

## Elizabeth M. Herndon

Senior Staff Scientist, Environmental Sciences Division, Oak Ridge National Laboratory

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### Professional Employment

<b>2022 – present</b>	Senior Staff Scientist, Environmental Sciences Division, Oak Ridge National Lab
<b>2019 – present</b>	Joint Faculty, Earth & Planetary Sciences, University of Tennessee – Knoxville
<b>2019 – 2021</b>	Staff Scientist, Environmental Sciences Division, Oak Ridge National Laboratory
<b>2014 – 2019</b>	Assistant Professor, Department of Geology, Kent State University
<b>2013 – 2014</b>	Postdoctoral Researcher, Environmental Sciences Division, Oak Ridge National Lab
<b>Fall 2012</b>	Instructor, Department of Geosciences, The Pennsylvania State University

### Education

<b>2012</b>	Ph.D., Geosciences and Biogeochemistry, Pennsylvania State University Dissertation title: <i>Biogeochemistry of manganese contamination in a temperate forested watershed</i>
<b>2007</b>	B.A., Earth & Planetary Sciences; Chemistry: Biochemistry concentration (double major), Washington University in Saint Louis ( <i>magna cum laude</i> ) Honors thesis: <i>Microbial arsenic processes in shallow marine hydrothermal systems</i>

### Awards and Honors

#### Postgraduate Awards

- Department of Energy Early Career Research Program grant recipient (2022)
- Outstanding New Faculty Research and Scholarship Award, Kent State University (2019)
- Kavli Frontiers of Science Fellow (2019)
- National Science Foundation CAREER Award grant recipient (2018)

#### Student Awards

- Donald B. and Mary E. Tait Scholarship in Microbial Biogeochemistry, Penn State University
- Arnulf I. Muan Graduate Fellowship in Earth and Mineral Sciences, Penn State University
- University Graduate Fellowship, Penn State University
- Courtney Werner Memorial Prize in Earth & Planetary Sciences, Washington University in Saint Louis
- Compton Fellowship in Natural Sciences, Washington University in Saint Louis

### Publications

#### Peer-reviewed Journal Articles

\*indicates mentee author; †indicates senior author

1. Berens, M.\*, Michaud, A., VanderJeugd, E., Miah, I., Sutor, F., Emerson, D., Bowden, W., Kinsman-Costello, L., Weintraub, M., and Herndon, E.† (2024) Phosphorus interactions with iron in undisturbed and disturbed Arctic tundra ecosystems. *Environmental Science & Technology*.  
<https://doi.org/10.1021/acs.est.3c09072>
2. Sulman, B., and Herndon, E. (2024) Modeling interactive effects of manganese bioavailability, nitrogen deposition, and warming on soil carbon storage. *Journal of Geophysical Research Biogeosciences* 129(5), e2023JG007830. <https://doi.org/10.1029/2023JG007830>

3. Herndon, E., Richardson, J., Carrell, A., Pierce, E., and Weston, D. (2024) Sulfur speciation in Sphagnum peat moss modified by mutualistic interactions with cyanobacteria. *New Phytologist*. 241(5). <https://doi.org/10.1111/nph.19476>
4. Barczok, M. \*, Smith, C., Di Domenico, N., Kinsman-Costello, L., Singer, D., and Herndon, E.† (2023) Influence of contrasting redox conditions on Fe (oxyhydr)oxide transformation and associated phosphate sorption. *Biogeochemistry* 166, 87-107. <https://doi.org/10.1007/s10533-023-01094-z>
5. Andrews, H.B., Wymore, A. M., Wetter, E. E., Herndon, E. M., Li, H., Martin, S. A., Griffiths, N. A., Yang, X., Wellington, M., Weston, D. J., and Martin, M. Z. (2023) Rapid Screening of Wood and Leaf Tissues: Investigating Silicon-based Phytoliths in *Populus trichocarpa* for Carbon Storage Applications using Laser-Induced Breakdown Spectroscopy and Scanning Electron Microscopy–Energy Dispersive X-Ray Spectroscopy. *Journal of Analytical Atomic Spectrometry* 38, 2353-2364. <https://doi.org/10.1039/D3JA00186E>
6. Montgomery, A., Herndon, E., Sims, C., and Jagadamma, S.† (2023) Manganese sources and rates impact plant Mn concentrations and soil Mn fractions. *Soil Science Society of America Journal* 87(5): 1120-1135. <https://doi.org/10.1002/saj2.20570>
7. Barczok, M. \*, Smith, C., Di Domenico, N., Kinsman-Costello, L., and Herndon, E.† (2023) Variability in soil redox response to seasonal flooding in a vernal pond. *Frontiers in Environmental Science* 11, 1114814. <https://doi.org/10.3389/fenvs.2023.1114814>
8. Wood, D. L., Cole, K. A., Herndon, E. M., and Singer, D. M. (2023) Lime slurry treatment of abandoned coal mine spoil: linking contaminant transport from the micrometer to pedon-scale. *Applied Geochemistry* 151: 105617. <https://doi.org/10.1016/j.apgeochem.2023.105617>
9. Neupane, A., Herndon, E., Whitman, T., Faiia, A., and Jagadamma, S. (2023) Manganese effects on plant residue decomposition and carbon distribution in soil fractions depend on soil nitrogen availability. *Soil Biology and Biochemistry* 178: 108694. <https://doi.org/10.1016/j.soilbio.2023.108964>
10. Santos, F. \*, and Herndon, E.† (2023) Plant-soil relationships influence observed trends between Mn and C across biomes. *Global Biogeochemical Cycles* 37(1), e2022GB007412. <https://doi.org/10.1029/2022GB007412>
11. Li, H. \*, Reinhart, B., Moller, S., and Herndon, E.† (2022) Effects of C:Mn ratios on sorption and oxidative degradation of small organic molecules on Mn-oxides. *Environ. Sci. Technol.* 57(1), 741-750. <https://doi.org/10.1021/acs.est.2c03633>
12. Sulman, B., Yuan, F., O'Meara, T., Gu, B., Herndon, E., Zheng, J., Thornton, P., and Graham, D. (2022) Simulated hydrological dynamics and coupled iron redox cycling impact methane production in an Arctic soil. *Journal of Geophysical Research Biogeosciences* 127(10), e2021JG006662. <https://doi.org/10.1029/2021JG006662>
13. Patzner, M., Kainz, N., Lundin, E., Barczok, M., Smith, C., Herndon, E., Kinsman-Costello, L., Fischer, S., Straub, D., Kleindienst, S., Kappler, A., and Bryce, C.† (2022) Seasonal fluctuations in iron cycling in thawing permafrost peatlands. *Environmental Science & Technology* 56, 4620-4631. <https://doi.org/10.1021/acs.est.1c06937>
14. Li, H.\*, Santos, F.\*, Butler, K.\*, and Herndon, E.† (2021) A critical review on the multiple roles of manganese in stabilizing and destabilizing soil organic matter. *Environ. Sci. Technol.* 55(18), 12136-12152. <https://doi.org/10.1021/acs.est.1c00299>
15. Kruse, S. \*, Rosenfeld, C., and Herndon E.† (2021) Manganese uptake by red maples in response to mineral dissolution rates in soil. *Biogeochemistry* 155, 147-168. <https://doi.org/10.1007/s10533-021-00817-4>
16. Eckert, P., Johs, A., Semrau, J. D., DiSpirito, A. A., Richardson, J., Sarangi, R., Herndon, E., Gu, B., and Pierce, E.† (2021) Spectroscopic and computational investigations of organometallic complexation of Group 12 transition metals by methanobactins from *Methylocystis* sp. SB2. *Journal of Inorganic Biochemistry*. <https://doi.org/10.1016/j.jinorgbio.2021.111496>
17. Yazbek, L.\*, Cole, K., Shedleski, A., Singer, D., and Herndon, E.† (2021) Hydrogeochemical processes limiting Fe export in a headwater catchment impaired by acid mine drainage. *ACS ES&T Water* 1(1), 68 – 78. [doi.org/10.1021/acsestwater.0c00002](https://doi.org/10.1021/acsestwater.0c00002)

18. Chowdhury, M. A. R., Herndon, E., and Singer, D.<sup>†</sup> (2021) Colloidal metal transport in soils developing on historic coal mine spoil. *Applied Geochemistry* 128, 104933. <https://doi.org/10.1016/j.apgeochem.2021.104933>
19. Singer, D. M.<sup>†</sup>, Herndon, E., Zemanek, L., Cole, K., Sanda, T.G., Senko, J., and Perdrial, N. (2021) Biogeochemical controls on the potential for long-term contaminant leaching from soils developing on historic coal mine spoil. *Soil Systems* 5(1), 3. <https://doi.org/10.3390/soilsystems5010003>
20. Herndon E. M.<sup>†</sup>, Kinsman-Costello L., Di Domenico N.\* , Duroe K.\* , Barczok M.\* , Smith C., and Wullschleger S. D. (2020) Iron and iron-bound phosphate accumulate in surface soils of ice-wedge polygons in arctic tundra. *Environmental Science: Processes & Impacts* 22, 1475 – 1490. <https://doi.org/10.1039/D0EM00142B>.
21. Shaw M.\* , Yazbek L.\* , Singer D., Herndon E.<sup>†</sup> (2020) Seasonal mixing from intermittent flow drives concentration-discharge (C-Q) behavior in a stream affected by coal mine drainage. *Hydrological Processes* 34(17), 3669-3682. <https://doi.org/10.1002/hyp.13822>
22. Singer D.<sup>†</sup>, Herndon E., Cole K., Koval J., Perdrial N. (2020) Formation of secondary mineral coatings and the persistence of reduced metal-bearing phases in soils developing on historic coal mine spoil. *Applied Geochemistry* 121, p. 104711. <https://doi.org/10.1016/j.apgeochem.2020.104711>
23. Singer D.<sup>†</sup>, Herndon E., Cole K., Burkey M., Morrison S., Cahill M., Bartucci M. (2020) Micron-scale distribution controls metal(loid) release during simulated weathering of a Pennsylvanian coal shale. *Geochim. Cosmochim. Acta* 269, 117 – 135. <https://doi.org/10.1016/j.gca.2019.10.034>
24. Herndon E.<sup>†</sup>, Yarger, B.\* , Frederick, H.\* , and Singer, D. (2019) Iron and manganese biogeochemistry in forested coal mine spoil. *Soil Systems* 3(1), 13. <https://doi.org/10.3390/soilsystems3010013>
25. Herndon E.<sup>†</sup>, Kinsman-Costello L., Duroe K.\* , Mills J.\* , Kane E., Sebestyen S., Thompson A., and Wullschleger S. (2019) Iron (oxyhydr)oxides serve as phosphate traps in tundra and boreal peat soils. *Journal of Geophysical Research Biogeosciences* 124(2), 227 – 246. <https://doi.org/10.1029/2018JG004776>
26. Brantley S.<sup>†</sup>, White T., West N., Williams J., Forsythe B., Shapich D., Kaye J., Lin H., Shi Y., Kaye M., Herndon E., Davis K., He Y., Eissenstat D., Weitzman J., DiBiase R., Li L., Reed W., Brubaker K., and Gu X. (2018) Susquehanna Shale Hills Critical Zone Observatory: Shale Hills in the Context of Shaver’s Creek Watershed. *Vadose Zone Journal* 17(1), 1 – 19. [doi:10.2136/vzj2018.04.0092](https://doi.org/10.2136/vzj2018.04.0092)
27. Sak P.<sup>†</sup>, Murphy M., Ma, L., Gaillardet J., Herndon E., Brantley S., and Daniel C. (2018) From unweathered core to regolith in a single weathering andesitic clast: rates and trends of in situ chemical weathering on a tropical volcanic island (Basse Terre Island, French Guadeloupe). *Chemical Geology* 498, 17 – 30. [doi.org/10.1016/j.chemgeo.2018.08.015](https://doi.org/10.1016/j.chemgeo.2018.08.015)
28. Herndon E.<sup>†</sup>, Steinhöfel G., Dere ALD, and P. Sullivan (2018) Perennial flow through convergent hillslopes explains chemodynamic solute behavior in a shale headwater catchment. *Chemical Geology* 493, 413-425. [doi.org/10.1016/j.chemgeo.2018.06.019](https://doi.org/10.1016/j.chemgeo.2018.06.019)
29. Herndon EM<sup>†</sup>, Havig JR, Singer DM, McCormick M, and LR Kump (2018) Manganese and iron geochemistry in sediments underlying the redox-stratified Fayetteville Green Lake. *Geochimica et Cosmochimica Acta* 231, 50-63. [doi.org/10.1016/j.gca.2018.04.013](https://doi.org/10.1016/j.gca.2018.04.013)
30. Herndon EM<sup>†</sup>, AlBashaireh AB\*, Singer DM, Roy Chowdhury T, Gu B, Graham DE (2017) Influence of iron redox cycling on organo-mineral associations in Arctic tundra soil. *Geochimica et Cosmochimica Acta* 207, 210-231. [doi.org/10.1016/j.gca.2017.02.034](https://doi.org/10.1016/j.gca.2017.02.034)
31. Chambers LG<sup>†</sup>, Chin Y, Filippelli GM, Gardner CB, Herndon EM, Long DT, Lyons WB, Macpherson GL, McElmurry SP, McLean CE, Moore J, Moyer RP, Nezat CA, Soderberg K, Teutsch N, and E Widom (2016) Developing the scientific framework for urban geochemistry. *Applied Geochemistry* 67, 1-20. [doi:10.1016/j.apgeochem.2016.01.005](https://doi.org/10.1016/j.apgeochem.2016.01.005)
32. Herndon EM, Yang Z, Bargar J, Janot N, Regier T, Graham D, Wullschleger S, Gu B, and Liang L<sup>†</sup> (2015) Geochemical drivers of organic matter decomposition in Arctic tundra soils. *Biogeochemistry* 126(3), 397-414. [doi:10.1007/s10533-015-0165-5](https://doi.org/10.1007/s10533-015-0165-5)

33. Herndon EM, Mann BF, Roy Chowdhury T, Yang Z, Graham DE, Wulfschleger SD, Liang L, and Gu B<sup>†</sup> (2015) Pathways of anaerobic organic matter decomposition in tundra soils from Barrow, Alaska. *Journal of Geophysical Research – Biogeosciences* 120, 2345-2359. doi:10.1002/2015JG003147
34. Herndon EM, Dere AL, Sullivan PL, Norris D, Reynolds B, and Brantley SL<sup>†</sup> (2015) Landscape heterogeneity drives contrasting concentration-discharge relationships in shale headwater catchments. *Hydrology and Earth Systems Science* 19, 3333-3347. doi:10.5194/hess-19-3333-2015
35. Mann BF, Chen H, Herndon EM, Chu RK, Tolic N, Portier E, Roy Chowdhury T, Robinson EW, Callister SJ, Wulfschleger SD, Graham D, Liang L, and Gu B<sup>†</sup> (2015) High-resolution molecular profiling of permafrost soil organic carbon composition and degradation under warming. *PloS One* 10(6), e0130557. DOI: 10.1371/journal.pone.0130557
36. Herndon EM, Jin L, Andrews DM, Eissenstat DM, and Brantley SL<sup>†</sup> (2015) Importance of vegetation for manganese cycling in temperate forested watersheds. *Global Biogeochemical Cycles* 29(2), 160-174. DOI: 10.1002/2014GB004858
37. Newman BD<sup>†</sup>, Throckmorton HM, Graham DE, Gu B, Hubbard SS, Liang L, Wu Y, Heikoop JM, Herndon EM, Phelps TJ, Wilson CJ, and Wulfschleger SD (2015) Microtopographic and depth controls on active layer chemistry in Arctic polygonal ground. *Geophys. Res. Lett.* 42, 1808-1817. DOI: 10.1002/2014GL062804
38. Kraepiel A<sup>†</sup>, Dere AL, Herndon EM and Brantley SL (2015) Natural and anthropogenic processes contributing to metal enrichment in surface soils of central Pennsylvania. *Biogeochemistry* 123, 265-283. DOI: 10.1007/s10533-015-0068-5
39. Roy Chowdhury T, Herndon EM, Phelps TJ, Elias DA, Gu B, Liang L, Wulfschleger S, and Graham DE<sup>†</sup> (2015) Stoichiometry and temperature sensitivity of methanogenesis and CO<sub>2</sub> production from saturated polygonal tundra in Barrow, Alaska. *Global Change Biology* 21(2), 722-737. DOI: 10.1111/gcb.12762
40. Herndon EM, Martínez CE, and Brantley SL<sup>†</sup> (2014) Spectroscopic (XANES/XRF) characterization of contaminant manganese cycling in a temperate watershed. *Biogeochemistry* 121, 505-517. DOI: 10.1007/s10533-014-0018-7
41. Ma L, Konter J, Herndon E, Jin L, Steinhofel G, Sanchez D, and Brantley SL<sup>†</sup> (2014) Quantifying an early signature of the industrial revolution from lead concentrations and isotopes in soils of Pennsylvania, USA. *Anthropocene* 7, 16-29. doi:10.1016/j.ancene.2014.12.003
42. Herndon EM and Brantley SL<sup>†</sup> (2011) Movement of manganese contamination through the Critical Zone. *Appl. Geochem* 26, S40-S43. doi:10.1016/j.apgeochem.2011.03.024
43. Brantley SL<sup>†</sup>, Megonigal JP, Scatena FN, Balogh-Brunstad Z, Barnes RT, Bruns MA, Van Cappellen P, Dontsova K, Hartnett HE, Hartshorn AS, Heimsath A, Herndon E, Jin L, Keller CK, Leake JR, McDowell WH, Meinzer FC, Mozdzer TJ, Petsch S, Pett-Ridge J, Pregitzer KS, Raymond PA, Reibe CS, Shumaker K, Sutton-Grier A, Walter R, and Yoo K (2011) Twelve testable hypotheses on the geobiology of weathering. *Geobiology* 9(2), 140-165. 10.1111/j.1472-4669.2010.00264.x
44. Herndon EM, Jin L, and Brantley SL<sup>†</sup> (2011) Soils reveal widespread manganese enrichment from industrial inputs. *Environ. Sci. Technol.* 45(1), 241-247. DOI: 10.1021/es102001w

### Book Chapters

1. Herndon E.<sup>†</sup>, Newcomer, M., Ma, L., and Shiller, A. (2024, *in press*) Trace elements and their isotopes in streams and rivers. In *Treatise on Geochemistry Volume 3. Invited and peer-reviewed*
2. Herndon E.<sup>†</sup>, Kinsman-Costello L., and S. Godsey (2020) Biogeochemical cycling of redox-sensitive elements in permafrost-affected ecosystems. In "Biogeochemical cycles: Ecological Drivers and Environmental Impacts." K. Dontsova, Z. Balogh-Brunstad, G. Le Roux (eds). John Wiley and Sons, Inc. *Invited and peer-reviewed.* <https://doi.org/10.1002/9781119413332.ch12>

### Editor-reviewed Publications

1. Kumar, P., Herndon, E., and Richter, D. (2020) Critical agents of change at Earth's surface. *Eos*, 101, <https://doi.org/10.1029/2020EO149750>.

2. Herndon, E.M. (2018) News and Views: Permafrost slowly exhales methane. *Nature Climate Change* 8, 273-274. doi:10.1038/s41558-018-0129-6. *Invited*.
3. Herndon, E.M. (2016) Perspectives: Tips to help chemists achieve a work-life balance. *Chemical and Engineering News* 94(27): 30-31. *Invited*.

### **Published Datasets**

- Sulman, Benjamin, and Herndon, Elizabeth. Model output from simulations of manganese-carbon interactions in temperate forest soil profiles. United States: N. p., 2024. Web. doi:10.15485/2324642.
- Newcomer, M., Herndon, E., Ma, L., and Shiller, A. (2023) Dataset for Book Chapter: Trace Elements and their Isotopes in Streams and Rivers. DOI: 10.5281/zenodo.8244823.
- Herndon E, Kinsman-Costello L, Di-Domenico N, Duroe K, Barczok M, Wullschleger CS. (2020) Iron and Phosphorus Geochemistry in High-Centered and Low-Centered Polygon Soils from the Barrow Environmental Observatory, Utqiagvik, Alaska, 2015. Next Generation Ecosystem Experiments Arctic Data Collection. Oak Ridge National Laboratory, U.S. Department of Energy, Oak Ridge, Tennessee, USA. DOI: 10.5440/1618325
- Zheng, J., Roy Chowdhury, T., Herndon, E., Yang, Z., Gu, B., Wullschleger, S., and Graham, D. (2018) Synthesis of soil geochemical characteristics and organic carbon degradation in Arctic polygon tundra, Barrow, Alaska. DOI: 10.5440/1440029
- Herndon, E., Yang, Z., and Gu, B. (2017) Soil organic carbon degradation during incubation, Barrow, Alaska. DOI: 10.5440/1168922
- Graham, D., Gu, B., Herndon, E., Wullschleger, S., Yang, Z., and Liang, L. (2016) Surface and active layer pore water chemistry from ice wedge polygons, Barrow, Alaska (2013-2014). DOI: 10.5440/1226245
- Roy Chowdhury T, Herndon E, Graham D, Gu B, Liang L (2013) Soil physicochemical characteristics from low-centered polygon in Barrow, Alaska. DOI: 10.5440/1109232.
- Susquehanna Shale Hills Critical Zone Observatory Stream Water Chemistry (2008-2010). EarthChem. [DOI: 10.1594/IEDA/100241; DOI: 10.1594/IEDA/100242; DOI: 10.1594/IEDA/100243]
- Susquehanna Shale Hills Critical Zone Observatory Porewater Chemistry (2008-2010). EarthChem. [DOI: 10.1594/IEDA/100235; DOI: 10.1594/IEDA/100236; DOI: 10.1594/IEDA/100237]

### **Research Grants**

#### **Active Research Grants**

- |             |  |
|-------------|--|
| 2022 – 2027 | Biogeochemical controls on phosphorus cycling in urban-influenced coastal ecosystems<br>PI: Elizabeth Herndon (ORNL)<br>Funding Agency: Department of Energy/Early Career Research Program<br>Amount: \$2.5M   |
| 2023 – 2026 | Watershed Dynamics and Evolution (WaDE) Science Focus Area<br>PI: Eric Pierce<br>Senior Personnel: Elizabeth Herndon (co-deputy PI), Marie Kurz (co-deputy PI), Scott Brooks, Natalie Griffiths, Alex Johs, Scott Painter, Mircea Podar, Melissa Cregger<br>Funding Agency: DOE/Environmental Systems Science<br>Amount: \$3.7M/year |

2019 – 2024 Collaborative Proposal: Biological and geochemical controls on phosphorus bioavailability in arctic tundra  
PI: Elizabeth Herndon (ORNL/UTK)  
Co-Is: Lauren Kinsman-Costello (Kent State); Michael Weintraub (U. of Toledo)  
Funding Agency: National Science Foundation: OPP/Arctic Natural Sciences  
Amount to UTK: \$907,462

### Completed Research Grants

2021 – 2022 LDRD: Linking Genes to Ecosystems with Phytoliths  
PI: Natalie Griffiths (ORNL)  
Co-Is: Xiaohan Yang, Stanton Martin, Wellington Muchero, Elizabeth Herndon, Madhavi Martin  
Funding Agency: ORNL/Laboratory Directed R & D  
Amount: \$1.0 M

2020 – 2022 Geochemical Regulation of Ecosystem Carbon Storage  
PI: Elizabeth Herndon (ORNL)  
Funding Agency: ORNL/Laboratory Directed R & D  
Amount: \$1,191,400

2018 – 2019 CAREER: Manganese biogeochemistry and impacts on carbon storage in plant-soil systems  
PI: Elizabeth Herndon (Kent State)  
Funding Agency: National Science Foundation: EAR/Geobiology and Low-Temperature Geochemistry  
Amount to KSU: \$487,222 (amended to \$112,143 following move to UT/ORNL)

2018 – 2019 Designing a sensor network to investigate how redox regimes control iron and phosphorus biogeochemistry  
PI: Elizabeth Herndon  
Co-PI: Lauren Kinsman-Costello  
Funding Agency: KSU/Environmental Science and Design Research Initiative  
Amount: \$12,000

2018 – 2019 Colloid generation and transport in stream sediments impacted by acid mine drainage  
PI: Elizabeth Herndon  
Funding Agency: Kent State University, University Research Council  
Amount: \$3,425

2016 – 2018 Iron geochemistry and controls on phosphorus bioavailability in northern peatlands  
PI: Elizabeth Herndon

Co-I: Lauren Kinsman-Costello  
Funding Agency: National Science Foundation: EAR/Geobiology and Low-Temperature Geochemistry  
Amount to KSU: \$100,567

2017 – 2018 Acquisition of an X-ray diffractometer for environmental mineralogy and geochemistry  
PI: David Singer (Kent State)  
Co-Is: Elizabeth Herndon, Jeremy Williams  
Funding Agency: National Science Foundation: EAR/Instrumentation & Facilities  
Amount to KSU: \$126,459

2017 – 2018 Concentration-discharge behavior of dissolved and particulate metals in a mining impacted stream  
PI: Elizabeth Herndon (Kent State)  
Funding Agency: Ohio Water Resources Center (OWDA)  
Amount to KSU: \$63,096 (50% cost-shared)

2017 – 2018 Impacts of manganese cycling on carbon storage in plant-soil systems  
PI: Elizabeth Herndon  
Funding Agency: Kent State University, University Research Council  
Amount: \$9,538

2015 – 2018 Impact of vegetation on metal release from soils developed on coal mine waste  
PI: Elizabeth Herndon  
Funding Agency: Kent State University, Farris Family Innovation Award  
Amount: \$24,000

2015 Evaluating the impact of vegetation on water and metal transport through coal mine waste  
PI: Elizabeth Herndon  
Funding Agency: Kent State University, University Research Council  
Amount: \$2,469

2014 Investigating inorganic and organic-mediated cation transport from soils to streams  
PI: Elizabeth Herndon  
Funding Agency: National Science Foundation/Penn State University  
Amount to KSU: \$9,902

**User Proposals Awarded (PI or mentee-led)**

*USGS Powell Center Working Group (2024 – 2026)*

Defining subsidy-stress gradients for metals and relevance for US surface waters; PI David Costello;

Co-Is Elizabeth Herndon, Travis Schmidt, Angela Peace.

*Advanced Photon Source, Argonne National Laboratory*

Beamline 9-BM: GUP #75481 (3/2022, 12 shifts; PI Avasarala)  
Beamline 12-BM-B: GUP #74170 (9/2021, 6 shifts; 10/2021, 9 shifts; PI Li); GUP #65877 (11/2019, 9 shifts; PI Barczok); GUP #60689 (10/2018, 9 shifts); GUP #54760 (3/2018, 12 shifts)  
Beamline 13-ID-E: GUP #41616 (02/2015, 9 shifts); GUP #45047 (12/2015, 9 shifts); GUP #26055 (10/2011, 9 shifts)  
Beamline 13-BM-D, GUP 22644 (10/2010)  
Beamline 20-BM-XOR, GUP 11893 (08/2009)

#### *Canadian Light Source*

Beamline SGM: Proposal 11580 (3/2021, 6 shifts; 1/2022, 12 shifts; PI Li)  
Beamline SXRMB: Proposal 11742 (1/2022, 6 shifts; PI Avasarala), Proposal 9919 (12/2019, 9 shifts)

#### *Environmental Molecular Sciences Laboratory*

Exploratory Project 60557 (12/1/2022 – 9/30/2023, PI Rooney)

#### *National Synchrotron Lightsource II, Brookhaven National Laboratory*

Beamline 6-BM: GU #307193 (7/2021, 9 shifts, PI Li)  
Beamline 7-ID-1: GU #307193 (12/2020, 6 shifts; 7/2021, 3 shifts, PI Li)

#### *Spallation Neutron Source*

Beamline 6 EQ-SANS: IPTS #31378.1 (2/2023, 4 days, PI Bidas)

#### *Stanford Synchrotron Lightsource*

Beamline 14-3: S-XV-ST-5853 (7/2021 – 6/2022; 36 shifts)

## **Presentations**

### **Invited Seminars**

- 2024 Washington University in Saint Louis, Dept. of Earth, Environmental, and Planetary Sciences
- 2023 Workshop on Iron Biogeochemistry, Lech, Austria  
GFZ Interfacial Geochemistry group, Helmholtz-Zentrum Potsdam  
United States Geological Survey, SynerGEM Seminar
- 2022 Oak Ridge National Laboratory, ORPA Postdoc Appreciation Week, Keynote
- 2021 The University of Mississippi, Department of Geology and Geological Engineering
- 2020 The University of Tennessee Knoxville, Department of Earth and Planetary Sciences  
Oak Ridge National Laboratory, ORPA Research Seminar Series
- 2019 Oak Ridge National Laboratory, Energy Talks  
Kent State University, Environmental Science and Design Research Symposium  
Kent State University, Department of Physics
- 2018 Stockholm University, Department of Geological Sciences
- 2017 Cleveland State University, Department of Biological, Geological, and Environmental Sciences
- 2016 Ohio State University, Department of Earth Sciences  
Kent State University, Kent State Environmental Society  
Case Western Reserve University, Dept. of Earth, Environmental and Planetary Sciences
- 2015 Kent State University, Kent State Biological Sciences  
Smithsonian Institution, National Museum of Natural History; Mineral Sciences Division  
Towson University; Department of Physics, Astronomy and Geosciences
- 2013 The Pennsylvania State University; Dept. of Geosciences, *Peter Deines Memorial Lecture*

### **Conference Presentations**



- 2024 Herndon, E., Costello, D., Schmidt, T., and Peace, A. (2024) Defining subsidy-stress gradients for metals and relevance for US surface waters. *Critical Zone Network All-Hands meeting*. (invited oral presentation).
- Herndon, E., Berens, M., Schwaner, G., McDevitt, G., Rovai, A., and Twilley, R. (2024) Redox response to hydrologic variability in an aggrading coastal delta. *Environmental System Science PI Meeting*, Reston, VA (poster).
- Herndon, E., Fettrow, S., Murphy, B., Salmon, V., Sulman, B., and Graham, D. (2024) Scaling observations of carbon dynamics across the thawing tundra. *Environmental System Science PI Meeting*, Reston, VA (oral presentation, breakout session).
- 2023 Herndon, E., Barczok, M., Rooney, E., Berens, M., Smith, C., VanderJeugd, E., Miah, I., Kinsman-Costello, L., and Weintraub, M. (2023) Influence of soil structure on redox dynamics in variably inundated environments. *ASA-CSSA-SSSA International Annual Meeting*, Saint Louis, MO. *Invited symposium speaker*.
- Herndon, E., Bidas, K. Li, H., Santos, F., and Sulman, B. (2023) The roles of manganese in stabilizing and destabilizing soil organic matter. *V.M. Goldschmidt conference*, Lyon, France. *Invited keynote*.
- Herndon, E., Berens, M., Wang, C., Schwaner, G., Rovai, A., and Twilley, R. (2023) Biogeochemical processes regulating nutrient solubility in a freshwater coastal delta. *Environmental System Science PI Meeting*, Bethesda, MD (poster).
- 2022 Herndon, E., Santos, F., Li, H. (2022) Litter transformations during decomposition as a function of warming and manganese addition. *American Geophysical Union Fall Meeting*, Chicago, IL. Oral.
- Herndon, E., Rooney, E., Avasarala, S., VanderJeugd, E., Kinsman-Costello, L., and Weintraub, M. (2022) Redox biogeochemistry in the Arctic tundra. Virtual Workshop: Chemical Processing Across Scales at Land-Atmosphere Interfaces. Hosted by EMSL and ARM. *Invited oral presentation*.
- Herndon, E.\*, Richardson, J., Weston, D.\*, Carrell, A., and Pierce, E. (2022) Insights into the *Sphagnum* moss – cyanobacteria symbiosis and possible role for sulfur metabolism. 2022 SSRL/LCLS Users' Meeting. Virtual. *Invited oral presentation*. (\*co-presenters)
- Herndon, E., Santos, F., Li, H., and Reinhart, B. (2022) Manganese redox transformation and associated organic matter degradation during leaf litter decomposition. *American Chemical Society*, Chicago, IL. Oral.
- 2021 Herndon, E., Santos, F., and Li, H. (2021) Spectroscopic investigation of manganese and carbon transformation during litter decomposition. *American Geophysical Union Fall Meeting*, Virtual/New Orleans, LA. Poster.
- Herndon, E., Li, H., Santos, F., Butler, K. (2021) The multiple roles of manganese in stabilizing or destabilizing soil organic matter. *ASA-CSSA-SSSA International Annual Meeting*, Virtual/Salt Lake City, UT. Oral.
- Herndon, E., O'Meara, T., Sulman, B., Berns, E., and Graham, D. (2021) Effects of dynamic soil moisture on soil redox potential and biogeochemical processes. DOE Environmental System Science PI meeting, flash talk.
- Herndon, E., Kinsman-Costello, L., Di Domenico, N., Duroe, K., Barczok, M., Smith, C., and Wullschleger, S. (2021) Iron and iron-bound phosphate accumulate in surface soils of ice-wedge polygons in Arctic tundra. DOE Environmental System Science PI meeting, poster for NGEE-Arctic.
- Herndon E., and Sulman B. (2021) Modeling interactive effects of Mn, N, and warming on soil carbon storage. *31<sup>st</sup> V. M. Goldschmidt conference (virtual)*.
- 2020 Herndon, E. M., Kinsman-Costello, L., Michaud, A., Emerson, D., Bowden, W. (2020) X-ray vision in the arctic tundra: exploring how redox biogeochemistry influences ecosystem processes. *30<sup>th</sup> V. M. Goldschmidt conference (virtual)*, *Keynote*.

- Herndon, E.M., Laubscher, S., Sulman, B., and Rosenfeld, C. (2020) Effects of biological manganese cycling on carbon storage in the critical zone. *30<sup>th</sup> V. M. Goldschmidt conference (virtual)*, *Invited*.
- 2019 Herndon, E.M., Laubscher, S., and Rosenfeld, C. (2019) Manganese cycling and associated impacts on carbon storage in plant-soil systems. *ASA-CSSA-SSSA International Annual Meeting*, San Antonio, TX. *Invited*.
- Herndon, E.M. (2019) Iron oxides as carbon and nutrient traps in soils. *Toolik Field Station All Scientists Meeting*, Portland, OR. *Invited*.
- Herndon, E.M. (2019) Manganese mobilization from forested soils developed on coalmine waste. *Soil Science Society of America meeting*, San Diego, CA. *Invited*.
- 2018 Herndon, E.M., Barczok, M., Thompson, A., Kinsman-Costello, L., and Smith C. (2018) Iron speciation across redox regimes in arctic tundra soil. *American Geophysical Union Fall Meeting B31G-2575*, Washington D.C.
- Herndon, E.M., Duroe, K., Kinsman-Costello, L., Mills, J., Thompson, A., Kane, E., Sebestyen, S., and Wullschleger, S. (2018) Iron accumulation promotes phosphate retention at redox interfaces in arctic and boreal soils. *28<sup>th</sup> V.M. Goldschmidt conference*, Boston, MA. *Invited*.
- Herndon E.M. (2018) Iron geochemistry and controls on phosphorus bioavailability in tundra and boreal soils. *Iron Geochemistry Workshop*, Lech, Austria. *Invited*.
- 2017 Herndon, E.M., Steinhofel, G., Dere, A.L.D., Sullivan, P.L. (2017) Perennial flow through convergent hillslopes explains chemodynamic solute behavior in a shale headwater catchment. *American Geophysical Union Fall Meeting B54A-02*, New Orleans, LA, USA
- Herndon, E.M., Duroe, K., Mills, J., Kinsman-Costello, L., Wullschleger, S., Sebestyen, S., Kane, E. (2017) Iron-phosphorus interactions across redox transitions in tundra and boreal wetlands. *27<sup>th</sup> V.M. Goldschmidt conference*, Paris, France.
- 2016 Herndon, E.M., AlBashaireh A., Duroe, K., Singer, D. (2016) Influence of iron redox cycling on organo-mineral associations in arctic tundra soils. *American Geophysical Union Fall Meeting B41D-0458*, San Francisco, CA, USA.
- Herndon E.M., Havig, J., Singer, D., McCormick, M., Kump, L. (2016, *invited*) Investigating Fe and Mn geochemistry in sediments of a redox-stratified lake. *Geological Society of America Fall Meeting 93-7*, Denver, CO, USA.
- Herndon E.M., Steinhofel, G., Dere A.L.D. (2016) Investigating inorganic and organic solute transport in the Shale Hills catchment. *Susquehanna Shale Hills CZO All Hands Meeting*, State College, Pennsylvania, USA.
- Herndon E.M., Singer, D.M., and Zemanek, L. (2016) Metal(loid) leaching from soils developing on coal mine waste. *American Chemical Society Spring Meeting*, San Diego, CA, USA.
- 2015 Herndon E.M. (2015) Importance of vegetation for manganese cycling in forested watersheds. *Geological Society of America Fall Meeting 172-4*, Baltimore, MD, USA.
- Herndon E.M., Roy Chowdhury T., Yang Z., Graham D., Gu B., and Liang L. (2015) Iron biogeochemistry in arctic tundra soils. *25<sup>th</sup> V.M. Goldschmidt conference*, Prague, Czech Republic.
- 2014 Herndon E.M., Roy Chowdhury T., Mann B., Graham D., Wullschleger S.D., Gu B., Liang L. (2014) Geochemical drivers of anaerobic organic matter decomposition in the active layer of arctic tundra. *AGU Fall Meeting GC11B-0554*, San Francisco, CA, USA.
- Herndon E.M., Roy Chowdhury T., Mann B., Graham D., Wullschleger S.D., Gu B., Liang L. (2014) Geochemical drivers of anaerobic organic matter degradation in Arctic tundra. *24<sup>th</sup> V.M. Goldschmidt conference*, Sacramento, CA, USA.
- 2013 Herndon E.M., Roy Chowdhury T., Mann B., Graham D., Bargar J., Gu B., Liang L. (2013) Chemical and spectroscopic analyses of organic matter transformation in warming tundra soils. *AGU Fall 2013*.

- 2012 Herndon E.M., Kubicki J. and Brantley S.L. (2012) Micro- to macro-scale investigations of manganese in soil-plant systems. *22nd V.M. Goldschmidt conference*, Montreal, Canada.
- 2011 Herndon E.M., Eissenstat D., Martinez C.E., and Brantley S.L. (2011, oral) Biogeochemical characterization of contaminant Mn sequestration. *21st V.M. Goldschmidt conference*, Prague, Czech Republic.
- Herndon, E.M., and Brantley, S.L. (2011, poster) Movement of manganese contamination through the Critical Zone. *Geochemistry of the Earth's Surface (GES-9)*, Boulder, CO, USA. \*IAGC Faure Award for best student presentation
- 2010 Brantley S.L., Herndon E.M., Jin L., Eissenstat D., Raymond P. (2010, *invited*) Vegetation: A natural capacitor for contaminant metals input into the Critical Zone. *EOS Trans. AGU 91*, Fall Meet. Suppl., Abstract B23K-01.
- 2010 Herndon E.M. and Brantley S.L. (2010, *poster*) Role of biotic cycling in determining the soil residence time of industrial pollutants. *20th V.M. Goldschmidt conference*, Knoxville, TN.
- 2009 Herndon E.M., Jin L., and Brantley S.L. (2009, *poster*) Impact of aeolian deposition on Mn cycling in soils. *19th V.M. Goldschmidt conference*, Davos, Switzerland.
- 2008 Herndon E.M., Jin L., and Brantley S.L. (2008, *poster*) Mn enrichment in surface soils: a signal for dust? *EOS Trans. AGU 89(53)*, Fall Meet. Suppl., Abstract A43A-0278.

### Advisee-led Conference Presentations

- 2023 Rooney, E., VanderJeugd, E., Avasarala, S., Miah, I., Berens, M., Kinsman-Costello, L., Weintraub, M., and Herndon, E. (2023) Decoupling of redox processes with soil saturation in arctic tundra. *ASA-CSSA-SSSA International Annual Meeting*, Saint Louis, MO. *Invited symposium speaker.*
- Bidas, K., Rooney, E., Kinsman-Costello, L., Weintraub, M., Zhao, Q. (2023) Interactions between organic carbon and synthetic manganese and iron oxides in arctic tundra. *ASA-CSSA-SSSA International Annual Meeting*, Saint Louis, MO.
- Berens, M., Schwaner, G., Rovai, A., Twilley, R., and Herndon, E. (2023) Biogeochemical controls on nutrient solubility in an emerging freshwater coastal delta. *ASA-CSSA-SSSA International Annual Meeting*, Saint Louis, MO.
- 2022 Santos, F. and Herndon, E. (2022) Interactive Effects of Nitrogen and Manganese Availability and Temperature on Losses of Carbon and Nitrogen from Leaves. *American Geophysical Union Fall Meeting*, Chicago, IL, B22H-1545.
- Rooney, E., Avasarala, S., VanderJeugd, E., Miah, I., Kinsman-Costello, L., Weintraub, M., and Herndon, E. (2022) Redox conditions vary with depth in arctic tundra surface soils. *American Geophysical Union Fall Meeting*, Chicago, IL, B21A-01.
- Bidas, K., Li, H., Reinhart, B., and Herndon, E. (2022) Interactions between organic carbon and synthetic manganese and iron oxides in acidic forest soil. *American Geophysical Union Fall Meeting*, Chicago, IL, B22H-1549.
- 2021 Li, H., Reinhart, B., Herndon, E. (2021) Adsorption and oxidative degradation of organic compounds on structurally diverse Mn oxides. *ASA-CSSA-SSSA International Annual Meeting*, Virtual/Salt Lake City, UT. Oral.
- Santos, F. and Herndon, E. (2021) The influence of manganese availability and warming on CO<sub>2</sub> fluxes from soils during decomposition. *ASA-CSSA-SSSA International Annual Meeting*, Virtual/Salt Lake City, UT. Oral.
- Avasarala, S., VanderJeugd, E., Kinsman-Costello, L., Herndon, E. (2021) Effect of pH on interactions between Fe, peat soil, and phosphorus. *American Chemical Society Fall Meeting*, Atlanta, GA.
- Barczok M., Smith C., Kinsman-Costello L., Singer D., Patzner M., Kappler A., Bryce C., and Herndon E. (2021) Impact of increasing permafrost thaw and surface ponding on iron

- speciation and phosphorus bioavailability in Abisko, Sweden. *31<sup>st</sup> V. M. Goldschmidt conference*, virtual.
- 2020 Santos, F., and Herndon E. (2020) Climatic and edaphic influences of manganese and carbon interactions in plants and soils across biomes in the US. *American Geophysical Union Fall Meeting* (virtual), B104-01, *invited*.
- Di Domenico, N., Herndon, E., and Thornton, P. (2020) Identifying polygonal ground in arctic regions using GLCM texture features for support vector machine classification. *American Geophysical Union Fall Meeting* (virtual), B019-0012.
- Barczok, M., Smith, C., Kinsman-Costello, L., Singer, D. Herndon, E. (2020) Phosphorus bioavailability as a function of increasing permafrost thaw and surface ponding in Abisko, Sweden. *American Geophysical Union Fall Meeting* (virtual), B120-05.
- Barczok, M., Smith, C., Kinsman-Costello, L., Singer, D. and Herndon, E. (2020) Influence of permafrost thaw on redox, iron speciation, and bioavailable phosphorus in a subarctic peatland. *30<sup>th</sup> V. M. Goldschmidt conference*, virtual.
- Li, H. and Herndon, E. (2020) Role of Mn-oxides in regulating fate and transport of soil organic matter. *30<sup>th</sup> V. M. Goldschmidt conference*, virtual.
- Santos, F., Yan, J., Li, H., Herndon, E., Parikh, S., Ghezzehei, T., Blanchette, F., Bird, J., and Berhe, A. (2020) Mineralogical controls on the retention and chemical composition of dissolved pyrogenic carbon. *30<sup>th</sup> V. M. Goldschmidt conference*, virtual.
- Barczok, M., Smith, C., Kinsman-Costello, L., and Herndon, E. (2020) Iron (oxyhydr)oxide crystallinity and redox conditions as a function of permafrost thaw in Abisko, Sweden. *Environmental Science and Design Research Symposium* (Graduate poster award – 2<sup>nd</sup> place). Kent State University.
- 2019 Laubscher, S., and Herndon, E. (2019) Manganese dissolution kinetics and uptake rates by red maple trees in soils. *Environmental Science and Design Research Symposium* (Graduate poster award – 1<sup>st</sup> place) and *Graduate Research Symposium* (Graduate poster award – 1<sup>st</sup> place in division), Kent State University.
- Barczok, M., Smith, C., Kinsman-Costello, L., and Herndon E. (2019) Influence of iron (oxyhydr)oxide crystallinity on phosphate bioavailability in contrasting redox and hydrological conditions. *Environmental Science and Design Research Symposium* (Graduate poster award – 2<sup>nd</sup> place) and *Graduate Research Symposium*, Kent State University.
- Yazbek, L., Singer, D., Herndon, E. (2019) Metal speciation and transport in a stream impacted by coal mine drainage. *Environmental Science and Design Research Symposium and Graduate Research Symposium* (Graduate oral award – 1<sup>st</sup> place in division), Kent State University.
- Di Domenico, N., Barczok, M., and Herndon, E. (2019) Using sequential extractions to measure potentially bioavailable phosphate in soil systems with poorly crystalline iron-oxides. *Undergraduate Research Symposium* (Poster award – 1<sup>st</sup> place in division), Kent State University.
- Crowell, M., Laubscher, S., and Herndon, E. (2019) Optimizing Soil Grinding to Measure Soil Manganese Content. *Undergraduate Research Symposium*, Kent State University.
- 2018 Barczok, M., Smith, C., Kinsman-Costello, L., and Herndon E. (2018) Influence of iron (oxyhydr)oxide crystallinity on phosphorus bioavailability in fluctuating redox conditions. *American Geophysical Union Fall Meeting* B31G-2577, Washington D.C.
- Laubscher, S., and Herndon, E. (2018) Geochemical constraints on manganese uptake by red maple trees. *American Geophysical Union Fall Meeting*, Washington D.C.
- Yazbek, L., Singer, D., Herndon, E. (2018) Particle, nanoparticle, and dissolved metal speciation and transport in an acid mine drainage impacted system in Northeastern Ohio. *American Geophysical Union Fall Meeting*, Washington D.C.

- Shaw, M.E., Klein, M., and Herndon, E. (2018) Concentration-discharge behavior of contaminants in a stream impacted by acid mine drainage. 28<sup>th</sup> V.M. Goldschmidt conference, Boston, MA. *Graduate presenter.*
- Klein, M., Herndon, E. (2018) Developing a protocol for extracting mineral-associated organic matter in soils developed from coal mine waste. *Kent State Undergraduate Research Symposium*, Kent State University, Kent, OH. *Undergraduate presenter.*
- 2017 Shaw, M.E., Klein, M., and Herndon, E. (2017) Concentration-discharge behavior of contaminants in a stream impacted by acid mine drainage. *American Geophysical Union Fall Meeting*, New Orleans, LA, USA. *Graduate presenter.*
- Mills, J., Duroe, K., Kinsman-Costello, L., Herndon, E. (2017) Evaluating phosphorus solubility in tundra and boreal peatlands. *GSA Joint Northeastern/North Central Section Meeting*, Pittsburgh, PA, USA. *Undergraduate Poster Award – Honorable Mention*
- Frederick, H., Yarger, B., Herndon, E. (2017) Geochemical evaluation of weathering processes in coal mine spoil. *GSA Joint Northeastern/North Central Section Meeting*, Pittsburgh, PA, USA. *Best Undergraduate Poster Award.*
- Duroe, K., Mills, J., Kinsman-Costello, L., Herndon, E. (2017) Iron redox cycling and impacts on phosphorus solubility in tundra and boreal ecosystems. *GSA Joint Northeastern/North Central Section Meeting*, Pittsburgh, PA, USA. *Graduate presenter.*
- Yarger, B., Frederick, H., Zemanek, L., Singer, D., Herndon, E. (2017) Getting to the root of nonpoint source pollution in abandoned mine lands: biogeochemical cycling of manganese in forested coal mine spoil. *GSA Joint Northeastern/North Central Section Meeting*, Pittsburgh, PA, USA. *Graduate presenter.*
- Shaw, M. and Herndon, E. (2017) Investigation of trace metal transport in an AMD-impacted stream and treatment system in northeastern Ohio. *GSA Joint Northeastern/North Central Section Meeting*, Pittsburgh, PA, USA. *Graduate presenter.*
- 2016 Mills, J., Duroe, K., Kinsman-Costello, L., Herndon, E. (2016) Evaluating phosphorus bioavailability and sorption to iron oxyhydroxides in tundra and boreal peatlands. *Kent State Water and Land Symposium*, Kent State University, Kent OH. *Undergraduate presenter.*
- Frederick, H., Yarger, B., Herndon, E. (2016) Geochemical evaluation of weathering processes in coal mine spoil. *Kent State Water and Land Symposium*, Kent State University, Kent OH. *Undergraduate presenter.*
- Duroe, K., Mills, J., Wullschleger, S., Sebestyen, S., Kinsman-Costello, L., Herndon, E. (2016) Iron redox cycling and impacts on phosphorus solubility in tundra and boreal ecosystems. *Geological Society of America Fall Meeting 93-3*, Denver, CO, USA. *Graduate presenter.*
- Yarger, B., Frederick, H., Zemanek, L., Singer, D., Herndon, E. (2016) The impact of vegetation on manganese biogeochemistry in abandoned mine spoil. *Geological Society of America Fall Meeting 151-5*, Denver, CO, USA. *Graduate presenter.*
- 2015 AlBashaireh, A.B., Singer, D.M., and Herndon E.M. (2015) Geochemical analysis of iron and phosphorus in arctic tundra soils. *Geological Society of America Fall Meeting 210-85*, Baltimore, MD, USA. *Undergraduate presenter.*

## **Teaching and Mentoring**

### *Graduate/Advanced Undergraduate courses (Kent State University)*

Hydrogeochemistry	Fall 2014, 2016, 2018
Environmental Soil Science	Fall 2015, 2017
Critical Zone Processes	Spring 2019

### *Undergraduate and Core Courses (Kent State University)*

Environmental Earth Science	Fall 2016
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How the Earth Works	Spring 2016, 2017; Fall 2018
How the Earth Works – Distance learning	Fall 2017
Introductory Geology Seminar	Spring and Fall 2015
<i>Graduate/Advanced Undergraduate courses (Penn State University)</i>	
Techniques in Environmental Geochemistry	Fall 2012

### Postdoctoral Advisees

Holly Roth	Environmental Sciences Division, ORNL	2024 – present
Matthew Berens	Environmental Sciences Division, ORNL	2023 – present
Sean Fettrow	Environmental Sciences Division, ORNL	2023 – 2024
Erin Rooney	NSF Postdoc Fellow, E&PS, UT-Knoxville	2022 – 2023
Fernanda Santos	Environmental Sciences Division, ORNL	2020 – 2022
Sumant Avasarala	Earth & Planetary Sciences, UT-Knoxville	2020 – 2022
Hui Li	Environmental Sciences Division, ORNL	2019 – 2022

### Theses/Dissertations Advised

Kristen Bidas	Ph.D. Geology, University of Tennessee – Knoxville, <i>anticipated Spring 2025</i>
Max Barczok	Ph.D. Applied Geology, Kent State University, 2022 <i>Geochemical controls over phosphorus bioavailability as a function of redox sensitive iron oxides</i> (co-advised with Dr. David Singer)
Sydney Laubscher	M.S. Geology, Kent State University, 2019 <i>Manganese uptake in red maples in response to mineral dissolution rates in soil</i>
Kiersten Duroe	M.S. Geology, Kent State University, 2019 <i>Iron redox cycling and impacts of phosphorus solubility in tundra and boreal ecosystems</i>
Lindsey Yazbek	M.S., Geology, Kent State University, 2019 <i>Hydrogeochemical factors influencing metal transport and transformation in a stream impaired by acid mine drainage</i>
Meaghan Shaw	M.S., Geology, Kent State University; 2018 <i>Concentration-discharge behavior of contaminants in a stream impacted by acid mine drainage</i>
Hannah Frederick	B.S., Biochemistry/Honors Thesis, Kent State; 2017 <i>Geochemical evaluation of weathering processes and metal uptake by vegetation in coal mine spoil</i>

### Graduate Committee Membership

Imtiaz Miah	Ph.D. Biology (Ecology concentration), University of Toledo, <i>in progress</i>
Erin VanderJeugd	Ph.D. Biological Sciences, Kent State University, <i>in progress</i>
Hannah Rigoni	Ph.D. Earth and Planetary Sciences, UT-Knoxville, <i>in progress</i>
Isis Fukai	Ph.D. Energy Science and Engineering, UT-Knoxville, <i>in progress</i>
Jacob Perez	M.S. Earth and Planetary Sciences, UT-Knoxville, 2024
Chelsea Smith	Ph.D. Biological Sciences, Kent State University, 2023
Nicolle Di Domenico	M.S., Department of Geography, Penn State University, 2023
Maggie Limbeck	Ph.D. Earth and Planetary Sciences, UT-Knoxville, 2023
Ashleigh Montgomery	M.S. Biosystems Engineering and Soil Science, University of Tennessee, 2022
Raihan Chowdhury	Ph.D. Geology, Kent State University, 2022
Laura Zemanek	M.S. Geology, Kent State University, 2021
Taylor Judice	M.S. Geology, Kent State University, 2019
Hayley Buzulencia	M.S. Geology, Kent State University, 2019

Mary Plauche	M.S. Geology, Kent State University, 2019
Alescia Roberto	Ph.D. Biological Sciences, Kent State University, 2018
Dulci Avouris	Ph.D. Applied Geology, Kent State University, 2018
Daniel Wood	M.S. Geology, Kent State University, 2018
Laura Sugano	M.S. Geology, Kent State University, 2018
Eric Traub	M.S. Geology, Kent State University, 2016

### **Undergraduate/High School Laboratory Researchers and Assistants in the Herndon lab group**

ORNL (7):	Emily Willman (ECO, 2024), Ethan White (RSI, 2024), Vivian Gerstein (SULI, 2024), Brian Jimenez (SULI, 2024), Georgia Mcdevitt (SULI, 2023-2024), Kayla Summerlot (SULI, 2023), Josh Martinez (NGSI, 2023), Ethan Wetter (SULI, 2021 – 2022), Sophia McDuffee (SULI, 2021), Nicolle Di Domenico (HERE/SULI, 2020-2021; NSF 2021 GRFP Awardee)
Kent State (13):	Nicolle Di Domenico (2018 – 2019), Devin Starr (2019), Michael Crowell (2018 – 2019), Shannon Joseph (2018), Mallory Klein (2017 – 2018), Bryan Agee (2016 – 2017), Jonathan Mills (2016 – 2017), Hannah Frederick (2015 – 2017), Roman Waked (2016), Amineh AlBashaireh (2015/REU), Allison Reynolds (2015), Paul Panehal (2014 – 2015), Mitchell Ladig (2014)

### **Service Activities**

#### **Professional Service**

##### *Manuscript Reviewer (within past 2 years)*

Environmental Science and Technology; Geochimica et Cosmochimica Acta; New Phytologist; Global Biogeochemical Cycles; Science of the Total Environment; Hydrological Processes; Environmental Science: Processes and Impacts; Earth's Future; Soil Science Society of America Journal; Soil Biology and Biochemistry; Earth and Planetary Science Letters; ES&T Water; ES&T Nano

##### *Proposal Reviewer*

- NSF Panel Reviewer (three separate panels; 2014, 2015, 2019, 2021, 2023)
- DOE Ad-hoc reviewer (Environmental Systems Science)
- NSF Ad-hoc reviewer (Arctic Observation Network, Arctic Natural Sciences, Geobiology and Low-temperature Geochemistry, Division of Environmental Biology): 2014 – present
- Canadian Light Source Beamline Proposals, 2013 – present
- Stanford Synchrotron Light Source, *ad hoc*, 2015 – present

##### *Professional Society Service*

- Co-organizer for BER-sponsored Critical Knowledge Gaps for Coastal Systems: Research Priorities for the U.S. South Atlantic and Gulf of Mexico Workshop (2024)
- Associate Editor, Geochimica et Cosmochimica Acta (2021 – present)
- Geochemical Society Patterson Award, selection committee (2020 – 2022; chair in 2022)
- European Association of Geochemistry Science Innovation Award committee (2021-2022)
- Conference Mentor: Goldschmidt 2020, SSSA 2019
- Student presentation judge: most attended conferences
- Session convenor: Redox biogeochemistry and organo-mineral interactions in the thawing tundra, American Geophysical Union, Fall 2022
- Session convenor: Manganese biogeochemistry in natural and engineered environments, American Chemical Society, Fall 2022

- Session convener: Hydrobiogeochemical dynamics of subsurface interfaces, American Geophysical Union Fall Meeting 2021
- Session convener: Impacts of minerals and micronutrients in the biogeochemical cycling of soil organic carbon, Soil Science Society of America meeting, Fall 2021
- Session convener: Hydrobiogeochemical processes at the sediment-water interface: wetlands, river corridors and coastal zones, Goldschmidt Conference, 2021
- Previous sessions convened at Goldschmidt, AGU, SSSA, and American Chemical Society meetings

#### *Oak Ridge National Laboratory*

- Environmental Sciences Division Postdoc Round-Table Series; co-organizer; 2019 – 2022
- Committee for selecting Environmental Sciences Division Outstanding Post-Grad and Research Support Awards; 2020 – 2022
- Laboratory Directed Research and Development, IRC Panel; FY21 proposals

#### *Kent State University*

- Environmental Science and Design Research Symposium, Poster Session Chair, 2018 – 2019
- University Research Council, Reviewer for Summer Research Leave/Farris Award
- Hydrogeology faculty search committee, 2016 – 2017
- Water and Land Symposium organizing committee, 2016 – 2019
- Faculty Advisory Committee, 2016 – 2019
- Graduate studies committee, Kent State University, 2014 – 2017
- Coordinator, Palmer Lecture Series, Kent State University, 2014 – 2015

#### **Science Communication and Educational Outreach**

- Guest speaker on “The Best Paragraph I’ve Read” Podcast (October 6, 2022)
- Presentation to ARC/ORNL Summer STEM program (2020 – 2021)
- Presentation to SULI Lunch with a Researcher (2020)
- Interviewed for NPR WKSU Exploradio: [Cities Step Up to the Challenge of Climate Change](#)
- Panelist, “Advancing Understanding of Climate Change: The Role of Science and Global Communication,” Global Issues Forum hosted by Kent State School of Communication, March 2018, approximately 120 attendees.
- Presentation to K-12 Earth Systems Science teachers (~30) through Kent State School of Teaching, Learning, and Curriculum Studies, Fall 2016 and 2017
- Donated “Soil as a filter” hands-on activity to Educator Resource Center at Cleveland Museum of Natural History (Fall 2016); activity was subsequently utilized by K-12 educators in the Cleveland metro area and by museum employees for special events (e.g., 2017 World Water Day)
- Demonstrated “Soil as a filter” hands-on activity to K-12 educators at the *Wade into Wetlands* workshop at the Cleveland Museum of Natural History, Summer 2016

#### **Workshops and Other Activities**

- ORNL SFA Planning Workshop; February 2021
- Summit on Decarbonization of the Agriculture Sector; September 2021
- Gulf Coast Terrestrial-Aquatic Interfaces, ORNL; September 2021 (contributor)
- Spallation Neutron Source workshop, ORNL; September (2019)
- ModEx Approaches to Research on Shorelines (MARSh) workshop; ORNL; September 2019
- Concentration-discharge working group; Pocatello ID; March 2018
- Critical Zone Science: Current Advances and Future Opportunities; Arlington, VA; June 2017
- Early Career Geoscience Faculty, *On the Cutting Edge*; Williamsburg VA; July 2015
- SAVI Early Career Workshop on Critical Zone Resiliency, U. of New Hampshire; June 2015



- Urban Geochemistry Working Group Meeting, International Association of Geochemistry, Ohio State University; August 2014
- Advanced Tools in Environmental Biogeochemistry – Opportunities and Limitations, European Association of Geochemistry course; Tubingen, Germany; August 2011
- International Critical Zone Student Symposium, GES-9 course; Boulder, CO, USA; June 2011
- Thermodynamics and Kinetics of Fluid-Rock Interaction, Mineralogical Society of America course; Davos, Switzerland; August 2009
- Frontiers in Exploration of the Critical Zone II: Geobiology of Weathering and Erosion, NSF workshop; Smithsonian Institute, Washington D.C.; October 2009
- Worldwide University Network/Critical Zone collaboration, University of Sheffield, UK; February 2009
- Techniques in Molecular Biology Workshop, Penn State University, June 2008
- Field Geology in the Rocky Mountains, Indiana University; 2007
- Pathfinder Program in Environment Sustainability, Washington University; 2003-2007

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Geochemical Society; Soil Science Society of America; American Geophysical Union; American Chemical Society