Curriculum vitae

Dr. Elizabeth D. Swanner
Department of the Earth, Atmosphere, and Climate
Iowa State University
(515) 294-5826
eswanner@iastate.edu
https://geobiochem.ge-at.iastate.edu/

EDUCATION

University of Colorado, Boulder; PhD from the Department of Geological Sciences, CU-Boulder; July 2011. Specialty: Geomicrobiology; Advisor: Prof. Dr. Alexis S. Templeton.

Teaching Certificate, Graduate Teacher Program, CU-Boulder. 2012.

Astrobiology Certificate, Center for Astrobiology, CU-Boulder. 2011.

Mount Holyoke College, South Hadley, MA; Bachelor of Arts with High Honors in Biochemistry; May 2003. Major: Biochemistry; Minor: English.

EMPLOYMENT

Professor, Department of the Earth, Atmosphere, and Climate, Iowa State University, Ames, IA. Aug. July 2024-present.

Associate Professor, Department of Geological & Atmospheric Sciences, Iowa State University, Ames, IA. Aug. 2020-June 2024.

Assistant Professor, Department of Geological & Atmospheric Sciences, Iowa State University, Ames, IA. Aug. 2015-2020.

Carl Zeiss Stiftung Postdoctoral Fellow, Department of Geoscience, University of Tübingen, Germany. 2014-2015. Advisors: Ronny Schoenberg & Andreas Kappler.

Postdoctoral Researcher, Department of Geoscience, University of Tübingen, Germany. 2013-2014. Advisors: Ronny Schoenberg & Andreas Kappler.

NSF Postdoctoral Fellow, Department of Geoscience, University of Tübingen, Germany. 2011-2013. Advisors: Andreas Kappler & Martin Obst.

GRANTS

Funded at ISU

37. Agouron Foundation, Grant to support the 12th Annual Midwest Geobiology Symposium in September 2024. PI: E. Swanner and B.W. Johnson.

36. National Science Foundation, supplement to CAREER Award for NSF INTERN program: PhD student Zackry Stevenson to work with USGS partners. PI: E. Swanner. 2024.

35. National Aeronautics and Space Administration, Future Investigators in NASA Earth and Space Science and Technology (FINESST), "Life's Essential Elements: How Early Metal Availability Impacted the Nitrogen Cycle." PI: E. Swanner, Future Investigator (FI): M. Chamberlain. 2023-2026.

34. National Science Foundation, Mid-career Advancement, "MCA: Developing a Paleorecord of Hg in Long-Lived Mollusks from the Gulf of Maine." PI: A. Graham, Co-PI: E. Swanner. 2023-2026.

33. National Aeronautics and Space Administration, Exobiology, "Refining the geochemical toolkit for paleoredox reconstruction." PI: A. Anbar, Co-I: G Gilleaudeau, E. Swanner. 2022-2025.

32. National Science Foundation, Geobiology and Low-temperature Geochemistry, "Collaborative Research: Towards a Better Understanding of Tl Isotope Cycling under Different Redox Conditions." PI: C. Ostrander, Co-PI: C. Hansel, S. Nielsen, E. Swanner. 2021-2024.

31. National Aeronautics and Space Administration, Interdisciplinary Consortium on Astrobiology Research (ICAR), "What Life Wants: Exploring the Natural Selection of Elements." PI: B. Kacar, Co-PI: A. Anbar, Co-I: E. Swanner and many others. 2021-2024.

30. Faculty Professional Development Appointment (i.e., sabbatical), Iowa State University, Fall semester 2021.

29. Advanced Photon Source, General User Proposal, "Tracking aquatic redox conditions and biogeochemistry through Fe, Mn and S mineral (trans)formations." PI: E Swanner. 2020 (access to facility).

28. National Science Foundation, Geobiology and Low-temperature Geochemistry, "CAREER: Quantifying the extent and biogeochemical impact of modern ferruginous lakes." PI: E. Swanner. 2020-2025.

27. Center for Health Effects of Environmental Contamination (CHEEC), "Degradation of 2,4-D by Fe(II)-oxidizing bacteria in Iowa's surface and groundwater." PI: E. Swanner. 2020-2022.

26. Leopold Center for Sustainable Agriculture, "Degradation of herbicides by Fe(II)-oxidizing bacteria in Iowa's surface and groundwater." PI: E. Swanner. 2019.

25. Advanced Photon Source, General User Proposal, "Down-core mapping of sedimentary diagenesis within anoxic lake sediments." PI: E. Swanner. 2019 (access to facility).

24. Hach, Request for DR 1900 spectrophotometer. PI: E Swanner. 2019.

23. Leopold Center for Sustainable Agriculture, "The history of biological activity and climate records in Loess Hills pedogenic carbonates." PI: E. Swanner. 2019-2022.

22. Petroleum Research Fund, Doctoral New Investigator (American Chemical Society), "Determining the mechanism(s) of sedimentary pyrite formation from anoxic (pore)waters." PI: E. Swanner. 2019- 2020.

21. Iowa Space Grant, Early Career Investigator Research Program (ECIRP), "Earth analogues for sedimentary manganese enrichments observed in a Martian paleolake." PI: E. Swanner. October 2018-June 2019.

20. Huron Mountain Wildlife Foundation, “Microbial pathways of iron and methane cycling in ferruginous Canyon Lake.” PI: E. Swanner, Co-PI: C. Wittkop, S. Katsev, and C. Sheik. 2018.

19. Hach, Request for DR 1900 spectrophotometer. PI: E. Swanner. 2017.

18. Environmental Protection Agency, EPA-G2017-STAR-A1, Freshwater Harmful Algal Blooms: “A systems approach for understanding, predicting, and managing harmful algal blooms in Midwestern lakes.” PI: A. Howe, Co-PI: K. Ikuma, E. Swanner, & J. Choi. 2018-2020.

17. Huron Mountain Wildlife Foundation, “Microbial pathways of iron and methane cycling in ferruginous Canyon Lake.” PI: E. Swanner, C. Wittkop, S. Katsev, and C. Sheik. 2017.

16. National Science Foundation, Geobiology and Low-temperature Geochemistry, “Collaborative Research: Biosignatures of coupled iron and carbon cycling in ferruginous lakes.” PI: E. Swanner, Co-PI: C. Wittkop & S. Katsev. 2017-2020.

15. Iowa Water Center, “The role of iron mobility from anoxic sediments in stimulating harmful algal blooms.” PI: E. Swanner. 2017-2018.

14. Foreign Travel Grant, ISU, Goldschmidt Geochemistry Conference, Yokohoma, Japan. Oct. 2016.

13. Huron Mountain Wildlife Foundation, “Constraining pathways of methane, nutrient, and iron cycling in ferruginous Canyon Lake.” PI: C. Wittkop, S. Katsev, and E. Swanner. 2016.

12. Iowa Water Center, “The role of iron mobility from anoxic sediments in stimulating harmful algal blooms.” PI: E. Swanner. 2016-2017.

Funded prior to ISU

11. European Synchrotron Radiation Facility (ESRF), Beamtime granted for “Development of a carbonate proxy for the Fe(II) concentration and Fe isotope composition of ancient seawater.” S. Eroglu and E. Swanner. 2015 (access to facility with funded travel and accommodation).

10. NachwuchswissenschaftlerInnen, grant for young researchers from the University of Tübingen, “Development of a carbonate proxy for the Fe concentration, Fe isotope composition, and oxygen concentration of ancient seawater.” PI: E. Swanner. 2014-2015.

9. Carl Zeiss Stiftung, Postdoctoral Fellowship, “Rusty fingerprints of early cyanobacteria: the fate of Fe(II) during oxygenic photosynthesis.” PI: E Swanner. August 2014-July 2016.

8. Deutsche Forschungsgemeinschaft Schwerpunktprogram, “Building a Habitable Earth”. Helped to write the Geobiology section, program funded March 2014.

7. Stanford Synchrotron Radiation Lightsource (SSRL), Active beamtime proposal for "Fate of Co during diagenetic pyrite formation.” E. Swanner, M. Obst and A. Kappler. 2013-2016 (access to facility).

6. Deutsche Forschungsgemeinschaft Project Grant, “Microbial and diagenetic origins for BIFs mineralogy.” A. Kappler, M. Obst and E. Swanner* (*primary author). 2011-2014.

5. National Science Foundation (NSF) International Research Fellowship Program, “Constraining the role of photosynthetic organisms in deposition of Banded Iron Formations (BIF) on early Earth.” PI: E. Swanner. 2011-2013.

4. National Aeronautics and Space Administration (NASA) Astrobiology Institute, grant to host the Astrobiology Graduate Conference (AbGradCon). 2011.

3. National Science Foundation (NSF) East Asia and Pacific Summer Institutes, Geomicrobiology at Japan Agency for Marine Earth Science and Technology. PI: E. Swanner. 2007.

2. Mentorship Grant, Department of Geological Sciences, CU-Boulder. 2010.

1. Geological Society of America (GSA), Graduate Student Research Grant. 2010.

AWARDS

12. Iowa State University, College of Liberal Arts & Sciences (LAS) Cassling Innovation Award, 2023-2024.

11. Iowa State University, College of Liberal Arts & Sciences (LAS) Early Achievement in Research Award, 2020.

10. Geological Society of America (GSA) Geobiology and Geomicrobiology (GBGM) Division Pre-tenure Award, 2019.

9. Best Student Talk, Hydrogeology Symposium, CU-Boulder. 2011.

8. Nordic-NASA Astrobiology, summer school on "Water, Ice and the Origin of Life in the Universe" in Iceland, accepted in 2009 (declined).

7. NASA Astrobiology Institute, International Summer School of Astrobiology, Santander, Spain, accepted in 2009.

6. Colorado Scientific Society, Invited talk on student night; 3rd Prize. 2009.

5. "Best Should Teach" Silver Award, CU-Boulder. 2008 & 2009.

4. Mary Lyon Scholar, Mount Holyoke College. 2003.

3. Louisa Stone Stevenson Prize, Mount Holyoke College. 2002.

2. National Scholar-Athlete, Collegiate Rowing Coaches Association. 2001 & 2002.

1. NEWMAC Academic All-Conference. 2001.

SCHOLARSHIP

Publications

Google Scholar h-index: 26; 2,840 citations (September 2024)

*Denotes student or postdoc author supervised by Swanner

2024

52. Heard A, Ostrander CM, Swanner ED, *Rico K, and S Nielsen. "Iron Cycling and Isotopic Fractionation in a Ferruginous, Seasonally Ice-Covered Lake." (in press) *Geochimica et Cosmochimica Acta.*

51. Gasda PJ, Lanza NL, Meslin P-Y, Lamm SN, Cousin A, Anderson R, Forni O, Swanner E, L'Haridon J, Frydenvang J, Thomas N, Stein N, Fischer WW, Hurowitz J , Sumner D, Rivera-Hernández F, Crossey L, Ollila A, Essunfeld A, Newsom HE, Clark B, Wiens RC, Gasnault O, Clegg SM, Maurice S, Delapp D, Reyes-

Newell A. “Manganese-rich sandstones as an indicator of ancient oxic lake water conditions in Gale crater, Mars.” (2024) *Journal of Geophysical Research – Planets,* 129, e2023JE007923.

50. Grengs A, *Ledesma G, Xiong Y, Katsev S, Poulton SW, Swanner ED, and C W. “Direct precipitation of siderite in ferruginous environments.” accepted in *Geochemical Perspectives Letters,* 30: 1-6.

49. Swanner ED, Harding C, Akam S, Lascu I, *Ledesma G, *Poudel P, *Sun H, *Duncanson S, *Bandy K, *Branham A, *Bryant-Tapper L, *Conwell T, *Jamison O, and LE *Netz. “Four meromictic (?) lakes in Itasca State Park, Minnesota, U.S.A.” (2024) *Biogeosciences.*

48. *Akam S, Chuang P-C, Katsev S, Wittkop C, Chamberlain C, Dale A, Wallmann K, Heathcote A, and E Swanner. “Methane-Carbon Budget of a Ferruginous Meromictic Lake and Implications for Marine Methane Dynamics on Early Earth.” (2024) *Geology,* 52:187–192

2023

47. Villanueva P, Yang J, Liang X, *Leung T, Ikuma K, Swanner ED, Howe A, and J Lee. “One–week ahead prediction of cyanobacterial harmful algal blooms in Iowa lakes.” (2023) *Environmental Science & Technology* 57

46. *Stevenson Z, *Tong H, and ED Swanner. “Insights on biotic and abiotic 2,4-D degradation by anaerobic Fe-cycling bacteria.” *Journal of Environmental Quality.*

45. Treiman AH, Lanza NL, VanBommel S, Berger J, Wiens R, Bristow T, John J, Rice M, Hart R, McAdam A, Gasda PJ, Meslin P-Y, Yen AS, Williams AJ, Vasavada AR, Vaniman DT, Tu VM, Thorpe MT, Swanner ED, Seeger C, Schwenzer SP, Schröder S, Rampe EB, Rapin W, Ralston S, Peretyazhko TS, Newsom HE, Morris RV, Ming DW, Loche M, Le Mouélic S, House CH, Hazen RM, Grotzinger JP, Gellert R, Gasnault O, Fischer WW, Essunfeld AL, Downs RT, Downs GW, Dehouck E, Crossey LJ, Cousin A, Comellas JM, Clark JV, Clark III BC, Chipera S, Caravaca G, Bridges JC, Blake DF, and RB Anderson. “Manganese-Iron Phosphate Nodules at the Groken site, Gale Crater, Mars.” (2023) *Minerals* 13:1112.

44. *Akam SA, Swanner ED, Yao H, Hong W-L, and J Peckmann. “Methane-derived authigenic carbonates – A case for a globally relevant marine carbonate factory.” (2023) *Earth-Science Reviews.*

43. *Leung T and E Swanner. “Statewide lake assessment reveals spatiotemporal variability of iron in Iowa lakes.” *Journal of Contemporary Water Research & Education,* 177.

(Dataset) Leung T, Swanner E, Lee J, et al (2022) Phytoplankton chlorophyll in Iowa state recreational lakes 2018-2020. Environmental Data Initiative. https://portal.edirepository.org/nis/mapbrowse?packageid=edi.1073.1. Accessed 28 Jan 2022

42. Robbins LJ, Fahkree M, Smith AJB, Bishop BA, Swanner ED, Peacock C, Planavsky NJ, Reinhard CT, Crowe SA, and Lyons TW. “Manganese oxides, Earth surface oxygenation, and the rise of oxygenic photosynthesis.” (2023) *Earth-Science Reviews,* 239.

41. *Ledesma G, *Islam R, and ED Swanner. “Evaluation of preservation protocols for oxygen-sensitive minerals within laminated aquatic sediments.” (2023) *Limnology & Oceanography Methods.* (published in EarthArXiv: https://doi.org/10.31223/X5M068)

(Dataset) Swanner ED, Islam R, Ledesma G, et al (2022) Geochemical data from sediments and porewaters from ferruginous and meromictic Brownie Lake, Minnesota, U.S.A. Environmental Data Initiative. https://doi.org/10.6073/pasta/68b50baa0a767ab33f2b7dd91948036e. Accessed 8 Jun 2022

2022

40. *Kasiviswananathan P, Swanner ED, Halverson LJ, and P Vijayapalani. “Farming on Mars: Treatment of Basaltic Regolith Soil and Briny Water Simulants Sustains Plant Growth.” (2022) *PLoS One*.

39. Swanner ED, *Wüstner M, *Leung T, Pust J, *Fatka M, *Lambrecht N, Chmiel H, and H Strauss. “Seasonal phytoplankton and geochemical shifts in the subsurface chlorophyll maximum layer of a dimictic ferruginous lake: the Grosses Heiliges Meer in Germany.” (2022) *Microbiology Open*.

(Dataset) Swanner ED, Leung T (2021) Physical, Chemical and Biological Data from the Grosses Heiliges Meer, Germany. Iowa State University Data Share. https://doi.org/10.25380/iastate.14394455.v1

(Dataset) Swanner ED, Lascu I, *Ledesma G, *Leung T, *Akam S. “Water properties of Arco Lake, Budd Lake, Deming Lake, and Josephine Lake in Itasca State Park from 2006-2009 and 2019-2021 ver. 1. & ver. 2” (2022) Environmental Data Initiative.

2021

(Dataset) Swanner ED, *Lambrecht N, Wittkop C, Katsev S, *Ledesma G, and *T Leung. “Water properties of Brownie Lake, MN and Canyon Lake, MI from 2015-2019 ver 1.” (2021) Environmental Data Initiative.

38. Schad M, *Halama M, Robbins LJ, Warchola TJ, Tejada J, Kirchhof R, Lalonde SV, Swanner ED, Planavsky NJ, Thorwarth H, Mansor M. Konhauser KO, and A Kappler. “Phosphate Remobilization from Banded Iron Formations during metamorphic Mineral Transformations.” (2021) *Chemical Geology*, 584, 120489.

37. *Lambrecht N, *Stevenson Z, Sheik CS, *Pronschinske MA, *Tong H, and ED Swanner. “‘*Candidatus* Chlorobium masyteum’, a novel photoferrotrophic green sulfur bacterium enriched from a ferruginous meromictic lake.” (2021) *Frontiers in Microbiology*.

36. *Leung T, Wilkinson G, and ED Swanner. “The role of iron availability during cyanobacteria dominance of algal blooms, as monitored by chlorophyll fluorescence.” *Inland Waters*, 1-13.

(Dataset) Swanner E, Wilkinson G, Leung T (2021) Chemical and physical data of East and West Okoboji Lake (Iowa, USA) collected in 2017. Iowa State University Data Share. https://doi.org/10.25380/iastate.14394443.v1

35. Erickson ML, Swanner ED, Ziegler BA, and JR Havig. “Months-long spike in aqueous As following domestic well installation and disinfection: short- and long-term drinking water quality implications.” *Journal of Hazardous Materials,* 414: 125409.

34. Tong H, Li B, Swanner E, Liu C, Chen MJ, Xia Y, Liu Y, Ning Z, Li F, and X Feng. “Microaerophilic oxidation of Fe(II) coupled with simultaneous carbon fixation and As(III) oxidation and sequestration in karstic paddy soil.” (2021) *Environmental Science & Technology.*

33. Kappler A, Bryce C, Mansor M, Byrne JM, Swanner ED, and U Lueder. “An evolving view on biogeochemical cycling of iron.” *Nature Reviews Microbiology.*

2020

32. Swanner ED, *Lambrecht N, Wittkop C, Harding C, Katsev S, Torgeson J, and SW Poulton. “The biogeochemistry of ferruginous lakes and past ferruginous oceans.” (2020) *Earth-Science Reviews.*

31. Cole DB, Planavsky NJ, Longley M, Böning P, Wilkes D, Wang X, Swanner ED, Wittkop C, Busigny V, Knudsen A, and EA Sperling. “Uranium isotope fractionation in anoxic settings and the global uranium isotope mass balance.” (2020) *Global Biogeochemical Cycles*, 34(8).

30. Lee J, Choi J, *Fatka M, Swanner ED, Ikuma K, Liang X, *Leung T, and A Howe. “Improved detection of *mcy*A genes and their phylogenetic origins in harmful algal blooms.” (2020) *Water Research*, 176(115730).

29. Wittkop C, Swanner ED, *Lambrecht N, Myrbo A, Grengs A, Torgeson J, and S Katsev. "Manganese carbonates signal suboxic methanotrophy in ferruginous environments." *Earth & Planetary Science Letters.*

28. *Lambrecht NL, Wittkop C, Katsev S, Sheik C, Fakhraee M, Hall SJ, and ED Swanner. “Biogeochemical and physical controls on methane fluxes from two meromictic ferruginous lakes.” (2020) *Geobiology*, 18(1):54-69. Dataset: https://doi.org/10.6073/pasta/58e6964173075655506963 1ebc687a61. Dataset accessed 1/07/2020

2019

27. *Tong H, Hao L, Chen MJ, Li F, Liu C, Swanner E, Xia Y, Liu Y, and Y Liu. "Biological Fe(II) and Arsenic Oxidation for Arsenic Immobilization in Microaerophilic Environments." (2019) *Geochimica et Cosmochimica Acta*, 265: 96-108.

26. Swanner ED, Webb SM, and A Kappler. "Fate of cobalt and nickel in mackinawite during diagenetic pyrite formation." (2019) *American Mineralogist*, 104: 917-928.

25. Babechuk M, Weimar N, Kleinhanns I, *Eroglu S, Swanner ED, Kenny G, Kamber B, and R Schoenberg. "Pervasively anoxic surface conditions at the onset of the Great Oxidation Event: new multi-proxy constraints from the Cooper Lake paleosol." (2019) *Precambrian Research,* 323: 126-163.

2018

24. *Lambrecht N, Wittkop C, Katsev S, Fakhraee M, and ED Swanner. "Geochemical characterization of two ferruginous meromictic lakes in the Upper Midwest, U.S.A." (2018) *JGR Biogeosciences*, 123(10): 3403-3422.

23. *Eroglu S, Schoenberg R, Pascarelli S, Beukes N, Kleinhanns I, and E Swanner. "Iron speciation and isotope systematics of the Neoarchean Campbellrand-Malmani carbonate platform, South Africa." (2018) *American Journal of Science*, 318(4):367-408.

22. Swanner ED, *Wu W, *Maisch M, and A Kappler. "Oxic Fe(III) reduction could have generated Fe(II) in the photic zone of Precambrian seawater." (2018) *Scientific Reports*, 8(1):4238.

21. Konhauser KO, Robbins LJ, Alessi DS, Flynn SL, Gingras MK, Martinez RE, Kappler A, Swanner ED, Li Y-L, Crowe SA, and SV Lalonde. "Phytoplankton contributions to the trace element composition of Precambrian banded iron formation." (2018) *GSA Bulletin*.

2017

20. Eroglu S, van Zuilen M, Taubald H, Drost K, Wille M, Swanner E, Beukes N, and R Schoenberg. "Continuously increasing oxidation state by organic burial on shallow marine shelves during the Neoarchean." (2017) *Precambrian Research*, 302:122-139.

19. *Wu W, Swanner ED, Kleinhanns IC, Schoenberg R, Pan Y, and A Kappler. “Fe isotope fractionation during Fe(II) oxidation by the marine photoferrotroph *Rhodovulum iodosum* in the presence of Si – Implications for Precambrian iron formation deposition.” (2017) *Geochimica et Cosmochimica Acta,* 211: 307-321.

18. Swanner ED, *Bayer T, *Wu W, Hao L, Obst M, Sundman A, Byrne JM, Michel FM, Kappler A, and R Schoenberg. "Iron isotope fractionation during Fe(II) oxidation mediated by the oxygen-producing marine cyanobacterium *Synechococcus* PCC 7002." (2017) *Environmental Science & Technology*, 51(9): 4897-4906.

2016

17. *Maisch, M, Wu, W, Kappler, A and ED Swanner. "Laboratory simulation of an iron(II)-rich Precambrian marine upwelling system to explore the growth of photosynthetic bacteria." (2016) *Journal of Visualized Experiments*, 113:e54251.

16. *Halama M, Swanner ED, Konhauser KO, and A Kappler. "Evaluation of siderite and magnetite formation in BIFs by pressure-temperature experiments of Fe(III) minerals and microbial biomass." (2016) *Earth and Planetary Science Letters*, 450:243-253.

15. Hao L, Guo Y, Byrne JM, Zeitvogel F, Schmid G, Ingino P, Li J, Neu TR, Swanner ED, Kappler A, and M Obst. "Binding of heavy metal ions in aggregates of microbial cells, EPS and biogenic iron minerals measured in-situ using metal- and glycoconjugates-specific fluorophores." (2016) *Geochimica et Cosmochimica Acta*, 180:66-96.

2015

14. Swanner ED, Wu W, Hao L, *Wuestner ML, Obst M, Moran DM, McIlvin M, Saito M and A Kappler. "Physiology, Fe(II) oxidation, and Fe mineral formation by a marine planktonic cyanobacterium grown under ferruginous conditions." (2015) *Frontiers in Earth Science*, 3.

2015 and earlier (prior to ISU start)

13. Swanner ED, *Wu W, Schoenberg R, Byrne J, Michel FM, Pan Y and A Kappler. "Fractionation of Fe isotopes during Fe(II) oxidation by a marine photoferrotroph is controlled by the formation of organic Fe-complexes and colloidal Fe fractions." (2015) *Geochimica et Cosmochimica Acta,* 165:44-61.

12. *Robbins LJ, Swanner ED, Lalonde SV, Eickhoff M, Paranich ML, Reinhard CT, Peacock CL, Kappler A and KO Konhauser. "Limited Zn and Ni mobility during simulated Iron Formation diagenesis." (2015) *Chemical Geology*, 402:30-39.

11. Swanner ED, Mloszewska AM, Cirpka OA, Schoenberg R, Konhauser KO and A Kappler. "Modulation of oxygen production in Archean oceans by episodes of Fe(II) toxicity." (2015) *Nature Geoscience*. 8(2):126-130.

10. Melton ED, Swanner ED, Behrens S, Schmidt C and A Kappler. "The Interplay of Microbially Mediated and Abiotic Reactions in the Biogeochemical Fe Cycle." (2014) *Nature Reviews Microbiology*. 12:797-808.

9. *Wu W, Swanner ED, Hao L, Zeitvogel F, Obst M, Pan Y and A Kappler. "Characterization of the physiology and cell-mineral interactions of the marine anoxygenic phototrophic Fe(II)-oxidizer *Rhodovulum iodosum* - implications for Precambrian Fe(II) oxidation." (2014) *FEMS Microbiology Ecology*. 88:503-515.

8. Swanner ED, Planavsky NP, Lalonde SV, Robbins LJ, Bekker A, Rouxel OJ, Kappler A, Mojzsis SJ and KO Konhauser. "Cobalt and marine redox evolution." (2014) *Earth & Planetary Science Letters.* 390:253-263.

7. Swanner ED, Cates N, Pecoits E, Bekker A, Konhauser KO and SJ Mojzsis. "Geochemistry of pyrite from diamictites of the Boolgeeda Iron Formation, Western Australia with implications for the GOE and Paleoproterozoic ice ages." (2013) *Chemical Geology*. 362:131-142

6. Posth NR, Köhler I, Swanner ED, Schröder C, Wellman E, Binder B, Konhauser KO, Neumann U, Berthold C, Nowak M and A Kappler. "Simulating Precambrian banded iron formation diagenesis." (2013) *Chemical Geology.* 362:66-73.

5. Swanner ED and AS Templeton. "Potential for nitrogen fixation and nitrification in the granite-hosted subsurface at Henderson Mine, CO." (2011) *Frontiers in Extreme Microbiology.* 2, doi: 10.3389/fmicb.2011.00254.

4. Swanner ED, Nell RM, and AS Templeton. "*Ralstonia* species mediate Fe-oxidation in circumneutral, metal-rich subsurface fluids of Henderson Mine, CO." (2011) *Chemical Geology.* 284: 339-350.

3. Benardini J, Vaishampayan P, Schwendner P, Swanner E, Fukui Y, Osman S, Satomi M and K Venkateswaran. "*Paenibacillus phoenicis* sp. nov. a spore forming bacterium isolated from the Phoenix Lander assembly facility." (2010) *Int. J. Syst. Env. Microbiol.* 61(6):1338-43.

2. Mayhew LE, Swanner ED, Templeton AS, Martin AP. (2008) "Phylogenetic relationships and functional genes: distribution of a manganese-oxidizing gene (mnxG) in Bacillus species." *Applied & Environmental Microbiology.* 74(23): 7265-7271.

1. Sahl JW, Schmidt R, Swanner ED, Mandernack KW, Templeton AS, Kieft TL, Smith RL, Sanford WE, Callaghan RL, Mitton JB, Spear JR. (2008) "Subsurface Microbial Diversity in Deep-Granitic-Fracture Water in Colorado." *Applied & Environmental Microbiology.* 74(1): 143-152.

Invited Presentations

2025

52. Swanner ED. "TBD". Departmental Seminar, University of Utah, Department of Geology and Geophysics. *To be presented February 13, 2025.*

2024

51. Swanner ED, Akam S, Chamberlain M, Heard AW, and J Meyer. "A place in our world: what the iron cycle in ferruginous lakes can teach us about past ferruginous oceans." Keynote at Goldschmidt Geochemistry Conference, Chicago, IL. August 2024.

50. Swanner ED. "Cold, dark, and rusty: photosynthesis in ferruginous lakes." American Chemical Society Spring Meeting, New Orleans, LA. March 17, 2024.

2023

49. Swanner ED. "They Contain Depths: What Midwestern Lakes Tell Us About Early Earth and Mars." College of Liberal Arts and Sciences presents the LAS Dean's Distinguished Lecture. November 7, 2023.

48. Swanner ED. "A look at meromictic, Holocene-aged Midwestern lakes and what they can tell us about early ocean processes." Dartmouth College Earth Sciences Department Seminar. September 14, 2023.

47. Swanner ED. "Iron Cycling on Earth Earth – Lessons from Lakes." Department of Geology & Environmental Earth Science, Miami University (Virtual). April 17, 2023.

2022

46. Swanner ED. "Hidden resources within Minnesota's lakes." Natural Resource Research Institute. July 29, 2022.

45. Swanner ED. "How does sedimentary pyrite form?" Agouron International Geobiology Course Symposium, Caltech. July 6, 2022.

44. *Islam R and ED Swanner (presenting author). "How does sedimentary pyrite form?" American Chemical Society, San Diego, CA. March 20-24, 2022.

43. Swanner ED. "Toto – I've a feeling we're not in the Archean anymore: using analogs to explore past biogeochemistry." NASA ICAR Metal Utilization and Selection Across Eons Team Meeting (Virtual). March 11, 2022.

42. Swanner ED. "How does sedimentary pyrite form?" Interface Geochemistry Seminar Series, Deutsches GeoForschungsZentrum, Potsdam (Virtual). February 17, 2022.

2021

41. Swanner ED. “The hidden wonders of Minnesota’s meromictic and ferruginous lakes”. University of Minnesota-Duluth, Water Resources Graduate Seminar (Virtual). October 11, 2021.

40. Swanner ED. “How environment influences life: stratification, primary production, and metal availability.” NASA ICAR Metal Utilization and Selection Across Eons Workshop (Virtual). September 10, 2021.

39. Swanner ED. “Sedimentary Geochemistry of Mn: formation pathways from aquatic systems and relationship to P.” Groken Interest Group, Mars Science Laboratory (Virtual). August 17, 2021.

38. Swanner ED. “The hidden role of iron in primary productivity in some Midwest glacial lakes.” Midwest Glacial Lakes Partnership (Virtual). May 4, 2021.

37. Swanner ED. “How the geochemistry of sediments can inform our understanding of the habitability of past Earth and planetary environments.” ISU Inorganic Chemistry seminar series (Virtual). January 29, 2021.

2020

36. Swanner ED. “The big impact of small ferruginous lakes on global elemental cycles.” Bristol Geobiology Seminar (Virtual). Nov. 24, 2020.

35. Swanner ED. “Updates and insights from monitoring CyanoHABs in Iowa’s lakes with multi-wavelength fluorescence.” EPA Great Plains and Midwest Harmful Algal Blooms Conference. Feb. 5, 2020.

2019

34. Swanner ED. “The story of iron in Iowa’s lakes and why it matters.” Seminar at University of Iowa, Civil and Environmental Engineering. November 15, 2019.

33. Swanner ED, Wittkop C, Lambrecht N, Katsev S, and A Picard. “Records of life in a ferruginous ocean: lessons from meromictic lakes”. Geological Society of America Meeting, Phoenix, AZ. September 22-25, 2019.

32. Swanner ED. “How iron cycling in lakes informs our understanding of the greater terrestrial iron cycle.” Institute of Geochemistry, Chinese Academy of Sciences, Guiyang, Guizhou, China. July 25, 2019.

31. Swanner ED. “How iron cycling in lakes informs our understanding of the greater terrestrial iron cycle.” Guangdong Institute of Eco-environmental Science & Technology, Guangzhou, Guangdong, China. July 22, 2019.

30. Swanner ED. “Tracking cyanoHABs with chlorophyll fluorescence.” Environmental Protection Agency, Region 7 office. May 9, 2019.

2018

29. Swanner ED. “The importance of ferruginous systems on Earth – past and present.” Seminar at University of Cologne, Germany. December 5, 2018.

28. Swanner ED, Lambrecht N, Wittkop C, Katsev S, Fakhraee M, and C Sheik. “The biogeochemistry of ferruginous lakes and past ferruginous oceans. Keynote presented at Geological Society of America Meeting, Indianapolis, IN. November 4-7, 2018.

27. Swanner ED. “Photosynthesis under the anoxic and iron-rich conditions of Early Earth.” Seminar at University of Minnesota, Plant and Microbial Biology. October 17, 2018.

26. Swanner ED, *Lambrecht N, Fakraee N, Sheik C, Katsev S, and C Wittkop. “Microbes and minerals from two ferruginous lakes on a spectrum of anthropogenic impacts.” Keynote presented at Goldschmidt Geochemistry Conference, Boston, MA. August 12-17, 2018.

25. Swanner ED. “Relevance of stratified Midwestern lakes to past, present, and future microbial biogeochemistry.” American Chemical Society, New Orleans, LA. March 18-21, 2018.

24. Swanner, ED. “Chemically-stratified Midwestern lakes are relevant to Precambrian AND modern global biogeochemistry.” University of Michigan, Department of Earth and Environmental Sciences, John A. Dorr Memorial Lecture, March 9, 2018.

2017

23. “Micronutrients matter: the role of iron in harmful algal blooms”, Friends of Lakeside, Lakeside Laboratory, Milford, IA. Aug. 15, 2017.

2016

22. “Establishment of early ocean analogs in Midwestern ferruginous lakes: keys to the evolution of biogeochemical Fe cycling”, Geological Society of America, Denver, CO. Sept. 26, 2016.

21. “The role of ferrous iron in oxidation of Earth’s atmosphere and oceans”, University of Minnesota, Department of Earth Sciences. May 5, 2016.

20. Gordon Geobiology Conference, Invited chair of “Metals as biogeochemical proxies” session, Galveston, TX. Feb. 2016.

19. “The role of ferrous iron in oxidation of Earth’s atmosphere and oceans”, Northwestern University, Department of Earth & Planetary Sciences. Jan. 8, 2016.

2015

18. “The role of ferrous iron in oxidation of Earth’s atmosphere and oceans”, University of Iowa, Department of Earth & Environmental Sciences. Nov. 6, 2015.

17. “The role of ferrous iron in oxidation of Earth’s atmosphere and oceans”, Indiana University-Purdue University, Indianapolis, Department of Earth Sciences, Oct. 12, 2015.

2015 and earlier (prior to ISU start)

16. “Iron isotopes as tracers of microbial and redox processes”, University of Tübingen, Zentrum für Angewandte Geowissenschaften Seminar, June 12, 2015.

15. “The role of Fe in modulating Earth’s oxygenation”, Origin of Life Symposium, University of Göttingen. Oct. 17, 2014.

14. “Toxic levels of Fe(II) in Archean seawater delayed the Great Oxidation Event”, Goldschmidt Geochemical Conference, Sacramento, CA. June 13, 2014.

13. “The trace element composition of anoxic oceans and their effect of on biogeochemical cycles”, Biosignatures 2014 Conference, University of Bergen, Norway. May 21, 2014.

12. “Did Archean environmental conditions limit oxygen production by early cyanobacteria?”, University of New Mexico, Department of Earth and Planetary Sciences. March 2014.

11. “Did Archean environmental conditions limit oxygen production by early cyanobacteria?”, University of California, Los Angeles, Department of Earth, Planetary and Space Sciences. Feb. 2014.

10. “Did Archean environmental conditions limit oxygen production by early cyanobacteria?”, Dartmouth College, Department of Earth Sciences. Jan. 2014.

9. “Did Archean environmental conditions limit oxygen production by early cyanobacteria?”, Mount Holyoke College, Department of Geology and Program in Biochemistry. Jan. 2014.

8. “Did Archean environmental conditions limit oxygen production by early cyanobacteria?”, Iowa State University, Department of Geological and Atmospheric Sciences. Jan. 2014.

7. “How we can use modern bacteria to understand ancient environments”, Roundtable discussion for Priority Program on Early Earth (DFG SPP), University of Cologne, Germany. July 2013.

6. “Examining the relationship between oxygenic photosynthesis and Fe(II) oxidation”, University Pierre & Marie Curie-IMPMC, Paris, France. March 2013.

5. “Examining the relationship of oxygenic photosynthesis to iron oxidation,” Gordon Research Seminar in Geobiology, Ventura, CA. Jan. 2013.

4. “Microbially-mediated geochemical cycling of iron and nitrogen within the granite- hosted subsurface of Henderson Mine, CO”, Colorado School of Mines, Golden, CO. Jan. 2013.

3. “Co-evolution of the microbial biosphere and geosphere: evidence from sediments, microbes and simulations”, University of Delaware, Department of Geological Sciences. Nov. 2012.

2. “Investigation of a Terrestrial Subsurface Biosphere at Henderson Mine, CO”, Florissant Scientific Society, Boulder, CO. 2010.

1. “Effective lesson planning for teaching assistants”, Graduate Teacher Program Intensive, University of Colorado. 2009.

Refereed Presentations from Major Conferences

*denotes student author or advisee of Swanner

2024

102. *Afonso Garcia M, *Getz T, and ED Swanner. “Identifying iron mineral sinks for phosphorus in a eutrophic lake.” SACNAS, Phoenix, AZ. *To be presented October 2024.*

101. *Rico K, Swanner ED, and A Anbar. “Examining the Molybdenum Paleo-Redox Proxy in Modern Ferruginous Waters.” Goldschmidt Geochemistry Conference, Chicago, IL. August 2024.

100. Chamberlain M, and ED Swanner. “Was early photosynthesis constrained by ferruginous conditions?” Goldschmidt Geochemistry Conference, Chicago, IL. August 2024.

99. Rico KI, Swanner ED, and AD Anbar. “Molybdenum Abundance and Isotopes in Ferruginous Waters.” AbSciCon, Rhode Island, May 2024.

2023

98. *Akam S, *Rico K, and ED Swanner. "Methane-Carbon Cycling in Archean Ocean: Lessons from Ferruginous Lakes". American Geophysical Union. December 2023.

97. *Rico K, Swanner E, and A Anbar. “Metals and microbes and redox, oh my: Molybdenum abundance and isotopes in a ferruginous Precambrian analogue.” Geological Society of America. October 2023.

96. *Akam S, Hardisty D, Wang X, Feng D, Hashim M, Burke J, Swanner E, Antoine Crémière, Jörn Peckmann. “Iodine content in methane-derived authigenic carbonates and their implications for marine methane flux dynamics.” Midwest Geobiology Symposium. September 23, 2023.

95. *Chamberlain M and ED Swanner. “Quantifying primary productivity and intracellular iron among phytoplankton in Brownie Lake.” Midwest Geobiology Symposium. September 23, 2023.

94. Akam S, Hardisty D, Wang X, Feng D, Hashim M, Burke J, Swanner E, Cremierie A, and J Peckmann. “Incorporation of Iodine in methane-derived authigenic carbonates: Implications to methane flux dynamics.” Goldschmidt Geochemistry Conference. July 2023.

93. Heard AW, Nielsen SG, Blusztajn JS, Ostrander CM, Swanner ED, and MK Tivey. “Constraining triple Fe isotopic behavior in an expanded array of modern aqueous environments.” Goldschmidt Geochemistry Conference. July 2023.

92. *Stevenson Z, and ED Swanner. “Molybdenum Requirements of Diazotrophs Relevant to Archean Earth.” American Society of Microbiology. June 2023.

91. Swanner ED, *Akam S, *Rico K, Liu X-L, Chuang P-C, and AJ Heathcote. “Changes in the carbon cycle of an urban lake after an anthropogenically-driven transition to meromixis.” Association for the Sciences of Limnology and Oceanography. June 2023.

2022

90. Ostrander C, Nielsen SG, Swanner ED, Gadol HJ, Villarroel L, Wankel S, Heard AW, Schulz-Vogt HN, Voss M, Horner T, and CM Hansel. “Towards a better understanding of thallium isotope cycling in modern redox-stratified settings." American Geophysical Union. December 2022.

89. Kniptash R, Meyer J, and ED Swanner. "Quantifying the Heterogeneity in Iron Mass Discharge in a Groundwater-Ferruginous Lake System, Brownie Lake, Minnesota". American Geophysical Union. December 2022.

88. Lanza N, Gasda P, Swanner E, and others. Precipitation of Mn-bearing nodules in shallow soft sediments in Gale crater, Mars. Geological Society of America Abstracts with Programs, v. 54, no. 4. October 2022.

87. *Akam S, Hong W-L, Peckmann J, and ED Swanner. “Methane-derived authigenic carbonates – A case for a globally relevant marine carbonate factory.” Midwest Geobiology Symposium. September 2022.

86. *Stevenson Z, *Tong H, and ED Swanner. “Insights of 2,4-D degradation by Fe(II)-oxidizing bacteria and Fe(III)-reducing bacteria.” Midwest Geobiology Symposium. September 2022.

85. *McConnell T, *Riddley M, *Stevenson Z, and ED Swanner. “Biological and Geochemical Controls on Iron Deposition in an Intermittent Stream.” Midwest Geobiology Symposium. September 2022. (**won best undergraduate presentation award**)

84. Swanner ED, *Ledesma G, and *R Islam. “Preservation protocols for oxygen-sensitive minerals within laminated aquatic sediments for spectroscopic and other geochemical analyses.” Goldschmidt Geochemistry Conference. July 2022.

83. *Akam S, Swanner ED, and C Wittkop. “Carbon Budget of a Ferruginous Meromictic Lake with Ebullitive Methane Fluxes.” Goldschmidt Geochemistry Conference. July 2022.

82. *Block K and ED Swanner. “Taxonomically Resolved Uptake of Iron and Carbon Fixation by Phytoplankton Within a Ferruginous, Meromictic Lake.” Joint Aquatic Sciences Meeting. May 14-20, 2022.

81. *Ledesma G and ED Swanner. “Can Trace Element Patterns in Terrestrial Manganese Minerals Help Determine Mineral Type in Gale Crater, Mars?” Astrobiology Science Conference. May 15-20, 2022. (invited talk)

80. *Stevenson Z, and ED Swanner. “Regulation of Nitrogen Fixation by Molybdenum Availability in Simulated Archean Ocean Conditions.” Astrobiology Science Conference. May 15-20, 2022.

79. *Riddley M, *McConnell T, and ED Swanner. “Biological and Chemical Controls on Iron Deposition in an Intermittent Stream.” McNair Research Symposium. April 26, 2022.

78. *Block K, and ED Swanner. “Taxonomically resolved carbon fixation by phytoplankton within a ferruginous, meromictic lake.” Environmental Sciences Graduate Program Symposium. April 20, 2022.

77. *Riddley M, *McConnel T, and ED Swanner. “Biological and Geochemical Controls on Iron Deposition in an Intermittent Stream.” Symposium on Undergraduate Research and Creative Expression. Iowa State University. April 20, 2022.

76. Treiman AH, Bristow T, Lanza N, and others. 2022. Manganese–Phosphorus Substances, Present and Past, in the Groken/Ayton Rock (Glen Torridon, Gale Crater, Mars). 53rd Lunar and Planetary Science Conference. 1293.

75. Lanza, NL, Gasda PJ, Swanner E, and others. 2022. Precipitation of Mn-Bearing Nodules in a Shallow Shoreline Environment in Gale Crater, Mars. 53rd Lunar and Planetary Science Conference. 2689.

74. *Beeck J and ED Swanner. “Carbonate Concretions in Iowa’s Loess Hills: Modern Carbon Sink or Paleoclimatic Indicators?” Research in the Capitol. February 22, 2022.

2021

73. *Kniptash R, ED Swanner, and J Meyer. “Characterizing Dissolved Iron Concentrations and Groundwater Fluxes in an Aquifer Discharging to a Ferruginous, Meromictic Lake.” Geological Society of America. October 10-13, 2021.

72. *Islam R and ED Swanner. “Identifying the intermediate sulfur species in sedimentary pyrite formation under anoxic & ferruginous conditions.” Midwest Geobiology Conference. September 25, 2021 (talk canceled due to illness).

71.*Block K, *Lambrecht N, and E Swanner. “The influence of iron on anoxygenic photosynthesis within a meromictic ferruginous lake.” Midwest Geobiology Conference. September 25, 2021.

70. Perez JT, Gilleaudeau G, Swanner E, and S Romaniello. “Is the uranium isotope proxy a reliable indicator of ferruginous conditions?” Goldschmidt Geochemistry Conference. July 2021.

69. Wittkop C, Grengs A, Ledesma G, Xiong Y, Poulton S, Katsev S, and E Swanner. “Siderite precipitation from a carbonate green-rust precursor in ferruginous Canyon Lake.” Goldschmidt Geochemistry Conference. July 2021.

68. Swanner E, Meyer J, and S Alexander. “Quantifying the groundwater source of iron to redox-stratified lakes in Minnesota, U.S.A.” Goldschmidt Geochemistry Conference. July 2021.

67. *Beeck JR, Rasmussen M, and ED Swanner. “Origin of carbonate concretions in Iowa's loess soils.” National Conference on Undergraduate Research, Virtual, April 2021.

2020

66. *Islam R, and ED Swanner. “Constraining the intermediate sulfur species involved in sedimentary pyrite formation.” Goldschmidt Geochemistry Conference, Virtual, June 2020.

65. Romaniello SJ, Gilleaudeau GJ, Swanner ED, Wittkop CA and X Chen. “U(VI) reduction in an oligotrophic ferruginous ocean analog?” Goldschmidt Geochemistry Conference, Virtual, June 2020.

64. Swanner ED. “What can subsurface chlorophyll maximum layers (SCML) tell us about productivity in ferruginous oceans?” Goldschmidt Geochemistry Conference, Virtual, June 2020.

63. *Islam R, and ED Swanner. “Uncovering the intermediates in pyrite formation under ferruginous conditions.” North Central Geological Society of America, Virtual, May 2020.

62. *Ledesma G, Wittkop C, Lanza N, and ED Swanner. “Classification of Terrestrial Manganese Enrichments by Laser-induced breakdown spectroscopy with relevance for Gale crater, Mars.” North Central Geological Society of America, Virtual, May 2020. (**won best undergraduate talk)**

61. *Beeck JB, Rasmussen M, and ED Swanner. “Pedogenic carbonate concretions in Iowa’s loess soils: a modern carbon sink? North Central Geological Society of America, Virtual, May 2020. **(won best undergraduate poster)**

60. Niedzielski B, Wittkop C, Swanner E, Fralick P, and S Poulton. “Evaluating mechanisms for manganese enrichments in the Proterozoic Animikie Basin.” North Central Geological Society of America, Virtual, May 2020.

59. *Ledesma G, ED Swanner, N Lanza, C Wittkop, RC Wiens, SM Clegg, A Reyes-Newell, PJ Gasda, D DeLapp. “Analysis of Manganese-rich terrestrial sediments by laser-induced breakdown spectroscopy to elucidate the formation of Mn-enrichments in Gale crater, Mars.” Lunar and Planetary Science Conference, Houston, TX. *March 2020 presentation canceled due to Covid-19.*

58. *Ledesma G, ED Swanner, and N Lanza. “Analysis of Mn-rich lake sediments by laser induced breakdown spectroscopy to elucidate the formation of Mn-enrichments in Gale crater, Mars.” National Conference on Undergraduate Research, Bozeman, MT. *March 2020 presentation canceled due to Covid-19.*

2019

57. *Leung T, and ED Swanner. “Determining the role of iron in cyanoHABs and photosynthesis in Midwestern lakes.” American Geophysical Union, San Francisco, CA. December 2019.

56. *Islam R, and ED Swanner. “Microscale resolution on how sedimentary pyrite forms.” Great Plains Limnology Conference, Ames, IA. October 19, 2019.

55. *Leung T, and ED Swanner. “Lake monitoring with multi-wavelength fluorescence: insight into phytoplankton community and their health.” Great Plains Limnology Conference, Ames, IA. October 19, 2019.

54. Wittkop C, Swanner ED, *Lambrecht N, Grengs A, and S Katsev. “Is methane oxidation a viable pathway for manganese carbonate genesis?” Goldschmidt Geochemistry Conference, Barcelona, Spain. August 23, 2019.

53. *Lambrecht N, and ED Swanner. “Bio-physical controls on the methane flux from ferruginous meromictic lakes in the Midwest.” Association for the Sciences of Limnology & Oceanography Aquatic Sciences Meeting, San Juan, PR. February 23-March 2, 2019.

52. *Leung T, and ED Swanner. “Multi-wavelength fluorescence: a rapid method to track Harmful Algal Blooms in Iowa’s agriculturally impacted lakes.” Association for the Sciences of Limnology & Oceanography Aquatic Sciences Meeting, San Juan, PR. February 23-March 2, 2019.

2018

51. *Ledesma G, and ED Swanner. “Loading filter samples and embedding sediment cores under anoxic conditions for analysis use.” SACNAS National Conference, San Antonio, TX. October 11-13, 2018.

50. Cole DB, Longley M, Wilkes D, Wang X, Swanner ED, Wittkop CA, Sperling EA, and NJ Planavsky. “Uranium isotope fractionation factors in ferruginous settings.” Goldschmidt Geochemistry Conference, Boston, MA. August 12-17, 2018.

49. Wittkop C, Swanner ED, *Lambrecht N, Grengs A, Myrbo A, and S Katsev. “Are manganese carbonates linked to methane oxidation?” Goldschmidt Geochemistry Conference, Boston, MA. August 12-17, 2018.

48. *Lambrecht N, Wittkop C, Katsev S, Fakraee M, Sheik C, and ED Swanner. “Two ferruginous Midwestern lakes exhibit vastly different fluxes of methane.” Goldschmidt Geochemistry Conference, Boston, MA. August 12-17, 2018.

47. *Leung T and ED Swanner. “Dissolved Iron as a Driving Factor of Cyanobacterial Harmful Algal Blooms (CyanoHABs).” Goldschmidt Geochemistry Conference, Boston, MA. August 12-17, 2018.

46. Swanner ED, Webb S, and A Kappler. “Fate of Cobalt and Nickel during diagenetic pyrite formation.” Goldschmidt Geochemistry Conference, Boston, MA. August 12-17, 2018.

45. *Nolte D, and E Swanner. “Using DNA-based techniques to detect phytoplankton in lake ice.” Symposium on Undergraduate Research & Creative Expression, Iowa State University, Ames, IA. April 10, 2018.

44. *Fatka M, and E Swanner. Title: TBD. Symposium on Undergraduate Research & Creative Expression, Iowa State University, Ames, IA. April 10, 2018.

43. Swanner E, Harding C, and C Wittkop. “The elemental consequences of lake stratification and implications for urban lakes in the upper Midwest.” North-Central Geological Society of America Meeting, Ames, IA. April 15-17, 2018.

42. G Crews, BE Caissie, and E Swanner. “Assessing the Prevalence of Sub-Ice Productivity in Iowa Lakes.” North-Central Geological Society of America Meeting, Ames, IA. April 15-17, 2018.

41. *Lambrecht N, and E Swanner. “Microbial communities of two Archean ocean analogs.” North-Central Geological Society of America Meeting, Ames, IA. April 15-17, 2018.

40. *Leung T, and E Swanner. “The role of benthic iron during Cyanobacterial Harmful Algal Blooms (CyanoHABs) occurrences.” North-Central Geological Society of America Meeting, Ames, IA. April 15-17, 2018.

39. *Atchison ED, *Leung T, and E Swanner. “Is Iron Shuttling a Driver of Harmful Algal Blooms in East and West Okoboji Lake, I.A.?” Iowa Water Conference, Ames, IA. March 21-22, 2018. (note: second place student poster prize)

38. *Leung T, and E Swanner. “Does iron stimulate Cyanobacterial Harmful Algal Bloom (CyanoHAB) in Okoboji Lake, IA?” Iowa Water Conference, Ames, IA. March 21-22, 2018. (invited talk)

37. Swanner ED. “Relevance of stratified Midwestern lakes to past, present, and future microbial biogeochemistry.” American Chemical Society, New Orleans, LA. March 18-21, 2018.

36. ED Swanner, C Wittkop, S Katsev, *N Lambrecht. “The untapped potential for ferruginous ocean analog sites in lakes of the upper Midwest, U.S.A.” Gordon Research Conference in Geobiology, Galveston, TX. Jan. 21-25, 2018.

35. *N Lambrecht, ED Swanner, C Sheik, C Wittkop, S Katsev. “The microbial community of a ferruginous, meromictic lake in Minneapolis, MN.” Gordon Research Conference in Geobiology, Galveston, TX. Jan. 21-25, 2018.

2017

34. ED Swanner. “The role of “Oxic Fe(III) reduction” in the Archean iron cycle.” Midwest Geobiology Meeting, Indianapolis, IN. Sept. 30, 2017.

33. *T Leung and ED Swanner. “Does benthic iron shuttling promote the occurrence of cyanobacterial Harmful Algal Blooms (cyanoHABs)?” Midwest Geobiology Meeting, Indianapolis, IN. Sept. 30, 2017.

32. *N Lambrecht, ED Swanner, S Katsev, C Wittkop, C Sheik. “Two newly documented ferruginous lakes in the Midwest, USA are Archean ocean analogs.” Midwest Geobiology Meeting, Indianapolis, IN. Sept. 30, 2017.

31. C Wittkop, E Swanner, N Lambrecht, S Katsev, A Grengs, D Widman. “Controls on iron- and manganese-mineral solubility in ferruginous lakes.” Geological Society of America, Seattle, WA. Oct. 22-25, 2017.

2016

30. *N Lambrecht, ED Swanner, C Wittkop, C Sheik, and S Katsev. “The Isolation of a Novel Photoferrotroph from Brownie Lake Provides a Mechanism for Studying the Iron Biogeochemical Cycle

of a Pre-Oxic Earth." American Society for Microbiology North Central Branch Meeting, Ames, IA. Oct. 21-22, 2016.

29. *T Leung and ED Swanner. "Assessing the Role of Ferrous Iron in the Formation of Harmful Algal Blooms in Okoboji Lake, Iowa." Iowa Water Conference, Ames, IA. March 21-22, 2017.

28. C Wittkop, ED Swanner, *N Lambrecht, S Katsev. "Dissolved inorganic carbon isotope signatures in ferruginous lakes: new insights into ancient carbon isotope excursions." American Geophysical Union, San Francisco, CA. Dec. 12-16, 2016.

27. *S Eroglu, ED Swanner, S Pascarelli, R Schoenberg, H Taubald, and NJ Beukes. „Iron Speciation and Iron Isotopes of Neoarchean Ca-Mg Carbonates." Goldschmidt Geochemical Conference, Yokohama, Japan. June 26-July 1, 2016.

26. *S Eroglu and ED Swanner. "Iron systematics of Late Archean tidal flats." Gordon Research Conference in Geobiology, Galveston, TX, Jan. 31-Feb. 5, 2016.

2015

25. *M Maisch, *W Wu, A Kappler, and ED Swanner. "Laboratory-scale simulation of Precambrian ocean Fe(II)-rich upwelling: implications for cyanobacteria and oxygen production." Midwest Geobiology Meeting, Bloomington, IN. Oct. 10, 2015.

24. ED Swanner. "Fe isotopes as tracers of Fe biomineralization processes and intermediates formed by phototrophic organisms." Midwest Geobiology Meeting, Bloomington, IN. Oct. 10, 2015.

2015 and earlier (prior to ISU start)

23. *Bayer T, *Wu W, Kappler A, Schoenberg R, and ED Swanner. "Fe isotope fractionation during Fe(II) oxidation by cyanobacteria." Goldschmidt Geochemical Conference, Prague, Czech Republic. Aug. 16-21, 2015.

22. Eroglu S, Schoenberg R, van Zuilen M, Taubald H, Swanner ED, and N Beukes. "The geochemical and isotopic record of a Neoarchean oxygen oasis." Goldschmidt Geochemical Conference, Prague, Czech Republic. Aug. 16-21, 2015.

21. *Maisch M, *Wu W, Kappler A, and ED Swanner. "A laboratory-scale column to investigate Archean, Fe(II)-rich upwelling systems." Goldschmidt Geochemical Conference, Prague, Czech Republic. Aug. 16-21, 2015.

20. *Halama M, Swanner ED, A Kappler. "Carbon isotope fractination of organic carbon during simulated diagenesis of banded iron formations." Goldschmidt Geochemical Conference, Prague, Czech Republic. Aug. 16-21, 2015.

19. *Halama M, Swanner ED, and A Kappler. "Fate of organic carbon and primary iron minerals during simulated diagenesis of banded iron formations." Goldschmidt Geochemical Conference, Sacramento, CA. June 8-13, 2014.

18. Swanner ED, Mloszewsa AM, Konhauser KO, Schoenberg R, and A Kappler. "Toxic levels of Fe(II) in Archean seawater delayed the Great Oxidation Event." Goldschmidt Geochemical Conference, Sacramento, CA. June 8-13, 2014.

17. *Wu W, Swanner ED, Pan Y, and A Kappler. "Physiological and Mineralogical Characterization of Fe(II) Oxidation by a Marine Photoferrotroph." German Mineralogical Society meeting, Tübingen, Germany. Sept. 15-18, 2013.

16. Swanner ED, Wu W, Schoenberg R, and A Kappler. "Iron: a secular control on biologically-driven oxidation." German Mineralogical Society meeting, Tübingen, Germany. Sept. 15-18, 2013.

15. *Wu W, Swanner ED, Pan Y, Schoenberg R, and A Kappler. "Fe(II) oxidation of a marine photoferrotroph and implications of its role in the deposition of Precambrian BIFs." Goldschmidt Geochemical Conference, Florence, Italy. Aug. 25-30, 2013.

14. Swanner ED, *Wu W, Voelker B, Schoenberg R, and A Kappler. „The quantitative contribution of oxygenic photosynthesis to Fe(II) oxidation in Precambrian oceans." Goldschmidt Geochemical Conference, Florence, Italy. Aug. 25-30, 2013.

13. ED Swanner, A Bekker, N Cates, E Pecoits, KO Konhauser, and SJ Mojzsis. Geochemistry of pyrite from diamictites of the Hamersley Basin, Western Australia with implications for the GOE and Paleoproterozoic ice ages. European Geosciences Union, Vienna, Austria. April 7-12, 2013.

12. ED Swanner, NJ Planavsky, S Lalonde, LJ Robbins, A Bekker, O Rouxel, KO Konhauser, and SJ Mojzsis. "Sedimentary Cobalt Concentrations track marine redox evolution." European Geosciences Union, Vienna, Austria. April 7-12, 2013.

11. ED Swanner, NJ Planavsky, S Lalonde, LJ Robbins, A Bekker, O Rouxel, KO Konhauser, and SJ Mojzsis. "Sedimentary Cobalt Concentrations track marine redox evolution." Gordon Research Conference in Geobiology, poster, Ventura, CA. Jan. 27- 31, 2013.

10. KO Konhauser, Robbins LJ, Eickhoff M, Swanner ED, and A Kappler. "Banded Iron Formation as Seawater Proxies." Goldschmidt Geochemical Conference, Montreal, Quebec. June 24-29, 2012.

9. Swanner ED and A Kappler. "Cyanobacteria and photoferrotrophs: together again?" Goldschmidt Geochemical Conference, Montreal, Quebec. June 24-29, 2012.

8. Pecoits E, Swanner ED, Cates NL, Konhauser KO, and Mojzsis. "Trace metal abundances in banded iron-formation sulfides track secular changes in microbial community structure with progressive oxidation." Goldschmidt Geochemical Conference, Prague, Czech Republic. Aug. 14-19, 2011.

7. ED Swanner and AS Templeton. "A Microbially-mediated Deep Terrestrial Nitrogen Cycle at Henderson Mine, CO." Goldschmidt Geochemical Conference, Prague, Czech Republic. Aug. 14-19, 2011.

6. ED Swanner. "Early hydrogen production on carbonaceous asteroids could support subsurface life." Astrobiology Graduate Conference (AbGradCon), Bozeman, MT. June 4-8, 2011.

5. Swanner ED, Nell RM, and AS Templeton. "*Ralstonia* species mediate Fe-oxidation in the deep biosphere of Henderson Mine." Goldschmidt Geochemical Conference, Knoxville, TN. June 13-18, 2010.

4. ED Swanner, N Cates, E Pecoits, KO Konhauser, and SJ Mojzsis. “Multiple sulfur isotopes and trace elements in Precambrian sedimentary sulfides reflect shifting microbial communities during the GOE.” Gordon Research Conference in Geobiology, Ventura, CA. Jan. 30-Feb. 4, 2011.

3. Mojzsis SJ, Van Kranendonk MJ, and ED Swanner. “Microbial community structure and atmospheric oxygen ca. 2.4 Ga. Goldschmidt Geochemical Conference, Davos, Switzerland. June 21-26, 2009.

2. Swanner ED and AS Templeton. “Subsurface iron cycling by a single species of bacteria.” Astrobiology Graduate Conference (AbGradCon), Seattle, WA. July 17-18, 2009.

1. ED Swanner and AS Templeton. “Microbially-mediated cycling of metals in deep subsurface fluids at Henderson Mine, Colorado.” Goldschmidt Geochemical Conference, Vancouver, BC. July 13-18, 2008.

TEACHING EXPERIENCE

GEOL 406/506, Geology Field Trip, Spring 2022 (2 cr.), Fall 2023 (1 cr.), Spring 2024 (1-2 cr.).

GEOL 100, The Earth, ISU, Spring 2019 and 2023 (in-person) and Spring 2021 (online).

GEOL 490ES, Independent Study in Geochemistry, ISU, 2 students in Spring 2021.

MICRO 490ES, Independent Study in Microbial Ecology, ISU, 2 students in Spring 2018.

ENSCI 483/583, Environmental Biogeochemistry, ISU, co-taught with Prof. Steven Hall, Spring 2017, 2019, 2021, 2023.

BIOL 487/EEOB 587, Microbial Ecology, ISU, Fall 2016-2020, 2022-2024.

GEOL 419/519, Aqueous and Environmental Geochemistry, ISU, Spring 2016, 2018, 2020, 2022, 2024.

Project supervisor, Geomicrobiology Lab Course, University of Tübingen, Oct. 2013.

Teaching Geology Workshops, Presenter and Facilitator. 2008 & 2009.

Geology Lead Graduate Teacher, Graduate Teacher Program, CU-Boulder. 2008-2010.

Teaching Assistant, Introduction to Geology Laboratory, Department of Geological Sciences, CU-Boulder. 2007-2008.

Field Instructor, The Women’s Wilderness Institute, Boulder, CO. 2005.

Field Instructor, Four Corners School of Outdoor Education, Monticello, UT. 2003.

Field Instructor, Outward Bound West, UT and CO. 2003-2005.

STUDENTS AND TRAINEES

Current

Farhan Bhuiyan, PhD student in Earth Sciences graduate program, ISU, 2024-present.

Dr. Katy Rico, Postdoctoral Researcher, co-advised with Dr. Ariel Anbar, Arizona State University, 2022-present.

Michelle Chamberlain, PhD student in Interdepartmental Microbiology Program, ISU, 2022-present.

Zackry Stevenson, PhD student in Interdepartmental Microbiology Program, ISU, 2020-present.

Completed

Dr. Sajjad Akam, Postdoctoral Researcher, Department of Geological & Atmospheric Sciences, ISU, 2021-present.

Kaleigh Block, MS student in Geology Program and Environmental Sciences Graduate Program, ISU, 2020-2022.

Raisa Islam, MS student in Geology Program and Environmental Sciences Graduate Program, ISU, 2019-2021.

Tania Leung, PhD in Geology Program and Environmental Sciences Graduate Program, ISU, 2016-2021.

Dr. Hui Tong, Visiting Scholar (China Scholarship Council) in Dept. of Geological & Atmospheric Sciences, ISU, 2018-2020.

Micah Fatka, MS in Geology Program and Environmental Sciences Graduate Program, ISU, 2018-2021.

Nick Lambrecht, postdoc, ISU, 2019-2020; PhD in Interdepartmental Microbiology Program, ISU, 2016-2019.

ISU Undergraduates: Cristina Santana (2015-2016), William McNamara (2016), Megan Greenlee (First year honors project; 2016), Erin Atchison (Iowa Space Grant Scholarship mentor; 2017-2018), Raisa Islam (Mt. Holyoke summer intern, 2017), Matthew Pronschinske (Honors thesis mentor; 2017-2018), Anna Drahos (2018), Micah Fatka (490: 2018), Danika Nolte (490: 2018), Anthony Davis (2018), Garrett Crews (490 with Beth Caissie: 2018), Gabbie Ledesma (LAS Dean's High Impact Award, Iowa Space Grant Scholarship mentor; 2018-2020), Jazlyn Beeck (First year honors project, LAS Dean's High Impact Award, Honors thesis mentor; 2019-2022), Brinlee Geyer (2019), Tamara McConnell (2020-2023), William Manriquez (McNair Scholar; 2020), Mia Riddley (McNair Scholar, 2021-2023), Mariela Alfaro Garcia (2024-present).

Sümeyya Eroglu, PhD Fulbright Fellow at ISU (during PhD at University of Tuebingen), January-July 2016 (currently an Assistant Professor at University of Muenster).

Markus Maisch, supervised MS project at ISU/University of Tuebingen, 2015-2016 (subsequently finished a PhD at University of Tuebingen).

Wenfang Wu, supervised postdoc project at University of Tuebingen, 2014-2016 (currently a science teacher at English language school in Beijing, China).

Max Halama, supervised PhD project at University of Tuebingen, 2013-2016 (currently working in industry in Germany).

SERVICE & LEADERSHIP ACTIVITIES

Associate Editor for *Geochimica et Cosmochimica Acta*, 2023-present.

Associate Editor for *Geo-Bio Interfaces*, 2023-present.

Journal Reviews

For: *American Mineralogist*; *Applied Geochemistry; Astrobiology; Biogeochemistry; Chemical Geology; Economic Geology; Environmental Pollution; Environmental Science & Technology*; *Frontiers; Geobiolog; Geochemistry: Exploration, Environment, Analysis; Geochemical Perspectives Letters; Geochemistry, Geophysics, Geosystems; Geochimica et Cosmochimica Acta; Geology; International Society of Microbial Ecology; Limnology and Oceanography; Journal of Environmental Monitoring; Journal of Geophysical Research: Planets; Journal of Geophysical Research: Biogeosciences; Microbes and Environments; Nature Communications; Nature Geoscience, Science; Scientific Reports.*

Verified reviews since ISU start (Aug. 2015): 65
(https://www.webofscience.com/wos/author/record/1350877)

Proposal Reviewer or Panelist

American Chemical Society-Petroleum Research Fund, Fonds de Recherche du Quebec, Iowa Space Grant, the National Aeronautics and Space Administration (NASA) Solar Systems, NASA Habitable Worlds, the National Science Foundation (NSF) Antarctic Organisms and Ecosystems, NSF Geochemistry and Low-Temperature Geobiology, NSF Marine Chemistry and Geochemistry, the Natural Sciences and Engineering Research Council (NSERC – Canada), the Research Institute of the University of Bucharest, the Stanford Synchrotron Radiation Lightsource.

Conference Organization and Session Convener

Faculty mentor (with Dr. Ben Johnson) of students planning the 2024 Midwest Geobiology Symposium, sponsored by the Agouron Foundation.

Co-convener, Session on aquatic methane biogeochemistry, Goldschmidt Geochemistry Conference, July 2022.

Co-convener, Session on microbes, North Central Geological Society of America Meeting (virtual), May 2020.

Organizer, Great Plains Limnology Conference, October 2019.

Co-convener, Session on biology of modern analogues, Goldschmidt Geochemistry Conference, August 2018.

Co-convener, Biogeochemistry session, North Central Geological Society of America Meeting, April 2018.

Exhibits Chair, 2018 North Central Geological Society of America Meeting, April 2018.

Co-convener, Session on Biogeochemical cycling of iron, manganese, sulfur, and chromium for Goldschmidt Geochemistry Conference, June 2016.

Co-convener, Session on early Earth analogues for Goldschmidt Geochemistry Conference, August 2015.

Co-convener, Session on microbe-mineral interactions for German Mineralogical Society, September 2013.

Co-convener, Session on ferruginous settings for Goldschmidt Geochemistry Conference, August 2013.

Co-convener, Session on Early Earth for European Geosciences Union, April 2013.

Chairperson & Education and Public Outreach Coordinator, Astrobiology Graduate Conference, Montana State University, Bozeman. 2009-2011.

Organizer, Geology Graduate Student Poster Session, CU-Boulder, CO. 2010.

Departmental and University Service

Department of Geological and Atmospheric Sciences

Associate Chair, Fall 2023-present.

Director of Graduate Education (DOGE), Geology Program. 2022-present.

Ad hoc Governance Document Revision Committee. 2022.

Ad hoc Post-tenure review committee. 2021.

Promotion and Tenure Committee. 2020-present.

Diversity, Equity, and Inclusion Committee (DEI). 2020-present (Chair 2020-2024).

Faculty Evaluations Committee. 2019-2022.

Awards Committee. 2019-2020.

Search Committee, Sedimentary Geologist, 2018-2019.

Advisory committee to the chair. 2018-2022.

Maintain ISU Geology Facebook page, 2018-present.

Geology Banquet Committee. 2017-2018.

Geology Curriculum Committee. 2016-2020.

Ronald Lecture Committee. 2016-2018.

Geology Space Committee (Chair). 2016-2018.

Geology Graduate Student Admissions Committee. 2015-2018, 2022-present.

Iowa State University

Faculty Review Board, ISU Provost's Office. August 2024- present.

COACHE Action Committee, ISU Provost's Office. April 2022-present.

College of Liberal Arts & Sciences DEI Chairs Council. 2021-2022.

Environmental Sciences Graduate Student Organization Advisor. 2016-2021.

Microbiology Graduate Student Organization Advisor. 2018-2019.

Outreach

Microbial Ecology and Winogradsky column lesson with two Ames Girl Scout Troops. July 30, 2023.

"The Precambrian! It's too old… but why do we still care about it?" with Dr. Ben Johnson on "The Changing Earth: A Talk Show on Earth Science" hosted by Dr. Sajjad Akam, KURE (88.5FM), aired November 4, 2022.

WikiEdu Course Instructor: Microbiology Wikipedia pages written by Microbial Ecology 487/587: 20 in Fall 2020, 19 in Fall 2022, 12 in Fall 2023, 12 forthcoming in Fall 2024; "Deming Lake" Wikipedia page written by GEOL 406/506, Spring 2022; Biogeochemistry Wikipedia pages written by Environmental Biogeochemistry 583:6 in Spring 2023.

"5 Facts in 5 Minutes" stand with student in NSF CAREER-sponsored field course, Mississippi Headwaters, Minnesota Department of Natural Resources, May 2022.

Environmental Science workshops for middle schoolers, Unitarian Universalist Fellowship of Ames religious education program, October 2021.

Brownie Lake Science Walk and Talk with Neighborhood Associations, Summer 2021.

Workshop Leader, ISU Program for Women in Science in Engineering (PWISE), October 2016-2021.

Co-wrote "Brownie Lake" Wikipedia entry, October 2018.

Established "Ferruginous Lakes" YouTube channel with videos about research, October 2018. Updated with student videos from NSF CAREER-sponsored field course, May 2022.

Advisor of award-winning Astrobiology project for Iowa Junior Academy of Science and State Science & Technology Fair of Iowa, 2018.

Workshop Organizer, ISU Youth 4H conference, June 2016-2019.

Mentor, Goldschmidt Geochemistry Conference, June 2014.

Blogger, European Association of Geochemistry, 2013-2015.

Instructor, Children's University: Microbiology, University of Tuebingen, July 2013.

Scientific Writing & Illustrator Workshops, University of Tuebingen. 2012 & 2013.

Invited Representative, University of Tuebingen's application for Excellence Funding. 2012.

"A metabolically-versatile bacterium thrives in granitic rock of the deep subsurface." Dance Your PhD Contest Entry, Sponsored by Science/AAAS. 2010.

Field Trip Leader, Geology Summer Field Series, CU-Boulder, CO. 2010.

Editor, Matriculation Guide for Incoming Graduate Students, Department of Geological Sciences, CU-Boulder, CO. 2010.

Compiler, Online Resources for TAs of Geology 1030, Department of Geological Sciences, CU-Boulder, CO. 2009.