LAURA EILEEN WASYLENKI

August 2024

EDUCATION

Stanford University	Geology and Symbolic Systems	B.S., 1992
California Institute of Technology	Geology	M.S., 1995
California Institute of Technology	Geology	Ph.D., 1999
Virginia Polytechnic Institute and State I	Jniversity Geosciences	Postdoc, 2002-04

POST PhD APPOINTMENTS

2018 – 2024	Full Professor, Northern Arizona University (Associate Professor 2018-2023)
2010 – 2018	Associate Professor (2016-2018), Assistant Professor (2010-2016) Department of Earth and Atmospheric Sciences Indiana University-Bloomington
2017 – 2017	Professeure Invitée, École Polytechnique Fédérale de Lausanne (EPFL)
2016 – 2017	Blaustein Visiting Associate Professor, Stanford University
2004 – 2010	Assistant Research Scientist (externally funded salary) School of Earth and Space Exploration Arizona State University
2002 – 2004	Postdoctoral Research Associate (with P. Dove) Department of Geosciences Virginia Polytechnic and State University
1999 – 2002	Assistant Professor Department of Geology and Environmental Science Hartwick College, Oneonta, New York
1999 – 1999	Visiting Assistant Professor (teaching) Department of Geology University of Illinois, Urbana-Champaign

EXTERNAL GRANT SUPPORT (total = \$4.0M; as PI = \$3.1M)

- NSF-OCE 2148715: "Resolving controls on the marine nickel budget." 03/01/2022-02/28/2025; \$446,518 sole PI.
- NSF-CHE-ECS 1608401: "Development of tungsten stable isotope analysis for constraining sorption mechanisms and tracking transport and fate of tungsten." 07/01/2016 07/31/2022; \$270,000, sole PI.
- NSF-EAR-GG 1424676: "Assessing the role of methanogens in driving earth oxygenation using Ni isotopes." *12/01/2014 11/30/2020*; \$174,997, sole PI.
- NASA Exobiology NNX11AH54G: "Assessing nickel isotope fractionation during abiotic processes." 04/01/2011 – 03/31/2016; \$443,683, sole PI.
- NASA Exobiology NNX15AP83G: "Investigating the role of methanogens in the Great Oxidation Event using Ni isotopes." 01/01/2016 12/31/2017; \$157,894, sole PI.
- NSF-OCE 1143984: "Collaborative research: systematics of zinc isotopes in the oceans: assessing the role of speciation and surfaces." 09/01/2011 08/31/2014; \$293,516 (originally awarded as \$458,912 at ASU in 2009, then transferred to Indiana University), as sole PI after transfer to IU.

EXTERNAL GRANT SUPPORT, continued

- NSF-MRI 1040195: "Acquisition of a multiple-collector inductively-coupled plasma mass spectrometer (MC-ICP-MS) for geological, environmental, and microbiological research at Indiana University." 10/01/2010 09/30/2016; \$1,115,843, as lead PI, with Co-Is Lisa Pratt and Ed Ripley.
- NSF-MGG/OCE 0952394 (as Co-I, with PI A.D. Herrmann and Co-I A.D. Anbar) "Uranium isotopes in carbonate sediments: assessing a new paleoredox proxy." 06/01/2010 05/31/2014; \$368,544 (no funds transferred to Indiana Univ).
- NSF-OCE 0526618 (as Co-I, with PI A.D. Anbar and Co-I T.G. Spiro) "Collaborative Research: Transition metal isotope fractionation during adsorption to authigenic oxides." 09/01/2005 – 08/31/2008; \$300,074.
- NSF-EAR-GG 0519347 (as Co-I, with PIs A.D. Anbar and S.L. Brantley) "Collaborative Research: Investigation of Fe and Mo isotope fractionation during weathering." 08/01/2005 07/31/2008; \$229,888.

PEER-REVIEWED PUBLICATIONS (3161 citations, *h*-index = 27, i10 index = 35)

*Student or postdoctoral researcher under my direct mentorship.

- <u>L.E. Wasylenki</u>, *R.M. Wells, *L.J. Spivak-Birndorf, *E.J. Baransky, A.J. Frierdich (2024) Toward mending the marine mass balance model for nickel: Experimentally determined isotope fractionation during Ni sorption to birnessite. *Geochimica et Cosmochimica Acta* 379, 76-88. doi: <u>10.1016/j.gca.2024.06.022</u>
- S.G. John, J. Fitzsimmons, X. Bian, D.A. Hutchins, B. Pasquier, F. Fu, H. Liang, M. Smith, N. Lanning, R. Kelly, S.-C. Yang, E. Seelen, T.M. Conway, M. Holzer, <u>L.E. Wasylenki</u> (2022) The biogeochemical balance which controls oceanic nickel cycling. *Nature Geoscience* 15, 906-912. doi: <u>10.1038/s41561-022-01045-7</u>
- J.M. Smith, E.M. Ripley, C. Li, <u>L.E. Wasylenki</u> (2022) Cu and Ni isotope variations of country rock-hosted massive sulfides located near Midcontinent Rift intrusions. *Economic Geology* 117(1), 195-211. doi: <u>10.5382/econgeo.4872</u>
- M. Li, S. Grasby, *S.-J. Wang, X. Zhang, <u>L.E. Wasylenki</u>, M. Sun, B. Beauchamp, X. Zhang Y. Shen (2021). Ni isotopes link Siberian Traps aerosol particles to the end-Permian mass extinction. *Nature Communications* 12(2024). doi: <u>10.1038/s41467-021-22066-7</u>
- 5. <u>L.E. Wasylenki</u>, *A.T. Schaefer, *P. Chanda, *J.C. Farmer (2020) Tungsten stable isotopes: A potential probe of reactions governing transport of a toxic heavy metal. *Chemical Geology* 558(119836). doi: <u>10.1016/j.chemgeo.2020.119836</u>
- *S.-J. Wang, R.L. Rudnick, R.M. Gaschnig, H. Wang, <u>L.E. Wasylenki</u> (2019) Methanogenesis sustained by sulfide weathering during the Great Oxidation Event, *Nature Geoscience* 12(4) 296-300. doi: <u>10.1038/s41561-019-0320-z</u>
- J. Render, G.A. Brennecka, *S.-J. Wang, <u>L.E. Wasylenki</u>, T. Kleine (2018) A distinct nucleosynthetic heritage for early Solar System solids recorded by Ni isotope signatures. *Astrophysical Journal* 862(1), 26. doi: <u>10.3847/1538-4357/aacb7e</u>
- J. Nelson, J.R. Bargar, <u>L.E. Wasylenki</u>, G.E. Brown, Jr., K. Maher (2018) Effect of nanoconfinement on Zn(II) adsorption to nanoporous silica. *Geochimica et Cosmochimica Acta* 240, 80-97. doi: <u>10.1016/j.gca.208.08.017</u>
- *L.J. Spivak-Birndorf, *S.-J. Wang, D.L. Bish, <u>L.E. Wasylenki</u> (2018) Nickel isotope fractionation during continental weathering. *Chemical Geology* 476, 316-326. <u>doi:10.1016/j.chemgeo.2017.11.028</u>

PEER-REVIEWED PUBLICATIONS, CONTINUED

- J. Nelson, <u>L.E. Wasylenki</u>, J.R. Bargar, G.E. Brown, K. Maher (2017). Effects of crystallinity and coverage on isotopic fractionation during Zn adsorption onto quartz and amorphous silica surfaces. *Geochimica et Cosmochim. Acta* **215**, 354. <u>doi:10.1016/j.gca.2017.08.003</u>
- *S.-J. Wang, <u>L.E. Wasylenki</u> (2017) Experimental constraints on reconstruction of Archean seawater Ni isotopic composition from banded iron formations. *Geochimica et Cosmochimica Acta* 206, 137-150. <u>doi:10.1016/j.gca.2017.02.023</u>
- 12. *S. Dong, <u>L.E. Wasylenki</u>. (2016) Zinc isotope fractionation during adsorption to calcite at high and low ionic strength. *Chem. Geol.*, **447**, 70. <u>doi:10.1016/j.chemgeo.2016.10.031</u>
- 13. X. Chen, S.J. Romaniello, A.D. Herrmann, <u>L.E. Wasylenki</u>, A.D. Anbar (2016) Uranium isotope fractionation during coprecipitation with aragonite and calcite. *Geochimica et Cosmochimica Acta* **188**, 189-207. <u>doi:10.1016/j.gca.2016.05.022</u>
- E.M. Ripley, *S. Dong, C. Li, and <u>L.E. Wasylenki</u> (2015) Cu isotope variations between conduit and sheet-style Ni–Cu–PGE sulfide mineralization in the Midcontinent Rift System, North America. *Chemical Geology* **414**, 59-68. <u>doi:10.1016/j.chemgeo.2015.09.007</u>
- 15. *A.L. Bryan, *S. Dong, *E.B. Wilkes, and <u>L.E. Wasylenki</u> (2015) Zinc isotope fractionation during adsorption onto Mn oxyhydroxide at low and high ionic strength. *Geochimica et Cosmochimica Acta* **157**, 182-197. <u>doi:10.1016/j.gca.2015.01.026</u>
- <u>L.E. Wasylenki,</u> *H.D. Howe, *L.J. Spivak-Birndorf, Bish D.L. (2015). Ni isotope fractionation in a system relevant to banded iron formations. *Chemical Geology* **400**, 252-265. <u>doi:10.1016/j.chemgeo.2015.02.007</u>
- 17. <u>L.E. Wasylenki</u>, *J.W. Swihart, S.J.Romaniello (2014) Cadmium isotope fractionation during adsorption to Mn oxyhydroxide at low and high ionic strength. *Geochimica et Cosmochimica Acta*, **140**, 212-226. <u>doi:10.1016/j.gca.2014.05.007</u>
- S. Nielsen, <u>L.E. Wasylenki</u>, M. Rehkamper, C.L. Peacock, Z. Xue, E.M. Moon (2013). Towards an understanding of thallium isotope fractionation during adsorption to manganese oxides. *Geochimica et Cosmochimica Acta*, **117**, 252-265. <u>doi:10.1016/j.gca.2013.05.004</u>
- A.D. Herrmann, B. Kendall, T.J. Algeo, G.W. Gordon, <u>L.E. Wasylenki</u>, and A.D. Anbar (2012) Anomalous molybdenum isotope trends in Upper Pennsylvanian euxinic facies: Significance for use of delta Mo-98 as a global marine redox proxy. *Chemical Geology*, **324**, 87-98. <u>doi:10.1016/j.chemgeo.2012.05.013</u>
- L.E. Wasylenki (2012) Establishing the basis for using metal isotopes as paleoproxies. In Isotopic analysis – fundamentals and applications using ICP-MS. Eds. F. Vanhaecke and P. Degryse. Wiley-VCH, Chapter 11. <u>http://tinyurl.com/wasylenkichapter11</u>
- 21. <u>L.E. Wasylenki</u>, J.R. Bargar, C.L. Weeks, T.G. Spiro, J. Hein, A.D. Anbar (2011) The molecular mechanism of Mo isotope fractionation during adsorption to birnessite. *Geochim. Cosmochim. Acta* **75**(17):5019-5031. <u>doi:10.1016/j.gca.2011.06.020</u>
- *G.A. Brennecka, <u>L.E. Wasylenki</u>, J.R. Bargar, S. Weyer, A.D. Anbar (2011) Uranium isotope fractionation during adsorption to Mn-oxyhydroxides. *Env. Sci. & Tech.* 45, 1370-1375. <u>doi:10.1021/es103061v</u>
- 23. L.J. Liermann, R. Mathur, <u>L.E. Wasylenki</u>, J Nuester, A.D. Anbar, and S.L. Brantley (2011) Extent and isotopic composition of Fe and Mo release from two Pennsylvania shales in the presence of organic ligands and bacteria. *Chemical Geology* **231**, 167-180. <u>doi:10.1016/j.chemgeo.2010.12.005</u>

PEER-REVIEWED PUBLICATIONS, CONTINUED

- *J.L.L. Morgan, <u>L.E. Wasylenki</u>, J. Nuester, A.D. Anbar (2010) Predicting equilibrium Fe isotope fractionation using binding affinity of Fe-ligand complexes. *Env. Sci. & Tech.* 44(16):6095-6101. <u>doi:10.1021/es100906z</u>
- 25. J.J. De Yoreo, L.A. Zepeda-Ruiz, R.W. Friddle, S.R. Qiu, <u>L.E. Wasylenki</u>, A.A. Chernov, G.H. Gilmer, P.M. Dove (2009) Rethinking classical crystal growth models through molecular scale insights: consequences of kink-limited kinetics. *Crystal Growth & Design* **9**(12):5135-5144. <u>doi:10.1021/cg900543g</u>
- L.E. Wasylenki, *B.A. Rolfe, C.L. Weeks, T.G. Spiro, A.D. Anbar (2008). Experimental investigation of the effects of temperature and ionic strength on Mo isotope fractionation during adsorption to manganese oxides. *Geochim. Cosmochim. Acta.* 72(24):5997-6005. doi:10.1021/cg900543g
- 27. <u>L.E. Wasylenki,</u> A.D. Anbar, L.J. Liermann, R. Mathur, G.W. Gordon, and S.L. Brantley (2007) Isotope fractionation during microbial metal uptake measured by MC-ICP-MS. *J. Analyt. Atomic Spectr.* **22**:905-910. <u>doi:10.1039/B705476A</u>
- 28. C.L. Weeks, A.D. Anbar, <u>L.E. Wasylenki</u>, and T. G. Spiro (2007). Density functional theory analysis of molybdenum isotope fractionation. *J. Phys. Chem. A* **111**:12434-12438. <u>doi:10.1021/jp074318q</u> See also corrigendum in **112**:10703 (2008). <u>10.1021/jp807974c</u>
- L.E. Wasylenki, P.M. Dove, D.S. Wilson, and J.J. De Yoreo (2005). Nanoscale effects of strontium on calcite growth: an *in situ* AFM study in the absence of vital effects. *Geochim. Cosmochim. Acta* 69:3017-3027. doi:10.1016/j.gca.2004.12.019
- <u>L.E. Wasylenki</u>, P.M. Dove, and J.J. De Yoreo (2005). Effects of temperature and transport conditions on calcite growth in the presence of Mg²⁺: implications for paleothermometry. *Geochim. Cosmo. Acta* 69:4227-4236. doi:10.1016/j.gca.2005.04.006
- 31. K.J. Davis, P.M. Dove, <u>L.E. Wasylenki</u>, J.J. De Yoreo (2004) Morphological consequences of differential Mg²⁺ incorporation at structurally distinct steps on calcite. *American Mineralogist* 89(5-6):714-720. <u>10.2138/am-2004-5-605</u>
- L.E. Wasylenki, M.B. Baker, A.J.R. Kent, E.M. Stolper (2003) Near-solidus melting of the shallow upper mantle: partial melting experiments on depleted peridotite. *J. Petrology* 44(7):1163-1191. <u>10.1093/petrology/44.7.1163</u>
- M.M. Hirschmann, M.S. Ghiorso, <u>L.E. Wasylenki</u>, P.D. Asimow, E.M. Stolper (1998) Calculation of peridotite partial melting from thermodynamic models of minerals and melts: I. Review of methods and comparison with experiments. *J. Petrology* **39**(6):1091-1115. <u>10.1093/petroj/39.6.1091</u>
- 34. M.B. Baker, M.M. Hirschmann, <u>L.E. Wasylenki</u>, E.M. Stolper, M.S. Ghiorso (1996) Quest for low-degree mantle melts—Reply. *Nature* **381**(6580):286. <u>doi:10.1038/381286a0</u>

MANUSCRIPTS IN REVISION, REVIEW, OR PREPARATION

- 1. In preparation: *E.J. Baransky, D.S. Hardisty, J. Rolison, <u>L.E. Wasylenki</u>. Shallow seawater Ni isotope signatures as recorded in primary and diagenetically altered Bahamian carbonates. *Geochimica et Cosmochimica Acta*.
- 2. In preparation: *P. Chanda and L.E Wasylenki. Stable isotope evidence for growth of tungsten surface precipitates on birnessite from three-isotope experiments. *Geochimica et Cosmochimica Acta.*
- 3. In preparation: E.J. Baransky*, J.Post, <u>L.E. Wasylenki</u>. Teasing apart the Ni isotope systematics of different sorption mechanisms to Mn oxides: implications for the marine Ni budget. *Geochimica et Cosmochimica Acta.*
- 4. In preparation: S.-J. Wang*, <u>L.E. Wasylenki</u>. Constraints on the Late Archean marine Ni cycle from isotopic measurements of banded iron formations. *Precambrian Research*.

INVITED TALKS (SINCE 2010)

- 2022: Virginia Polytechnic University University of Southern California University of Minnesota-Twin Cities California State University-Long Beach
- 2021: Geological Society of America Annual Meeting, Portland, Oregon (invited)
- 2020: Gordon Conference on Metals in Biology, Ventura, California Goldschmidt Conference 2020 (keynote)
- 2019: Goldschmidt Conference 2019 (invited) GeoForschungsZentrum-Potsdam, Potsdam, Germany Monash University, Melbourne, Australia
- 2018-2019, as Mineralogical Society of America Distinguished Lecturer: Lawrence University, University of Minnesota-Duluth, Case Western University, University of Alberta, University of Calgary, University of Idaho, Southern Illinois University, University of Kansas, University of Missouri-Springfield
- 2018: Goldschmidt Conference 2018 (1 keynote + 1 invited) University of Wisconsin, Madison (2 job interview talks) University of Wisconsin-Eau Claire
- 2017: Goldschmidt Conference 2017 (invited) École Polytechnique Fédérale de Lausanne (2 talks, as Professeure Invitée) ETH-Zürich Hebrew University (Kaplan Conference, similar to US Gordon Research Conference) University of Washington

Northern Arizona University (job interview)

- 2016: University of California at Los Angeles Stanford University (as Blaustein Visiting Associate Professor) Tulane University The Pennsylvania State University (job interview) University of North Carolina-Chapel Hill
- 2015: Louisiana State University University of Colorado-Boulder (job interview) University of California-Davis The Ohio State University University of British Columbia Carnegie Institution for Science/Geophysical Lab Chinese University of Geosciences, Beijing, China Jilin University, Changchun, China University of Science and Technology of China, Hefei
- 2014: Stony Brook University (job interview) University of Kentucky Goldschmidt Conference 2014 (keynote) Georgia Institute of Technology
- 2013: "EnvironMetal" Isotopes Conference (ETH), invited, Monte Verità, Ascona, Switzerland Goldschmidt Conference 2013 (invited)
- 2012: Gordon Conference: Isotopes in Biological and Chemical Sciences Uranium Biogeochemistry Conference (ETH), invited, Monte Verità, Switzerland Goldschmidt Conference 2012 (invited) University of Illinois Urbana-Champaign Indiana University-Purdue University at Indianapolis
- 2011: Stanford University Oklahoma University

COURSES TAUGHT (SINCE 2010)

- Earth Materials (mineralogy)
- Environmental Chemistry (advanced chemistry and environmental science majors)
- Physics and Chemistry of the Earth's Atmosphere and Hydrosphere
- Introduction to High- and Low-temperature Geochemistry (advanced undergraduates)
- Physical Geology (undergraduate majors, plus another version for non-science majors)
- Evolution of the Earth (undergraduate non-majors)
- Writing and Speaking (graduate students)
- The Art of Geosciences (professional development for first-year graduate students)
- Non-traditional Isotope Geochemistry (graduate seminar)
- Geochemistry of Mineral-Aqueous Solution Interfaces (graduate seminar)
- How do metals move in the environment? (graduate seminar)
- Co-evolution of Minerals, Metals, and Life (graduate seminar)

ADVISING AND MENTORING (SINCE 2010)

- Primary research advisor for 6 postdocs, 7 graduate students, 9 undergraduate researchers
- Thesis committee member or vital mentor for an additional 14 graduate students
- Significant research mentor for 8 graduate students and 3 undergraduates before 2010
- Regular volunteer for Mentor-Mentee program at Goldschmidt Geochemistry Conferences

AWARDS AND AWARD NOMINATIONS (SINCE 2010)

- Honorable Mention for NAU Research and Creative Activity Award (2022)
- Nominated for Outstanding Educator Award, Association for Women Geoscientists (2021)
- Mineralogical Society of America Distinguished Lecturer (2018-19)
- Trustees Teaching Awards, Indiana University (2013 and 2018)
- Nominated for Student Choice Teaching Award, Indiana University (2012)
- Department of Geology Faculty Screwball Award, Indiana University (2015)
- Five wins out of six attempts at adult spelling bees (2010-2022)

PROFESSIONAL SERVICE (SINCE 2010)

- Mentor for new faculty, Faculty Development Office, 2021-2022
- Organizer/convenor of faculty writing/support groups, 2021-2023
- Member of School of Earth & Sustainability Faculty Status Committee, 2022-23
- PhD Admissions Committee, School of Earth & Sustainability, 2019-2021
- Environmental Science Curriculum Committee, 2018-2020
- Elected Secretary of Biogeosciences Section, American Geophysical Union, 2016-2018
- Science Theme co-leader, Goldschmidt Conference, 2019, 2015
- · Convenor of sessions at several Goldschmidt and AGU Fall Annual Meetings
- Proposal review panelist (NSF-EAR, 2022, 2019, 2011, 2012; NASA Exobiology, 2008, 2009; NASA Astrobiology Institute 2012)
- Reviewer of dozens of manuscripts submitted to Science, Nature, Nature Geoscience, Environmental Science and Technology, Geochimica et Cosmochimica Acta, Chemical Geology, Earth and Planetary Science Letters, Journal of Colloid and Interface Science, Journal of Crystal Growth, Journal of Geoscience Education, among others
- Ad hoc reviewer of grant proposals submitted to NSF-MRI, NSF-EAR-GG, NSF-OCE, NSF-MGG, NASA Astrobiology Institute, NASA Exobiology, DOE-BES, ACS-PRF, Swiss NSF, French NRA, US Army Research Office, Stanford Synchrotron Radiation Lightsource
- Founder and leader of XX-MC-PIs, an informal organization for female leaders of MC-ICP-MS labs worldwide, for networking, troubleshooting, and mutual support, 2011-present
- Department Ombudsperson, 2017-2018
- Member of Graduate Affairs Committee, Dept. of Earth and Atmospheric Sciences, 2017-18
- Colloquium organizer for Department of Geological Sciences, 2013-2015

PROFESSIONAL DEVELOPMENT

- Trained in Motivational Interviewing, Spring 2023
- Certified Life Coach June 2023 (International Coaching Federation-accredited training)
- Mindfulness-Based Stress Reduction 8-week course, Winter 2023
- Becoming an Academic Editor 8-week course, Summer 2024

EDUCATION AND PUBLIC OUTREACH

- Developer of storyboard for "EnvironMETALS," a PokemonGo-like app for exploration of metals in Flagstaff landmarks and everyday objects, funded by NSF-CHE Environmental Chemical Sciences
- Initiator, planner, and/or presenting participant in >20 one-day public education and outreach events for adults and children over the years, many with my full research group (*e.g.*, true-to-scale solar system walk, pH and color change, water quality analysis)
- Judge for Outstanding Student Presentation Awards at several American Geophysical Union Annual meetings
- Judge for many campus symposia for graduate and undergraduate talks and posters and mock review panels for students writing NSF GRFP and NASA FINESST proposals
- Geoscience judge for Intel Science and Engineering Fair, 2005 and 2007
- Keynote speaker for GROUPS Science academic year kickoff event (support program for minority science students at IU) (2011)
- Keynote speaker for Women in STEM dormitory orientation session (2013)
- Keynote address at Indiana Junior Academy of Sciences annual competition (2011)
- Year-long mentor for two first-generation, college-bound high school students, Bloomington High School North (2010-11)