed oxidation of Mn(II) by bromate: implications for Mn oxide occurrence in Martial soils, in prep., **2021**
15. *Li W., *Wen K., *Yang P., Zhang J., Liu F. and **Zhu M.**, Catalytic activity of Mn (oxyhydr)oxide polymorphs in degradation of organic dye by peroxymonosulfate, in prep., **2021**
16. **Zhu M.**, [∃]Ma D., and *Ke Wen, Effects of oxyanions on Mn(II) oxidation kinetics and products on mineral surfaces, in prep. **2021**

Manuscripts submitted (*graduate students; #post-docs; or [∃]visiting scholars)

1. Effects of Mn or Al incorporation on the structure, composition, and As(III) adsorption behavior of oxidized green rust, Wang X., Li X., Wang L., Lanson B., **Zhu M.**, Yin C., Liang X., and Feng X., submitted to *Geochim. Cosmochim. Acta.*, submitted to 12/**2021**
2. Ma H., Wang P., Thompson A.; Xie Q.; **Zhu M.**; Teng, H.; Fu P., Liu C., Chen C., Secondary Mineral Formation and Carbon Dynamics during FeS Oxidation in the Presence of Dissolved Organic Matter, submitted to *Environ. Sci. Technol.*, 12/**2021**
3. Zhang S., **Zhu M.**, Pedersen J.A., Gu B., Gilbert B., Wang Z., Li H., Liu J., Liu F., Liu Y. and Yin H., Methylmercury degradation by trivalent manganese, submitted to *Nat. Geosci.*, 12/**2021**

4. *Wen K., Chadwick O.A., Paulus E., Landrot G., Kaszuba J.P., Luther G.W., Wang Z., Tappero R., Reinhardt, B., and **Zhu M.**, Climate-driven accumulation of trivalent manganese in suboxic soils, submitted to *Environ. Sci. Technol.*, 12/2021

Published Peer-reviewed Journal Articles (78 in total)

(*graduate students; #post-docs; \$undergraduate students; or [∃]visiting scholars)

Research area 1. Biogeochemical cycling (6)

1. #Zhang Z., Mao H., Zhao, Z., Wang S., Liu C., Hu, Y. and **Zhu M.**, Fate and availability of dust-borne phosphorus in a sub-humid temperate forest, *Chem. Geol.*, **2022**, 587, 120628
2. *Dam T., Angert A., Krom M., Bigio L., Hu Y., Mayol-Bracero O., Santos-Figueroa Gilmarie, Pio Casimiro, Beyer Kevin, and **Zhu M.**, X-ray spectroscopic quantification of phosphorus transformation in Saharan dust during trans-Atlantic dust transport, *Environ. Sci. Technol.*, **2021**, *55*, 12694 – 12703
3. #Zhang Z., Liu C., Zhao Z., Oliver Chadwick, Hu Y. and **Zhu M.** Vertical distributions of phosphorus concentration and speciation in forest soil profiles of contrasting climate, *Geochim. Cosmochim. Acta*, **2021**, 310, 1-18
4. *Gu C., Hart S., Turner B., Chadwick O., Berhe A., Hu Y. and **Zhu M.**, Quantifying uncertainties in sequential chemical extraction of soil phosphorus using XANES spectroscopy, *Environ. Sci. Technol.* **2020**, 54, 2257-2267
5. *Gu C., Hart S., Tuner B., Hu Y., and **Zhu M.**, Aeolian dust deposition and the perturbation of phosphorus transformations during long term ecosystem development in a cool, semi-arid environment, *Geochim. Cosmochim. Acta*, **2019**, 246: 498 - 514
6. *Zhang Z., Goldstein HL, Reynolds R., Hu Y., *Wang X. and **Zhu M.**, Phosphorous speciation and solubility in aeolian dust deposited in the interior American west, *Environ. Sci. Technol.*, **2018**, 52 (5), 2658-2667

Research area 2. Environmental geochemistry (78)

7. [∃]Zhang J., McKenna A.M. and **Zhu M.**, Macromolecular Characterization of Compound Selectivity for Oxidation and Oxidative Alterations of Dissolved Organic Matter by Manganese Oxide, *Environ. Sci. Technol.*, **2021**, 55, 7741–7751,
8. Zhao W., Gu C., Ying H., Feng X., **Zhu M.**, Wang M., Tan W., Wang X., Fraction distribution of heavy metals and its relationship with iron in polluted farmland soils around distinct mining areas, *App. Geochem.*, **2021**, 130, 104969

9. Jung H., Snyder C., Xu W., Wen K., **Zhu M.**, Li Y., Lu A., and Tang Y., Photocatalytic Oxidation of Dissolved Mn^{2+} by TiO_2 and the Formation of Tunnel Structured Manganese Oxides, *ACS Earth Space Chem.*, **2021**, 5, 2105-2114
10. Yan X., **Zhu M.**, Li W., Peacock C., Ma J., Wen H., Liu F., Zhou Z., Zhu C., and Yin H. Cadmium isotope fractionation during adsorption and substitution with iron (oxyhydr)oxides, *Environ. Sci. Technol.*, **2021**, 55, 11601–11611
11. Ren C., *Yang P., Sun J., Bi E.Y., Gao J., Palmer J., **Zhu M.**, Wu Y., Liu J., A Bioinspired Molybdenum Catalyst for Aqueous Perchlorate Reduction, *J. Am. Chem. Soc.* **2021**, 143 (21), 7891-7896
12. Ying H., Huang K., Feng X., Yan Y., **Zhu M.**, Wang Z., Huang Q., and Wang X. As (III) adsorption-oxidation behavior and mechanisms on Cr(VI)-incorporated schwertmannite, *Environmental Science: Nano*, **2021**
13. Wan B., *Yang P., Jung H., **Zhu M.**, Diaz J.M., Tang Y., Iron oxides catalyze the hydrolysis of polyphosphate and precipitation of calcium phosphate minerals, *Geochim. Cosmochim. Acta*, **2021**
14. #Wang X., Ying H., Zhao W., Feng X., Tan W., Beyer K.A., Huang Q., Liu F., **Zhu M.**, Molecular scale understanding of sulfate exchange from schwertmannite by chromate versus arsenate, *Environ. Sci. Technol.*, **2021**, 55, 5857–5867
15. *Yang P., *Wen K., Beyer K.A., Xu W., *Wang Q., Ma D., Wu J. and **Zhu M.**, Inhibition of oxyanions on Mn(II)-reductive transformation of layered manganese oxides, *Environ. Sci. Technol.*, **2021**, 55, 5, 3419–3429
16. Wang Q., *Yang P., Wang X., Zhang L., Feng X., **Zhu M.**, Wang Z., Oxidation of Mn (III) species by Pb (IV) oxide as a surrogate oxidant in aquatic systems, *Environ. Sci. Technol.*, **2020**, 54, 21, 14124–14133
17. ³Ma D., ³Wu J., *Yang P. and **Zhu M.**, Coupled manganese redox cycling and organic carbon degradation on mineral surfaces, *Environ. Sci. Technol.*, **2020**, 54, 14, 8801–8810
18. Rathi B., Jamieson J., Sun J., Siade A., **Zhu M.**, Cirpka OA, Pommer H., Process-based modeling of arsenic(III) oxidation by manganese oxides under circumneutral pH conditions, *Wat. Res.*, **2020**, 185, 116195
19. Ren C., *Yang P., Gao J., Huo X., Min X., Bi EY, Liu Y., Wang Y., **Zhu M.** and Liu J., Catalytic Reduction of Aqueous Chlorate with MoO_x Immobilized on Pd/C, *ACS Catalysis*, **2020**, 10, 15, 8201–8211

20. Jun Y., **Zhu M.**, and Peak D., Frontiers and advances in environmental soil chemistry: a special issue in honor of Prof. Donald L. Sparks, *Geochem. Trans.*, **2020**, 21, 1-3
21. Ying H., Feng X., **Zhu M.**, Lanson B., Liu F. and Wang X., Formation and transformation of schwertmannite through direct Fe^{3+} hydrolysis under various geochemical conditions, *Environ. Sci.: Nano*, **2020**, 7, 2385-2398
22. Fortunato, J.; Pena, J.; Benkaddour, S.; Zhang, H.; Huang, J.; **Zhu, M.**; Logan, B.; Gorski, C., Surveying manganese oxides as electrode materials for harnessing salinity gradient energy Status, *Environ. Sci. Technol*, **2020**, 54, 5746–5754
23. Lu Y, Hu S., Liang Z., **Zhu M.**, Wang Z., Wang X., Liang Y., Dang Z. and Shi Z., Incorporation of Pb (II) into hematite during ferrihydrite transformation, *Environ. Sci.: Nano*, **2020**, 7, 829-841
24. Liang X, Post J.E, Lanson B., Wang X., **Zhu M.**, Liu F., Tan W., Feng X., Zhu G., Zhang X., and De Yoreo J. Coupled morphological and structural evolution of $\delta\text{-MnO}_2$ to $\alpha\text{-MnO}_2$ through multistage oriented assembly processes: the role of Mn (III), *Environmental Science: Nano*, **2020**, 7, 238-249
25. *Yang P., Post J.E., *Wang Q., Xu W., Geiss R., McCurdy P. and **Zhu M.**, Metal adsorption controls stability of layered manganese oxides, *Environ. Sci. Technol.* **2019**, 53, 7453-7462 (Selected for supplementary cover page)
26. #Wang X., Philips B., Boily, J.F., Hu Y., Hu Z., Yang P., Feng X., Xu W., and **Zhu M.**, Phosphate sorption speciation and precipitation mechanisms on amorphous aluminum hydroxide, *Soil Syst.* **2019**, 3(1), 20
27. Wang X., Peng J., Liang X., **Zhu M.**, Lanson B., Wang L., Liang X., Liu F., Tan W. and Feng X., Effects of Mn^{2+} , Ni^{2+} and Cu^{2+} on the formation and transformation of hydrosulfate green rust: reaction processes and underlying mechanisms, *ACS Earth Space Chem.*, **2019**, 3(4), 519-530
28. *Wang Q., *Yang P. and **Zhu M.**, Effects of cations on structural transformation of birnessite by fulvic acid, *Geochim. Cosmochim. Acta*, **2019**, 250, 292-310
29. Lan S., Wang X., Yang P., Qin Z., **Zhu M.**, Zhang J., Liu F., Tan W., Huang Q. and Feng X., The catalytic effect of AQDS as an electron shuttle on Mn (II) oxidation to birnessite on ferrihydrite at circumneutral pH, *Geochim. Cosmochim. Acta*, **2019**, 247, 175 -190
30. Sun Q., Liu C., Cui P., Fan T., **Zhu M.**, Alves M., Siebecker M., Sparks D., Wu T., Li W., Zhou D. and Wang Y., Formation of Cd precipitates on $\gamma\text{-Al}_2\text{O}_3$: Implications for Cd sequestration in the environment, *Environ. Int.*, **2019**, 126, 234-241

31. *Yang P, Lee S., Post J.E., Xu H. *Wang Q., Xu W. and **Zhu M.**, Trivalent manganese on vacancies triggers rapid transformation of layered to tunneled manganese oxides (TMOs): Implications for occurrence of TMOs in low-temperature environment, *Geochim. Cosmochim. Acta*, **2018**, 240:173-190
32. Zhao S., *Wang Q., Sun J., Borkiewicz O.J., Huang R., Saad E.M., Fields B., Chen S., **Zhu M.** and Tang Y., Effect of Zn(II) presence during mineral formation on the structure of layered Mn oxides, *Chem. Geol.*, **2018**, 493:234-245
33. #Wang X., Wang Z., Peak D., Feng X., and **Zhu M.**, Quantification of Co-existing Sulfate Inner- and Outer-Sphere Complexation on Hematite Surfaces, *ACS Earth Space Chem.*, **2018**, 2 (4), 387–398
34. #Wang X., Kubicki J.D., Boily J. F., Glenn W.A., Hu Y., Feng X., and **Zhu M.**, Binding Geometries of Silicate Species on Ferrihydrite Surfaces, *ACS Earth Space Chem.*, **2018**, 2 (2), 125 - 134
35. *Wang Q., *Yang P. and **Zhu M.**, Structural Transformation of Birnessite by Fulvic Acid under Anoxic Conditions, *Environ. Sci. Technol.*, **2018**, 52 (4), 1844 -1853
36. Hu S., Lu Y., Peng L., Wang P., **Zhu M.**, Dohnalkova A.C., Chen H., Lin Z., Dang Z. and Shi Z., Coupled kinetics of ferrihydrite transformation and As(V) sequestration under the effect of humic acids: A mechanistic and quantitative study, *Environ. Sci. Technol.*, 52 (20), 11632–11641
37. Feng X., Wang P., Shi Z., Kwon K.D., Zhao H., Hui Y., Lin Z., **Zhu M.**, Liu F., Sparks D.L., A Quantitative Model for the Coupled Kinetics of Arsenic Adsorption/Desorption and Oxidation on Manganese Oxides, *Environ. Sci. Technol. Lett.*, **2018**, 5 (3), 175–180
38. Chen S., Zhang S., Wang T., Lei Z., **Zhu M.**, Dai X., Liu F., Li J., Yin H., Structure and Properties of Vanadium-doped δ -MnO₂ and Enhanced Pb²⁺ Adsorption and Phenol Photocatalytic Degradation, *Mater. Chem. Phys.*, **2018**, 208, 258 - 267
39. Sun Q., Cui P., Fan T.T., Wu S., **Zhu M.**, Alves M.E., Zhou D.M., Wang Y., Effects of Fe (II) on Cd (II) immobilization by Mn (III)-rich δ -MnO₂, *Chemical. Eng. J.*, **2018**, 353, 167-175
40. Dou X., Wang G., **Zhu M.**, Liu F., Li W., Mohan D., Pittman C. Identification of Fe and Zr oxide phases in an iron-zirconium binary oxide and arsenate complexes adsorbed onto their surfaces, *J. Hazard. Mater.*, **2018**, 353 (5), 340-347
41. #Wang X., Hu Y., Tang Y., *Yang P., Feng X., Xu W. and **Zhu M.**, Phosphate and Phytate Adsorption and Precipitation on Ferrihydrite Surfaces, *Environ. Sci.: Nano*, **2017**, 4, 2193 - 2204
42. Qafoku O., Pearce C.I., Neumann A., Kovarik L., **Zhu M.**, Ilton ES, Bowden ME., Resch CT., Arey BW, Arenholz E., Felmy AR., Rosso K.M., Tc (VII) and Cr (VI) Interaction with Naturally

- Reduced Ferruginous Smectite from a Redox Transition Zone, *Environ. Sci. Technol.* **2017**, 51 (16), 9042 - 9052
43. Liang X., Zhao Z., **Zhu M.**, Liu F., Wang L., Yin H., Qiu G., Cao F., Liu X. and Feng X., Self-Assembly of Birnessite Nanoflowers by Staged Three-Dimensional Oriented Attachment, *Environ. Sci.: Nano*, **2017**, 4, 1656 - 1669
 44. Wan B., Yan Y., **Zhu M.**, Wang X., Liu F., Tan W. and Feng X., Quantitative and Spectroscopic Investigations of the Co-sorption of Myo-inositol Hexakisphosphate and Cadmium (II) on to Hematite, *Eur J. Soil. Sci.*, **2017**, 68 (3): 374 - 383
 45. Wang Y., Fan T., Liu C., Li W., **Zhu M.**, Fan J., Gong H., Zhou D. and Sparks D.L., Macroscopic and Microscopic Investigation of Adsorption and Precipitation of Zn on γ -alumina in the Absence and Presence of As, *Chemosphere*, **2017**, 178:309-316
 46. Saad E., Sun J., Chen S., Borkiewicz, Z., **Zhu M.**, Duckworth, O. and Tang Y., Siderophore and Organic Acid Promoted Dissolution and Transformation of Cr(III)-Fe(III)-(oxy)hydroxides, *Environ. Sci. Technol.*, **2017**, 51 (6):3223
 47. Legg B., **Zhu M.**, Zhang H., Waychunas G., Gilbert B. and Banfield J., A Model for Nucleation A Model for Nucleation When Nuclei Are Nonstoichiometric: Understanding the Precipitation of Iron Oxyhydroxide Nanoparticles, *Cryst. Growth Des.*, **2016**, 16:5726
 48. *Wang Q., ^SLiao X., Xu W., Livi K.J., Ren Y. and **Zhu M.**, Synthesis of Birnessite in the Presence of Phosphate, Silicate or Sulfate, *Inorg. Chem.*, **2016**, 55:10248
 49. *Gu C., Wang Z., Kubicki J.D., *Wang X. and **Zhu M.**, X-ray Absorption Spectroscopic Quantification and Speciation Modeling of Sulfate Adsorption on Ferrihydrite Surfaces, *Environ. Sci. Technol.*, **2016**, 50:8067
 50. Wang X., **Zhu M.**, Koopal L.K., Li W., Xu W., Liu F., Zhang J., Liu Q., Feng X., Sparks D.L., Effects of Crystallite Size on the Structure and Magnetism of Ferrihydrite, *Environ. Sci.: Nano*, **2016**, 3:190-202
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INVITED DEPARTMENT SEMINARS

1. **Zhu M.**, The role of soil fine materials in stabilizing organic carbon and phosphorus in a semi-arid ecosystem, Department of Biology, San Diego State University, San Diego, CA January 31, **2022**
2. **Zhu M.**, Impacts of dust inputs on phosphorus dynamics and availability in terrestrial ecosystems, Department of Earth, Environmental and Resource Sciences, University of Texas at EL Paso, October 25, **2021**
3. **Zhu M.**, Iron Oxyhydroxide Formation: from Molecular Clusters to Nanoparticles, Department of Environmental Engineering Environmental Nanogeochemistry Group, Peking University, April 27, **2021**
4. **Zhu M.**, Applications of phosphorus K-edge XANES spectroscopy for studying phosphorus geochemistry in environmental samples, Dryland Critical Zone Nutrient Group, University of Texas at EL Paso, Texas, March 31, **2021**
5. **Zhu M.**, Redox-driven formation and transformation of manganese oxides in Earth’s critical zone, Department of Geoscience, Stony Brook University, Stony Brook, New York, Feb 20, **2020**
6. **Zhu M.**, Phosphorus geochemistry in aeolian dust and impacts of dust input on phosphorus dynamics in ecosystems, Department of Soil and Crop Science, Colorado State University, Fort Collins, CO, Feb 27, **2020**
7. **Zhu M.**, Redox-driven transformation of layered to tunneled manganese oxides, Basic Energy Science Geochemistry Group Meeting, Lawrence Berkeley National Laboratory, January 22, **2020**
8. **Zhu M.**, Impacts of climate on manganese geochemistry in soils, Environmental and Soil Biogeochemistry Group, Department of Earth System Science, Stanford University, October 23, **2019**
9. **Zhu M.**, Phosphorus Biogeochemical Transformations during Soil Development, Department of Water and Soil Science, University of Florida, June 26, **2019**
10. **Zhu M.**, Redox-driven Mn oxide formation and transformation in Earth’s Critical Zone, Department of Earth and Planetary Science, University of California, Berkeley, CA, April 17, **2019**

11. **Zhu M.**, Mineral nanoparticle: Key players in Natural and Engineered Environmental Systems, Department of Civil and Environmental Engineering, Department Seminar, Florida State University, March 4, **2019**
12. **Zhu M.**, Redox-driven formation and transformation of manganese oxides in Earth’s Critical Zone, Department of Earth Science, Dartmouth College, Hanover, NH, January 31, **2019**
13. **Zhu M.**, Geochemistry of dust-borne phosphorus and its impacts on terrestrial ecosystems, Biogeoscience Seminar, University of California – Santa Barbara, December 5, **2018**
14. **Zhu M.**, Soil Minerals: Key Players in Biogeochemistry of Soil Systems, Department of Environmental Science and Technology, Department Seminar, University of Maryland, College Park, September 11, **2018**
15. **Zhu M.**, Crystal Structure and Environmental Geochemical Reactivity of Layered Manganese Oxides, Nanjing University of Agriculture, Nanjing, Jiangsu, China, July 13, **2018**
16. **Zhu M.**, Crystal Structure and Geochemical Reactivity of Manganese Oxides, Guiyang Institute of Geochemistry, Chinese Academy of Sciences, Guiyang, Guizhou, China, July 5, **2018**
17. **Zhu M.**, Structure and Environmental Geochemical Reactivity of Layered Manganese Oxides, School of Environmental Science and Engineering, Southern University of Science and Technology, Shenzhen, Guangdong, China, June 22, **2018**
18. **Zhu M.**, Crystal Structure and Geochemical Reactivity of Layered Mn Oxides, Guangzhou Institute of Geochemistry, Chinese Academy of Sciences, Guangzhou, Guangdong, China, June 19, **2018**
19. **Zhu M.**, Structure and Environmental Chemical Reactivity of Layered Manganese Oxides, School of Environment and Energy, South China University of Technology, Guangzhou, Guangdong, China, June 18, **2018**
20. **Zhu M.**, Aeolian Dust Deposition Perturbs Phosphorous Biogeochemical Transformation, School of Earth Surface Systems, Tianjin University, Tianjin, China, August 17, **2017**
21. **Zhu M.**, Structural Transformation of Layered Mn Oxides during Oxidative Precipitation and Reductive Dissolution: Implications for Metal Fate and Transport, Institute of Soil Sciences, Chinese Academy of Sciences, Nanjing, China, August 15, **2017**
22. **Zhu M.**, Iron Oxyhydroxide Formation in solution: From Molecular Clusters to Nanoparticles, College of Environmental Science and Engineering, Nanjing University, Nanjing, China, August 14, **2017**

23. **Zhu M.**, Phosphorus Biogeochemical Transformation and Effects of Aeolian Dust Deposition during Long-term Soil Development in Semi-arid Ecosystems, UC Merced Environmental Systems Seminar, Wednesday, January 25, **2017**
24. **Zhu M.**, Phosphorous Transformation during Pedogenesis and its Fixation Mechanisms on Mineral Surfaces, Institute of Soil Sciences, Chinese Academy of Sciences, Nanjing, China, August 14, **2016**
25. **Zhu M.**, Effects of Mineral-Water Interfacial Processes for Metal Fate and Transport in the Environment, School of Environmental Science and Engineering, Nanjing University, Nanjing, China, August 10, **2016**
26. **Zhu M.**, Structure and Reactivity of Layered Mn oxides: Implications for Metal Fate and Transport in the Environment, School of Earth Science and Engineering, Nanjing University, Nanjing, China, August 9, **2016**
27. **Zhu M.**, Structure and Reactivity of Layered Mn oxides: Implications for Metal Fate and Transport in the Environment, Beijing University, Beijing, China, August 3, **2016**
28. **Zhu M.**, Phosphorous Transformation during Pedogenesis and its Fixation Mechanisms on Mineral Surfaces, China Agricultural University, Beijing, China, August 2, **2016**
29. **Zhu M.**, Mineral Reactivity Controls Metal Fate and Transport in the Environment, School of Environmental Engineering, North China Electric Power University, Baoding, January 7, **2014**
30. **Zhu M.**, Applications of Synchrotron X-ray Techniques in Studying Soil Fertility, Department of Plant Nutrition, China Agriculture University, Beijing, January 4, **2014**
31. **Zhu M.**, A Quick-EXAFS Study of Fe(III) Precipitation. Research Center for Eco-Environmental Sciences, Chinese Academy of Sciences, Beijing, China, Beijing, January 3, **2014**
32. **Zhu M.**, Ferric Iron Hydrolysis and Precipitation: A New Pathway Identified. Colorado State University, Department of Crop and Plant Sciences, Fort Collins, CO, November 11, **2013**
33. **Zhu M.**, Molecular-Scale understanding of ferric iron hydrolysis and precipitation, Institute of Soil Sciences, Chinese Academy of Sciences, Nanjing, China, September 19, **2013**
34. **Zhu M.**, Structure and Reactivity of Biogenic Mn Oxides, Huazhong Agricultural University, College of Natural Resources and Environment, Wuhan, China, September 18, **2013**
35. **Zhu M.**, Iron Oxyhydroxide Precipitation: from Molecular Clusters to Nanoparticles, Huazhong Agricultural University, College of Natural Resources and Environment, Wuhan, China, September 17, **2013**

36. **Zhu M.**, Minerals Dictate Metal Fate and Transport in Natural and Engineered Environmental Systems, Department of Civil and Environmental Engineering, University of Houston, Houston, April 3, **2013**
37. **Zhu M.**, Key Role of Soil Minerals in Metal Biogeochemical Cycling, Department of Ecosystem Science and Management, University of Wyoming, March, Laramie, March 4, **2013**
38. **Zhu M.**, Environmental Mineral Nanoparticles: Key Players in Metal Biogeochemical Cycling, Department of Earth and Environmental Sciences, Temple University, Philadelphia, February 23, **2013**
39. **Zhu M.**, Iron Oxide formation: from Molecular Clusters to Nanoparticles, Advanced Photon Source Users Meeting, Argonne National Laboratory, Argonne, Chicago, December 21, **2012**

INVITED CONFERENCE/WORKSHOP PRESENTATIONS

1. **Zhu M.** and Wen K., Mineral-surface catalyzed oxidation of Mn(II) by bromate: implications for the occurrence of Mn oxide on Mars, Symposium of Geochemistry in Extreme Environment, American Chemical Society Meetings, March 20 - 24, **2022**
2. **Zhu, M.**, Impacts of Dust Inputs on Phosphorus Dynamics and Availability in Soils, Southern New Mexico & Western U.S. Dust Symposium, October 25 – 27, **2021**
3. **Zhu M.**, Hu Z., Zhang J., Wen K., McKenna A., Feng X., Adsorption and Oxidation of Dissolved Organic Matter by Iron and Manganese Oxides: Insights from ESI-FT-ICR Mass Spectrometry, 11th International Conference of Interfaces Against Pollution (IAP2021), Wuhan, China, May 14 - 17, **2021**
4. **Zhu M.**, Mn(II)-promoted phase transformation of manganese oxides, American Chemical Society Meetings, San Antonio, April 15, **2021**
5. **Zhu M.**, Deciphering phosphorus biogeochemistry in soils using tender X-ray absorption spectroscopy; Tender Nanoprobe Workshop, Advanced Photon Source, Lawrence Berkeley National Laboratory, Berkeley, March 17 – 18, **2021** (Lighting talk)
6. **Zhu M.**, Scaling-up Soil Chemical Research from Molecular to Continental and Global Scales, A Diverse Soil Science Future, World Soil Day 2020 Virtual Event, National Academy of Science, December 4, 2020
7. **Zhu M.**, Zhang J. and McKenna M., Oxidative degradation of dissolved organic matter by manganese oxide, American Chemical Society Meetings, San Francisco, CA, August 17 - 21, **2020**
8. **Zhu M.**, Adsorption, precipitation or polymerization of silicate, phosphate and sulfate on iron oxide surfaces, American Chemical Society Meetings, Philadelphia, PA, March 22-26, **2020**

(canceled due to the pandemic)

9. **Zhu M.** and Yang P., Mn(II)-promoted phase transformation of manganese oxides, American Chemical Society Annual Meeting, Philadelphia, PA, March 22-26, **2020** (*Michael Hochella honoring session*) *(canceled due to the pandemic)*
10. **Zhu M.**, Zhang J., and Mckenna A., Oxidative decomposition of natural organic matter by manganese oxide, American Chemical Society Meetings, Philadelphia, PA, March 22-26, **2020** *(canceled due to the pandemic)*
11. **Zhu M.**, Coupled Mn oxidation and natural organic matter degradation on mineral surfaces, ASA, CSSA and SSSA International Meetings, San Antonio, TX, November 10 - 13, **2019**
12. **Zhu M.**, Phosphorus distribution and speciation in granite weathering profiles and
13. impacts of aeolian dust inputs, Southern Sierra Critical Zone Observatory Annual meeting, Merced, CA, August 22, **2019**
14. **Zhu M.** Chadwick O., Wen K. and Zhang Z., Influence of redox on Mn geochemistry across the Maui rainfall gradient, Annual Hawaii Ecosystem Meetings, Hilo, Hawaii, July 1 - 2, **2019**
15. **Zhu M.**, Phosphorus biogeochemical transformations in ecosystems, International Workshop on Frontiers in Molecular Environmental Soil Science, Chinese Academy of Agricultural Sciences (CAAS), Beijing, China, May 9 – 10, **2019**
16. **Zhu M.**, Structural Dynamics of Manganese Oxides during Manganese Redox Cycling, 15th International Conference on the Biogeochemistry of Trace Elements (ICOBTE) in Nanjing, China, May 5 – 9, **2019**
17. **Zhu M.**, Transformation Pathway of Layered to Tunneled Manganese Oxides: the Role of Mn(III) Adsorbed on Vacancies, Goldschmidt Conference, Boston, August 12 – 17, **2018**
18. **Zhu M.**, Structural transformation of birnessite by partial reduction, 55th Clay Mineral Society Meeting, Urbana Champaign, June 11- 14, **2018**
19. **Zhu M.**, Phosphorus Biogeochemical Transformation and Effects of Aeolian Dust Deposition during Long-term Soil Development in Semi-arid Ecosystems, Synchrotron Environmental Science Symposium 7, Brookhaven National Laboratory, Long Island, New York, October 30 – November 1, **2017**
20. **Zhu M.**, Understanding Phosphate and Silicate Adsorption, Precipitation and Polymerization on Mineral Surfaces Using Differential PDF Analysis, 253rd ACS National Meeting in San Francisco, CA, April 2 - 6, **2017**
21. **Zhu M.**, Geochemical Processes Controlling Mn(III) and Vacancy Concentrations in Layered Manganese Oxides, 252nd ACS National Meeting in Philadelphia, PA, August 21 - 25, **2016**

VOLUNTEERED CONFERENCE PRESENTATIONS (*students; #postdocs; ^Evisiting scholars)

1. *Dam T., Chadwick O., Hu Y., and **Zhu M.**, Soil sulfur speciation across rainfall gradients, ASA, CSSA and SSSA International Annual Meetings, Salt Lake City, Utah, November 7 - 11, **2021**
2. **Zhu M.**, Zhang J., Ma D. and Wang Q., Oxidation and adsorption of dissolved organic matter by manganese and iron Oxides, ASA, CSSA and SSSA International Annual Meetings, Salt Lake City, Utah, November 7 - 11, **2021**
3. #Zhang, Zhuojun; Zhao, Zhiqi; Liu, Congqiang; Chadwick, Oliver A.; Hu, Yongfeng; and **Zhu M.**, Effects of climate and dust inputs on phosphorus availability and speciation in forest soil profiles, American Chemical Society National Meetings, Atlanta, August 22-26, **2021**
4. **Zhu M.** and *Yang P. Effects of Co-existing Cations and Anions on Mn(II)-driven Redox Transformation of Layered Manganese Oxides, American Chemical Society National Meetings, Atlanta, August 22-26, **2021** (Michael Hochella’s honoring symposium)
5. **Zhu M.**, A combination of chemical extractions and XANES spectroscopy to assess phosphorus availability and chemistry in environmental solids, American Chemical Society National Meetings, Atlanta, August 22-26, **2021**
6. #Mao H., Zhang J., McKenna A.M., Hart S.C., and **Zhu M.**, Effects of clay minerals and vegetation type on the composition of dissolved organic matter in soils of a semi-arid environment, American Chemical Society National Meetings, Atlanta, August 22-26, **2021**
7. *Hu Z., McKenna A.M., Wen K., Feng X. and **Zhu M.**, Insensitivity of molecular fractionation of dissolved organic matter to surface chemistry of iron oxides, American Chemical Society National Meetings, Atlanta, August 22-26, **2021**
8. *Dam T., Condon L., Turner B.L., and **Zhu M.**, Storage of Mineral-associated Organic Phosphorus During Soil Development, American Chemical Society National Meetings, Atlanta, August 22-26, **2021**
9. *Ke Wen, Oliver Chadwick, Lizzie Paulus, Gautier Landrot, **Zhu M.**, Climate-driven redox dynamics of manganese in soils, Hawaiian Ecosystems Meetings, July 1 -2, **2021**
10. **Zhu M.**, *Than Dam, Oliver Chadwick, and Mohsen Shakouri, Organic Sulfur Composition in Volcanic Soils across A Rainfall Gradient, Hawaiian Ecosystems Meetings, July 1 -2, **2021**
11. **Zhu M.**, *Wen K., Chadwick, and #Zhang Z., Influence of Redox on Manganese Geochemistry across a Rainfall Gradient in Hawaii, Goldschmidt Conference, Honolulu, Hawaii, June **2020**

12. **Zhu M.**, *Dam T., Angert A., Bigio L., Krom M., Mayol-Bracero O.L., Figueroa G.S. and Pio C., Spectroscopic characterization of phosphorus transformation in Saharan dust during trans Atlantic dust transport, Goldschmidt Conference, Honolulu, Hawaii, June **2020**
13. #Zhang Z., Yang P., Liu C., Zhao Z. and **Zhu M.**, Impacts of climate on manganese distribution and speciation in granite weathering profiles, ASA, CSSA and SSSA International Annual Meetings, San Antonio, TX, November 10 - 13, **2019**
14. *Dam T., Hart S., Condron L., and **Zhu M.** Modulation of climate conditions on impacts of dust inputs on phosphorus transformation during ecosystems development, ASA, CSSA and SSSA International Annual Meetings, San Antonio, TX, November 10 - 13, **2019**
15. *Wen K., Chadwick O.A., Zhang Z. and **Zhu M.**, Impacts of climate on Mn oxidation state composition in Hawaiian soils, ASA, CSSA and SSSA International Annual Meetings, San Antonio, TX, November 10 - 13, **2019**
16. *Dam T., Gross A., Angert A., **Zhu M.**, Speciation Changes Dust-Borne Phosphorus during the Dust Transport from Sahara Desert to America Forest, 2018-2019 International Soils Meeting, San Diego, CA, January 6-9, **2019**. Oral Presentation
17. **Zhu M.**, *Gu C., Hart S., Turner B. and Hu Y., Perturbation of Phosphorus Transformations by Aeolian Dust Deposition during Long Term Ecosystem Development, 2018-2019 International Soils Meeting, San Diego, CA, January 6-9, **2019**. Oral Presentation
18. **Zhu M.**, *Gu C., Hart S., Turner B. and Hu Y. Aeolian Dust Deposition and the Perturbation of Phosphorus Transformations during Long-Term Ecosystem Development, Goldschmidt Conference, Boston, August 12 – 17, **2018**. Oral Presentation
19. **Zhu M.**, *Yang P., Lee S., Post J.E., Xu H., *Wang Q. and Xu W., Divalent Mn-Promoted Rapid Transformation of Layered to Tunneled Manganese Oxide, 2018 Geosciences Program PI Meeting, Office of Basic Energy Sciences, Gaithersburg, Maryland, August 7-9, **2018**, Oral Presentation
20. ³Ma D. and **Zhu M.**, Coupled redox cycling of Mn and organic carbon on iron oxide surfaces, 55th annual meeting of The Clay Minerals Society, Urbana, IL, June 11 – 14, 2018
21. **Zhu M.**, Wang X., and Gu C., Identification and Quantification of Silicate, Phosphate, and Sulfate Species on Iron Oxide Surfaces Using Spectroscopic and Atomic Pair Distribution Function Analyses, 55th annual meeting of The Clay Minerals Society, Urbana, IL, June 11 – 14, 2018
22. *Yang P., Lee S., Post J.E., Xu H., Wang Q., Xu W., **Zhu M.**: Rapid Transformation of Layered to Tunneled Mn Oxides Triggered by Trivalent Mn Adsorbed on Vacancies, 55th annual meeting of The Clay Minerals Society, Urbana, IL, June 11 – 14, 2018

23. *Yang P., *Wang Q., Xu W., and **Zhu M.**, Effects of Ligands on Structural Transformation of Birnessite during the Reaction with Mn(II), 255th ACS National Meeting in New Orleans, LA, March 18 - 22, **2018**, Poster presentation
24. *Yang P., Lee S., Post J.E., Xu H., *Wang Q. Xu W., and **Zhu M.**, Rapid Transformation of Layered to Tunneled Manganese Oxide Triggered by Interlayer Mn(III), 255th ACS National Meeting in New Orleans, LA, March 18 - 22, **2018**, Oral presentation
25. *Wang Q., *Yang P., and **Zhu M.**, Reductive Dissolution Kinetics of birnessite by Natural Organic Matters, 255th ACS National Meeting in New Orleans, LA, March 18 - 22, **2018**, Oral presentation
26. **Zhu M.**, The role of trivalent manganese in mineralogy and geochemistry of birnessite, 255th ACS National Meeting in New Orleans, LA, March 18 - 22, **2018**, Oral presentation
27. *Gu C., Hart S.C., Munn L.C., Hu Y., and **Zhu M.** Evaluation of the Walker and Syers model using phosphorous K-edge XANES spectroscopy for four semi-arid soil chronosequences, Synchrotron Environmental Science Symposium 7, Brookhaven National Laboratory, Long Island, New York, October 30 – November 1, **2017**, Poster presentation
28. *Gu C., Hart S.C., Berhe A.A, Hu Y and **Zhu M.** Phosphorus Speciation in the Pools of the Walker and Syers Model, ASA, CSSA and SSSA International Annual Meetings, Tampa, Florida, October 22-25, **2017**, Oral presentation
29. **Zhu M.** and *Wang Q., Effects of Cations on Structural Transformation of Layered Manganese Oxides during Oxidation of Fulvic Acid, ASA, CSSA and SSSA International Annual Meetings, Tampa, Florida, October 22-25, **2017**, Oral presentation
30. *Zhang Z., Goldstein H., Reynolds R., and **Zhu M.**, Phosphorus Speciation in Dust and Source Soils in the Interior American West, 253rd ACS National Meeting in San Francisco, CA, April 2 - 6, **2017**, Poster presentation
31. *Zhang Z., Liu C., Zhao Z. and **Zhu M.** Distribution and Speciation of Phosphorus in a Granite Weathering Profile in a Temperate Climate, 253rd ACS National Meeting in San Francisco, CA, April 2 - 6, **2017**, Oral presentation
32. *Wang Q., *Yang P. and **Zhu M.**, Adsorption and Oxidation of Fulvic Acid by Birnessite under Various pH Conditions, 253rd ACS National Meeting in San Francisco, CA, April 2 - 6, **2017**, Poster presentation
33. *Wang Q., *Yang P. and **Zhu M.**, Cation Effects on the Adsorption and Oxidation of Fulvic Acid by Manganese Oxides, 253rd ACS National Meeting in San Francisco, CA, April 2 - 6, **2017**, Oral presentation

34. *Yang P., *Wang Q. and **Zhu M.**, Reactions of Birnessite with Mn(II) under Anoxic Conditions, 253rd ACS National Meeting in San Francisco, CA, August 21-25, **2016**, Poster presentation
35. *Yang P., *Wang Q., and **Zhu M.**, Cation Effects on the Reaction between Birnessite and Mn(II), 253rd ACS National Meeting in San Francisco, CA, August 21-25, **2016**, Oral presentation
36. **Zhu M.**, Application of Differential Atomic Pair Distribution Function Analysis in Determining Nutrient Fixation Mechanisms on Mineral Surfaces, ASA, CSSA and SSSA International Annual Meetings, Phoenix, Arizona, November 6 – 9, **2016**. Oral presentation
37. *Gu C., Hart, S.C., Cade-Menun B.J., Hu Y. and **Zhu M.** Applicability of Sequential Chemical Extraction in Determining Phosphorus Transformation during Soil Development Under Semi-Arid Climate. ASA, CSSA and SSSA International Annual Meetings, Phoenix, Arizona, November 6 – 9, **2016**. Poster presentation
38. *Gu C., Evans S.E., Burke I.C. and **Zhu M.**, Phosphorus Speciation Evolution Across a Climate Gradient in Semi-Arid Prairie Soils, ASA, CSSA and SSSA International Annual Meetings, Phoenix, Arizona, November 6 – 9, **2016**. Poster presentation
39. **Zhu M.** and *Wang X., Differential pair distribution function and spectroscopic characterization of phosphate and phytate adsorption and precipitation on ferrihydrite surfaces, 252nd ACS National Meeting in Philadelphia, PA, August 21-25, **2016**. Oral presentation
40. *Wang Q., *Liao X., Xu W., Livi K., Ren Y., and **Zhu M.**, Single approach to synthesize birnessite of various sizes, 251st ACS National Meeting, San Diego, CA, March 13 - 17, **2016**, Poster presentation
41. #Wang X. and **Zhu M.**, Structural characterization of phosphate and silicate surface species on metal oxides, 251st ACS National Meeting, San Diego, CA, March 13 - 17, **2016**, Poster presentation
42. *Gu C., Evans S.E., Burke I.C. and **Zhu M.**, Phosphorus Speciation Changes in Semi-arid Grassland Soils along a Climate Gradient in Inner Mongolia, China, 251st ACS National Meeting, San Diego, CA, March 13 - 17, **2016**, Poster presentation
43. #Wang X., Peak D. and **Zhu M.**, Sulfate Complexation on Hematite Surfaces, 251st ACS National Meeting, San Diego, CA, March 13 - 17, **2016**, Oral presentation
44. *Wang Q., *Yang P. and **Zhu M.**, Adsorption and Oxidation of Fulvic Acid by Birnessite, 251st ACS National Meeting, San Diego, CA, March 13 - 17, **2016**, Oral presentation
45. *Yang P., *Wang Q., Livi K., **Zhu M.**, Cation Effects on the Reactions of Birnessite with Mn(II), 251st ACS National Meeting, San Diego, CA, March 13 - 17, **2016**, Oral presentation

46. *Gu C., Hart S.C., Cade-Menun B.J., Hu Y., Munn L.C., and **Zhu M.**, Phosphorus Speciation Evolution During Pedogenesis in a Semi-arid Environment, 251st ACS National Meeting, San Diego, CA, March 13 - 17, **2016**, Oral presentation
47. *Wang Q., *Yang P. and **Zhu M.**, Adsorption and oxidation of fulvic acid by birnessite, Critical Zone Science, Sustainability, and Services in a Changing World, West Lafayette, IN, October 22 – 24, **2015**, Poster presentation
48. **Zhu M.**, *Gu C, *Wang X, Kubicki J, and Feng X, Sulfate complexation on iron(III) oxyhydroxide surfaces and in the structure of schwertmannite, 25th Goldschmidt Conference, Prague, Czech Republic, August 16 – 21, **2015**, Oral presentation
49. Wang Y., Fan T., Zhou D., Li W., **Zhu M.** and Donald Sparks, Macroscopic and microscopic investigation of adsorption and precipitation of Zn on γ -alumina as affected by As, 249th ACS National Meeting, Denver, CO, March 22-26, **2015**, Oral presentation
50. Tang Y., Huang R., Fields B., **Zhu M.**, and Zhao S., Enhanced phosphate sorption on metal-doped birnessite, 249th ACS National Meeting, Denver, CO, March 22-26, **2015**. Oral presentation
51. *Gu C., *Wang X., **Zhu M.**, Identification and quantification of sulfate surface complexes on ferrihydrite, 249th ACS National Meeting, Denver, CO, March 22-26, **2015**. Oral presentation
52. *Wang X., *Gu C., Feng X. and **Zhu M.**, The sulfate coordination environment in Schwertmannite, 249th ACS National Meeting, Denver, CO, March 22-26, **2015**. Oral presentation
53. *Wang Q., *Liao X. and **Zhu M.**, Effects of the presence of oxyanions during birnessite synthesis on birnessite particle sizes and application for removal of lead, 249th ACS National Meeting, Denver, CO, March 22-26, **2015**. Oral presentation
54. **Zhu M.**, *Gu C. and Wang Z., Identification and Quantification of Sulfate Surface Complexes Formed on Ferrihydrite Surfaces Under Various Experimental Conditions, ASA, CSSA and SSSA International Annual Meeting, Long Beach, November 2-5, **2014**, Oral presentation
55. *Wang X., *Gu C., Feng X-H, and **Zhu M.**, The Sulfate Local Atomic Environment in Schwertmannite, ASA, CSSA and SSSA International Annual Meeting, Long Beach, November 2-5, **2014**, Poster presentation
56. *Wang X., Li W., **Zhu M.**, Feng X-H, and Sparks. D.L., Effect of Ferrihydrite Crystallite Size on Phosphate Adsorption Reactivity, ASA, CSSA and SSSA International Annual Meeting, Long Beach, November 2-5, **2014**, Oral presentation

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57. *Gu C., Munn L.C., Hart S.C., Hu Y., and **Zhu M.**, Phosphorus Speciation during Soil genesis in a Semi-arid Environment, ASA, CSSA and SSSA International Annual Meeting, Long Beach, November 2-5, **2014**, Oral presentation
 58. *Wang X., Gu C., Feng X-H and **Zhu M.**, Sulfate Coordination Environment in Schwertmannite, Synchrotron Environmental Science VI, Argonne National Laboratory, Chicago, IL. September 11-12, **2014**, Poster presentation
 59. **Zhu M.**, Banfield J.F., and Waychunas G.A., Precipitation Pathways for Ferrihydrite Formation in Acidic Solutions, Synchrotron Environmental Science VI, Argonne National Laboratory, Chicago, IL. September 11-12, **2014**, Oral presentation
 60. Gilbert, B., Legg B., **Zhu M.**, Zhang H., Saldi G. D., Duval D., Knauss K. G., Waychunas G. A., and Banfield J. F., Role of iron chemistry in oxyhydroxide nucleation and olivine carbonation, Geosciences Research Program, Office of Basic Energy Sciences, Geosciences Models –Where are the Rocks? Gaithersburg, Maryland, May 14-16, **2014**
 61. **Zhu M.** Molecular structure of sulfate adsorption complexes on ferrihydrite: Impacts of pH, ionic strength, and wetness, 247th American Chemical Society National Meeting, Dallas, March 16 – 20, **2014**. Oral presentation
 62. Feng X., Zhao H., Liu F., Tan W., Qiu G., Yin, H., Li W., **Zhu M.** and Sparks, D. L., Transformation of hexagonal birnessite into triclinic birnessite by aqueous Mn(II) and the formation of todorokite, 247th American Chemical Society National Meeting, Dallas, March 16 – 20, **2014**. Oral presentation
 63. **Zhu M.**, et al., Sulfate adsorption on ferrihydrite studied by sulfur K-edge EXAFS spectroscopy and differential PDF analyses. 245th American Chemical Society National Meeting, New Orleans, April 7 – 11, **2013**. Oral presentation
 64. Feng, X., Li W., **Zhu M.**, Northrup P. and Sparks D. L. Sorption mechanism of myoinositol hexaphosphate on boehmite: A ³¹P NMR and P EXAFS Study. 245th American Chemical Society National Meeting, New Orleans, Louisiana, April 7-11. **2013**. Oral presentation
 65. Borch T., Shimizu M., Obst M., **Zhu M.**, and Kappler A. Structure and reactivity of ferrihydrite-organic matter coprecipitates. 245th American Chemical Society National Meeting, New Orleans, Louisiana, April 7-11. **2013**. Oral presentation
 66. **Zhu M.**, et al., *In situ* structural characterization of ferric iron dimers in aqueous nitrate solutions: Identification of μ -oxo species, 244th American Chemical Society National Meeting, Philadelphia, PA, Aug. 19-23, **2012**. Poster presentation
 67. **Zhu M.**, et al., Ferrihydrite formation: from molecular clusters to nanoparticles, 244th American Chemical Society National Meeting, Philadelphia, PA, August 19-23, **2012**. Oral presentation

68. **Zhu M.**, et al., Early-stage phase transformation and growth of iron oxyhydroxides during neutralization of simulated acid mine drainage, Goldschmidt 2012 Conference, Montréal, Jun 24-29, **2012**. Oral presentation
69. Livi K.J.T., Lafferty B., **Zhu M.**, Zhang S., Gaillot A., and Sparks D.L., Nanoscale Measurement of Manganese Calence in Mn-oxides, Goldschmidt 2012 Conference, Montréal, Jun 24-29, **2012**. Oral presentation
70. Dideriksen K., Gilbert B., Frandsen C., **Zhu M.**, Stipp S.L.S., and Banfield J.F., The possible role of crystal conduction and inter-particle electron transfer in Fe-oxide phase transformation and growth, Goldschmidt 2012 Conference, Montréal, Jun 24-29, **2012**. Oral presentation
71. **Zhu M.**, et al., Study of Formation and Aggregation of Akaganeite Nanoparticles Using In situ Small Angle X-ray Scattering, 243rd American Chemical Society National Meeting, San Diego, CA, Mar. 25-29, **2012**. Oral presentation
72. **Zhu M.**, et al., Study of Interactions Between Cations and Nanoparticulate Layered Mn Oxides Using X-ray Atomic Pair Distribution Functions (PDF), 243rd American Chemical Society National Meeting, San Diego, CA, Mar 25-29, **2012**. Poster presentation
73. **Zhu M.**, et al., Time-resolved Study of Early-stage Formation of Iron Oxyhydroxide Nanoparticles in Simulated Acid Mine Drainage (AMD) Solutions, AGU Fall Meeting, San Francisco, CA, Dec. 5 – 9, **2011**. Poster presentation
74. **Zhu M.**, et al., Time-resolved Study of Early-stage Formation of Schwertmannite Nanoparticles in Iron Sulfate Solutions, 48th The Clay Minerals Society annual meeting, Lake Tahoe, NV, Sept. 25 – 30, **2011**. Oral presentation
75. **Zhu M.**, et al., Time-resolved Study of Early-stage Formation of Iron Oxyhydroxide Nanoparticles, 242nd American Chemical Society National Meeting, Denver, CO, Aug. 28-Sept. 1, **2011**. Oral presentation
76. Legg B.A., Comolli L.R., Csencsits R., **Zhu M.**, Gilbert B., and Banfield J.F., Using Cryo Transmission Electron Microscopy to Characterize Nanoparticle aggregate structure, 242nd American Chemical Society National Meeting, Denver, CO, Aug. 28-Sept. 1, **2011**. Oral presentation
77. **Zhu M.**, et al., Effects of Zn^{2+} and Ni^{2+} on reduction of δ - MnO_2 by dissolved Mn^{2+} , 242nd American Chemical Society National Meeting, Denver, CO, Aug. 28-Sept. 1, **2011**. Poster presentation
78. **Zhu M.**, et al., Structural Study of Biotic and Abiotic Poorly Crystalline Layered Manganese Oxides Using the Atomic Pair Distribution Function Technique, Geological Society of America (GSA) Annual Meeting, Denver, CO, Oct. 31-Nov. 3, **2010**. Oral presentation

79. Ginder-Vogel M., Lafferty B.J., **Zhu M.**, and Sparks D.L., Simultaneous As(III) and As(V) retention by hydrous Mn(IV) oxide, 239th American Chemical Society National Meeting, San Francisco, CA, March 21 – 25, **2010**. Oral presentation
80. **Zhu M.**, et al., Structural Investigation of Biogenic Mn-oxides Using Synchrotron X-ray Techniques, Department of Plant and Soil Sciences Symposium, Newark, DE. May 20, **2010**. Oral Presentation
81. **Zhu M.**, et al., Structural Study of Poorly Crystalline Layered Manganese Oxides Using the Atomic Pair Distribution Function Technique, ASA-CSSA-SSSA 2009 International Annual Meetings, Pittsburg, PA., Nov. 1-5, **2009**. Oral presentation
82. **Zhu M.**, et al., A Quantum Chemical and X-ray Absorption Spectroscopy Investigation of Arsenic and Nickel Sorption Mechanism on Mn-oxides. DFG-IUSS Symposium on Advances in Molecular Modeling of Biogeochemical Interfaces-Perspectives for Soil Research, Jena, Germany, Oct. 6-9, **2009**. Oral presentation
83. Sparks, D.L. and **Zhu M.** The Value of a Multi-Scale, Multi-Tool Approach in Elucidating Metal(loid) Biogeochemistry in the Environment. DFG-IUSS Symposium on Advances in Molecular Modeling of Biogeochemical Interfaces- Perspectives for Soil Research, Jena, Germany, October 6-9, **2009**. Keynote.
84. **Zhu M.** et al., pH Effects on the Structure of Biogenic Mn-oxides, 237th American Chemical Society National Meeting, Salt Lake City, Utah, March 22-26, **2009**. Oral presentation
85. **Zhu M.** and D. L. Sparks. Ni (II) Sorption on Biogenic Manganese Oxides Formed at Various pHs. GSA-ASA-CSSA-SSSA Joint Annual Meeting, Houston, Texas, Oct. 5-9, **2008**. Poster presentation
86. Parikh S.J., Jonsson C.M., Jonsson C.L., **Zhu M.**, Hazen R.M., Sverjensky D.A., and Sparks D.L., Molecular Mechanisms of Glutamic and Aspartic Acid Sorption to Oxyhydroxide Minerals, GSA-ASA-CSSA-SSSA Joint Annual Meeting, Houston, Texas, Oct. 5-9, **2008**. Oral presentation
87. Feng XH, Ginder-Vogel M., **Zhu M.**, and Sparks D., Birnessite formation and its transformation in acid media, 236th American Chemical Society National Meeting, Philadelphia, Pennsylvania, Aug. 17-21, **2008**. Oral presentation
88. **Zhu M.**, et al., Quantum Chemical Modeling of Arsenic (III, V) Adsorption and Oxidation on Manganese Oxides. 236th American Chemical Society National Meeting, Philadelphia, Pennsylvania, Aug. 17-21, **2008**. Oral presentation
89. **Zhu M.**, et al., pH-induced Structural Change in Biogenic Mn(IV)-oxides. 236th American Chemical Society National Meeting, Philadelphia, PA, Aug. 17-21, **2008**. Poster presentation

90. **Zhu M.**, et al., Effects of Environmental Conditions on the Properties of Biogenic Manganese Oxides, ASA-CSSA-SSSA International Annual Meeting, New Orleans, Louisiana, Nov. 4-8, **2007**, Oral presentation
91. **Zhu M.**, et al., Effects of P and Ca on adsorption kinetics and filtration removal of As(V) by AA, GFO and TiO₂, 232nd American Chemical Society National Meeting, San Francisco, CA. Sept 10-14, **2006**. Poster presentation
92. **Zhu M.** and Pan G., Metastable Equilibrium Adsorption (MEA) Theory IX: Quantum Chemical and XAFS Studies of Zinc Adsorption on Manganite, The China International Symposium on Persistent Toxic Substances, May **2004**. Poster presentation
93. **Zhu M.** and Pan G., Metastable Equilibrium Adsorption (MEA) theory VIII. Quantum Chemical and XAFS Studies of Zinc Species in Water Solution under Full pH Conditions, The China International Symposium on Persistent Toxic Substances, May **2004**. Poster presentation

TEACHING, ADVISING AND MENTORING

Courses Taught

2020	Introduction to Soil Science (Soil 2010), Spring, undergraduate, 4 credits
2014 – Present	Chemistry of the Soil Environment (SOIL 4130/5130), Spring, under/graduate, 3 credits
2018 – Present	Watershed Water Quality Management (REWM 4710/5710), Spring, graduate, 3 credits
2014 – Present	Environmental Quality (SOIL 3130), Fall, undergraduate, 3 credits
2015 – 2017	Environmental Soil Mineralogy (SOIL 5590-01), Fall, graduate, 3 credits

Post-doctoral Advisees

04/2019- present	Zhuojun Zhang, Dept. of Ecosystem Sci. & Mgt., University of Wyoming
04/2019 - present	Hairuo Mao, Dept. of Ecosystem Sci. & Mgt., University of Wyoming
09/2016 – 03/2017	Fei Wang, Dept. of Ecosystem Sci. & Mgt., University of Wyoming
08/2015 – 09/2016	Xiaoming Wang, Dept. of Ecosystem Sci. & Mgt., University of Wyoming

Doctoral Advisees

08/2021 – present	Jung-Chen Liu
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06/2021 – present	Carson Thompson
01/2021 – Present	Rael Otuya (Co-advised with Linda van Diepen)
09/2017 – Present	Ke Wen
09/2017 – Present	Than Dam
11/2014 – 05/2019	Peng Yang (Currently a post-doc at Argonne National Laboratory)
06/2014 – 05/2018	Qian Wang (Currently a post-doc at Georgia Tech)
02/2014 – 05/2018	Chunhao Gu (Currently a post-doc at University of Delaware and previously at UIUC)

Master’s Advisee

02/2021 – present Karen C. McNicholas

Undergraduate Advisees

1/2021 – 5/2021	Jace Rasmussen, Department of Botany, University of Wyoming
10/2020 – 5/2021	Ethan Maglione, Department of Ecosystem Science and Management, University of Wyoming
09/2015 – 05/2018	Victor Wang, Department of Chemistry, University of Wyoming
09/2015 – 05/2017	Kacey C. Myers, Department of Animal Science, University of Wyoming
10/2015 – 05/2016	Zackary S. Fullerton, Department of Molecular Biology, University of Wyoming
09/2015 – 03/2016	Sam F. Belew, School of Energy Resources, University of Wyoming
09/2014 – 09/2015	Yifei Shao, Department of Chemistry, University of Wyoming
10/2014 – 02/2015	Zackary C. Meek, Department of Ecosystem Sci. & Mgt., University of Wyoming
07/2014 – 02/2014	Xianya Liao, China University of Geosciences, Wuhan, China
2012	John Li, Department of Earth and Planetary Science, University of California, Berkeley

High School Student Advisees

06/2016 – 07/2016 Cameron Miller, Cheyenne South High School, Cheyenne WY

06/2016 – 07/2016 Nicholas McDaniel, Cypress Woods High School, Houston TX

Visiting Students and Scholars

11/2019 – present Zhen Hu, visiting Ph.D. student, Huazhong Agriculture University, China

09/2018 – 09/2019 Wei Li, visiting Ph.D. student, Huazhong Agriculture University, China

10/2018 – 10/2019 Dr. Jianchao Zhang, visiting scholar, Tianjing University, China

09/2017 – 09/2019 Dr. Dong Ma, Qingdao Agricultural University, visiting scholar, China

09/2017 – 09/2018 Dr. Juan Wu, Qingdao Agricultural University, visiting scholar, China

10/2017 – 01/2018 Dr. Hongtu Xie, visiting scholar, Institute of Applied Ecology, Chinese Academy of Sciences, Shenyang, China

02/2016 – 10/2017 Zhuojun Zhang, visiting Ph.D. student, Institute of Geochemistry, Chinese Academy of Sciences, Guiyang, China

08/2015 – 08/2016 Dr. Xiuhong Jia, Ph.D., visiting scholar, Huazhong Agricultural University, Wuhan, China

07/2014 – 06/2015 Xiaoming Wang, visiting Ph.D. student, Huazhong Agricultural University, Wuhan, China

Student Dissertation and Thesis Committees (other than students in my research group)

2021 - present Ph.D. dissertation committee, Daniel McCrae Adamson, Department of Ecosystem Science and Management, University of Wyoming

2017 - 2021 Ph.D. dissertation committee, Chelsea Duball, Department of Ecosystem Science and Management, University of Wyoming

2018 - 2020 Ph.D. dissertation committee, Alero Jennifer Gure, Department of Geology and Geophysics, University of Wyoming

2017 – 2019 MS. thesis committee, Opelousas Wonuola Olawale, Department of Petroleum Engineering, University of Wyoming

2015 – 2020 Ph.D. dissertation committee, Yun Xie, Department of Petroleum Engineering, University of Wyoming

- 2016 – 2018 MS. thesis committee, Lindsay J. Arvin, Department of Geology and Geophysics, University of Wyoming
- 2013 – 2018 Ph.D. dissertation committee, Shiliang Zhao, School of Earth and Atmospheric Sciences, Georgia Institute of Technology
- 2015 – 2017 Master dissertation committee, Amber Elizabeth Zandanel, Department of Geology and Geophysics, University of Wyoming

PROFESSIONAL SERVICES

National and International Level

- 2017 – Present Associate Editor, *Soil Science Society of America Journal*
- 2016 – Present Associate Editor, *Geochemical Transactions*
- 2009 – Present Manuscript Reviewer
Environmental Science and Technology Letter, Environmental Science and Technology, Geochimica et Cosmochimica Acta, Chemical Geology, Soil Science Society of America Journal, Environmental Science: Nano, Journal of Environmental Quality, Water Research, American Mineralogist, Geochemical Transactions, Proceedings of the National Academy of Sciences of the United States of America, Langmuir, Journal of Colloid and Interface Sciences, Journal of Hazardous Materials, Chemosphere, Environmental Pollution, Journal of Physical Chemistry C., Applied Catalysis B, Nanoscale Research Letter, Spectrochimica Acta A
- 2012 – Present Synchrotron X-ray Facility User Proposal Reviewer, Stanford Synchrotron Radiation Lightsource (average 3 proposals a year), Canadian Light Source (average 5 proposals a year)
- 2011 – Present Grant Proposal Reviewer and Panelist
- 1) Panelist, USDA-NIFA review panel, 2021
 - 2) Panelist, NSF Graduate Research Fellowship, 2021, 2022
 - 3) Panelist, NSF – Geobiology and Low-Temperature Geochemistry Program, 2019
 - 4) Ad hoc reviewer, NSF – Geobiology and Low-Temperature Geochemistry Program, since 2013
 - 5) Ad hoc reviewer, Department of Energy-Basic Energy Science Program, since 2020
- 2021 - present Review tenure and promotion packages (2)
- 2014 Committee Chair, Student Presentation Competition, Soil Chemistry Division, Soil Science Society of America, Long Beach, California

- 2012 – 2018 Co-chair, Symposium/workshop organized
- 1) Geochemistry and biogeochemistry of dust, New Orleans, LA, December 13 – 17, 2021
 - 2) Molecular-scale processes of phosphorus cycling in natural and engineered systems, Atlanta, GA, August 22 – 26, 2021
 - 3) Using Synchrotron Light to Probe Plant, Soil, and Geologic Systems. Organizers: Devin Rippner (USDA), Tamas Varga (PNNL), and Mengqiang Zhu (UWYO), Advanced Light Source User Meeting, August 28, 2020
 - 4) Structure, reactivity, and energetics of layered Earth materials, San Francisco, CA, August 2020
 - 5) Identifying and modeling mechanistic drivers of elemental cycles across the Critical Zone, Goldschmidt Conference, Boston, August 12 – 17, 2018
 - 6) Structures and reactivity of clays and nanoparticles in soils and sediments, The 55th Annual Meeting of the Clay Minerals Society, Illinois, IL June 11 – 14, 2018
 - 7) Formation, structure, reactivity, and applications of manganese oxides, 255th American Chemical Society, New Orleans, March 18 – 22, 2018
 - 8) Iron and manganese oxides: their formation, structure, reactivity, and applications, 254th American Chemical Society, Washington D.C., August 20 – 24, 2017
 - 9) Iron oxides: formation, structure, reactivity and applications, 249th American Chemical Society, Denver, March 22 – 26, 2015
 - 10) Advances in understanding the environmental geochemistry of manganese (Mn) oxides, 247th American Chemical Society, Dallas, March 16 – 20, 2014
 - 11) Advances in understanding the chemistry of light elements at environmental interfaces, 245th American Chemical Society, New Orleans, April 7 – 11, 2013
 - 12) Nucleation, growth and aggregation of mineral particles in geochemical and biogeochemical systems, American Geophysical Union, San Francisco, December 3-7, 2012

University and Departmental Level

- 2021 Review panel, WY NASA Space Grant Graduate Research Fellowships
- 2020 – Present College Tenure and Promotion Committee, College of Agriculture and Natural Resources
- 2018 Search Committee, a campus-wide post-doc position in Transmission Electron Microscopy
- 2017 – Present College Curriculum Committee, College of Agriculture and Natural Resources, University of Wyoming

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- 2014 – 2016 Ad hoc department seminar organizer, Department of Ecosystem Science and Management, University of Wyoming
- 2015 Search Committee, Assistant Professor position in Soil Microbiology, Department of Ecosystem Science and Management, University of Wyoming
- 2013 – 2015 Wyoming Stable Isotope Facility Steering Committee, University of Wyoming
- 2014 Grant Proposal Panelist, 250 K Initiative, University of Wyoming
- 2013 – 2020 Graduate Student Recruiting Committee, Department of Ecosystem Science and Management, University of Wyoming

Professional Society Memberships

American Geological Union, Soil Science Society of America, The Geochemical Society, American Chemical Society