

A. L. Wolfe

University of Kentucky, Kentucky Geological Survey
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EDUCATION

- 2010 Ph.D., Geology** University of Pittsburgh, Dept of Geology & Planetary Science
2001 B.S., Marine Science University of South Carolina, Marine Science Program

POSITIONS & APPOINTMENTS

- 2020 - Adjunct Assistant Professor**
University of Kentucky, Department of Earth & Environmental Sciences (Lexington, KY)
- 2019 – Research Scientist (Geologist IV), Geohealth & Environmental Geochemistry**
University of Kentucky, Kentucky Geological Survey (Lexington, KY)
- Adjunct Assistant Professor**
Miami University, Department of Chemistry and Biochemistry (Oxford, OH)
- 2016 – Geochemistry Lab Manager**
2019 Miami University, Department of Geology & Environmental Earth Science (Oxford, OH)
- 2016 - Analytical Chemist**, Environmental Resource Technologies (Ada, OK)
- 2015 – Hydrogeochemist, CSS Dynamac**
2016 Ada, OK
- 2011 - US EPA Postdoctoral Research Fellow**, National Study on Hydraulic Fracturing
2015 ORD National Risk Management Research Laboratory (GWERD; Ada, OK)

AWARDS & RECOGNITION

- 2018** PRIDE Award, Miami University
- 2017** Scientific and Technological Achievement Award, Level 1, U.S. Environmental Protection Agency
- 2016** Bronze Medal, U.S. Environmental Protection Agency
- 2011** Postdoctoral Fellowship, US Environmental Protection Agency
- 2008** Henry T. Leighton Memorial Graduate Scholarship, Department of Geology & Planetary Science, University of Pittsburgh
- 2007** Andrew Mellon Predoctoral Fellowship Recipient, University of Pittsburgh
- 2006** Snowbird Charrette: Integrative Interdisciplinary Collaboration in Environmental Research Design, Invited Workshop. National Science Foundation/Social Science Research Council
- 2005** Innovations in Teaching Award, Department of Geology & Planetary Science, University of Pittsburgh
- 2005** Henry T. Leighton Memorial Graduate Scholarship, Department of Geology & Planetary Science, University of Pittsburgh

- 2004 National Science Foundation GK – 12 Graduate Fellowship, University of Pittsburgh
- 2004 Elizabeth Baranger Excellence in Teaching Award, College of Arts & Sciences, University of Pittsburgh
- 2004 Henry T. Leighton Memorial Graduate Scholarship, Department of Geology & Planetary Science, University of Pittsburgh
- 2003 Henry T. Leighton Memorial Graduate Scholarship, Department of Geology & Planetary Science, University of Pittsburgh

RESEARCH FUNDING

External - Awarded

- 2019 NSF MRI: “Acquisition of a Multi-Collector ICP-MS with Laser Ablation for Geochemical and Geochronological Applications”, **\$765,412**. *Co-PI*

Internal – Awarded

- 2020 UK CARES: “Linking environmental exposure and health outcomes: the importance of data coordination”, **\$10,000**. *PI*
- 2017 MU College of Arts & Sciences Equipment Fund: “Acquisition of Autosampler Enclosure for ICP-OES and HPLC Autosampler to Support Geochemical Analyses”, **\$7,394**. *PI*
- 2016 MU College of Arts & Sciences Equipment Fund: “Acquisition of Laboratory Equipment in Support of Student Research”, **\$10,321**. *PI*

PUBLICATIONS (PEER REVIEWED)

(*blue* designates grad students/postdocs; *red* designates undergraduate students; *IF* = Impact Factor)

- Godebo, T.R., Jeuland, M., Terkle-Haimanot, R., Shankar, A., Alemayehu, B., Assefa, G., Whitford, G., and **Wolfe, A.** (2020). Bone quality in fluoride-exposed populations: A novel application of the ultrasonic method. *Bone Reports*, 12: 100235. (*IF* = 2.43)
- Dietrich, M.**, **Wolfe, A.L.**, Burke, M., Krekeler, M.P.S.. (2019). The first pollution investigation of road sediment in Gary, Indiana: Anthropogenic metals and possible health implications for a socioeconomically disadvantaged area. *Environment International*, 128: 175-192. <https://doi.org/10.1016/j.envint.2019.04.042>. (*IF* = 8.763)
- Wolfe, A.L.**, and Wilkin, R.T. (2017) Evidence of Sulfate-Dependent Anaerobic Methane Oxidation within an Area Impacted by Coalbed Methane-Related Gas Migration. *Environmental Science & Technology*, 51(3): 1901–1909. (*IF* = 7.149)
- Wolfe, A. L.**, Stewart, B. W., Capo, R. C., Liu, R., Dzombak, D. A., Gordon, G. W., and Anbar, A. D.. (2016). Iron isotope investigation of hydrothermal and sedimentary pyrite and their aqueous dissolution products. *Chemical Geology*, 427: 73–82. (*IF* = 4.169)
- Roehrig, E. E.**, Laó – Dávila, D. A., and **Wolfe, A. L.** (2015). Serpentinization History of the Rio Guanajibo Serpentinite Body, Puerto Rico. *South American Journal of Earth Sciences*, 62: 195–217. (*IF* = 2.097)
- Wolfe, A. L.**, Wilkin, R. T., Lee, T. R., **Ruybal, C. J.**, and Oberley, G. G. (2015a). Retrospective Case Study in the Raton Basin, Colorado: Study of the Potential Impacts of Hydraulic Fracturing on Drinking Water Resources. *EPA Report*, EPA 600/R-14/091a. 186 pp.
- Wolfe, A. L.**, Wilkin, R. T., Lee, T. R., **Ruybal, C. J.**, and Oberley, G. G. (2015b). Retrospective Case Study in the Raton Basin, Colorado: Study of the Potential Impacts of Hydraulic Fracturing on Drinking Water Resources, Appendices A - C. *EPA Report*, EPA 600/R-14/091b. 527 pp.

- Carter A. J., Durant A. J., Ramsey M. S., Skilling I. P., **Wolfe A. L.** (2009). Micron-scale roughness of volcanic surfaces from thermal infrared spectroscopy and scanning electron microscopy. *Journal of Geophysical Research: Solid Earth*, 114: B02213, 13 pp. (IF = 3.59)
- Liu, R., **Wolfe, A.L.**, Dzombak, D.A., Horwitz, C.P., Stewart, B.W., and Capo, R.C. (2009). Controlled Electrochemical Dissolution of Hydrothermal and Sedimentary Pyrite. *Applied Geochemistry*, 24(5): 836–842. (IF = 3.219)
- Liu, R., **Wolfe, A.L.**, Dzombak, D.A., Stewart, B.W., and Capo, R.C. (2008a). Comparison of Dissolution under Oxidic Acid Drainage Conditions for Eight Sedimentary and Hydrothermal Pyrite Samples. *Environmental Geology*, 56(1):171-182.
- Liu, R., **Wolfe, A.L.**, Dzombak, D.A., Horwitz, C.P., Stewart, B.W., and Capo, R.C. (2008b). Electrochemical Study of Hydrothermal and Sedimentary Pyrite Dissolution. *Applied Geochemistry*, 23(9): 2724–2734. (IF = 3.219)
- Wolfe, A.L.**, Liu, R., Stewart, B.W., Capo, R.C., and Dzombak, D.A. (2007). A method for generating uniform size-segregated pyrite particle fractions. *Geochemical Transactions*, 8:9.

In Preparation

(blue designates grad students/postdocs; red designates undergraduate students; IF = Impact Factor)

- Zuo, H.**, **Wolfe, A.L.**, and Dong, H.. (201X). The Role of Humic Substances in Abiotic Clay Mineral Transformation. To be submitted to: *Chemical Geology* (IF = 4.169)

INVITED TALKS

- Wolfe, A.L.** (2019). Potential Impacts of Hydraulic Fracturing on Drinking Water Resources: A Case Study in the Raton Basin, CO. University of Kentucky, Lexington, KY.
- Wolfe, A.L.** (2016). Oxidative Dissolution of Pyrite: A Combined Experimental and Iron Isotope Investigation. USGS Utah Water Science Center, Salt Lake City, UT.
- Wolfe, A.L.** (2010). Partitioning of Iron in Organic and Mineral Phases: Sequential Extractions of Bituminous Coal. University of Pittsburgh, Pittsburgh, PA.

INVITED WORKSHOPS

- Wolfe, A.L.** (2015). Development of Non-Traditional Stable Isotope Systems as an Exposure Tool to Explore Impacts of Geologic Materials and Processes on Animal and Human Health. ORD Post Docs Leading Innovation, Ideation Event. US EPA Office of Research and Development, Research Triangle, NC.

CONFERENCE CONTRIBUTIONS

Sessions convened/chaired

- Haneberg, W.C., Overfield, B., **Wolfe, A.L.**, Datta, S., and Finkelman, R.B.. (2018). From Local to Global-Why Geology Matters for Human Health. Geological Society of America (GSA) Annual Meeting, Indianapolis, IN. (Oral session). Role: Co-convenor
- Wolfe, A.L.**, and McLeod, C.M. (2018). Advances in Stable Isotope Geochemistry – Applications to Earth Science Systems. Geological Society of America (GSA) Annual Meeting, Indianapolis, IN. (Oral session). Role: Convener

CONFERENCE CONTRIBUTIONS, *continued***Oral Presentations**

- Wolfe, A.L.**, Liu, R., Stewart, B.W., Capo, R.C., and Dzombak, D.A. (2006). Oxidative dissolution of pyrite in the field and laboratory: A combined experimental and iron isotope investigation. Penn State Astrobiology Center Meeting, 2006. State College, PA.
- Wolfe, A.L.**, Stewart, B.W., Capo, R.C, Liu, R., and Dzombak, D. (2005). Modern and Ancient Sedimentary Pyrite: Geochemical and Iron Isotope Studies. (*Oral presentation and poster*) Penn State Astrobiology Center Meeting, 2005. State College, PA.

Poster Presentations

(*blue* designates grad students/postdocs; *red* designates undergraduate students)

- Binyam, D.B.**, Childers, C., Emrick, S., McLeod, C., **Haley, M.**, **Wolfe, A.L.**, and Hill, T. (2018). Mafic Enclaves from the Quillacas Volcanic Centre in the Bolivian Andes: Insights into Arc Magmatic Systems. Geological Society of America (GSA) Annual Meeting, Indianapolis, IN.
- Wolfe, A.L.**, and Wilkin, R.T., (2017). Evidence of Sulfate-Dependent Anaerobic Methane Oxidation within an Area Impacted by Coalbed Methane-Related Gas Migration. American Geophysical Union (AGU) Annual Meeting, New Orleans, LA.
- Angi-O'Brien, E.**, McLeod, C.M., **Haley, M.Y.**, **Brydon, R.**, **Wolfe, A.**, and Shaulis, B.. (2017). Magma Mingling: Unravelling Granite Crystallization One Crystal at a Time. Paper No. 274-17, Geological Society of America (GSA) Annual Meeting, Seattle, WA.
- Brydon, R.**, McLeod, C.M., **Haley, M.Y.**, **Wolfe, A.**, Brown, K., Shaulis, B, and Tronnes, R.. (2017). Breaking up a Continent: Timing and Sources of Granitoid Magmatism in the Oslo Rift, Norway. Paper No. 274-4, Geological Society of America (GSA) Annual Meeting, Seattle, WA.
- Haley, M.Y.**, McLeod, C.M., **Brydon, R.**, **Wolfe, A.**, Shaulis, B., and Tronnes, R.. (2017). Constructing Continental Crust: Tracking Petrogenesis of Granitic Batholiths of the Oslo Rift, Norway. Paper No. 154-9, Geological Society of America (GSA) Annual Meeting, Seattle, WA.
- Krekeler, M.P.S., **Dietrich, M.**, Vangala, S., Tully, J., Legalley, E., Argyilan, E.P., Burke, M., and **Wolfe, A.** (2017). Environmental Properties and Impacts of Nanoparticles in Urban Landscapes of the Midwest: Microscopy Studies of Street Sediment Demonstrate Cause for Concern. Paper No. 69-36, Geological Society of America (GSA) Annual Meeting, Seattle, WA.
- Dietrich, M.**, **Wolfe, A.**, Burke, M., Vangala, S., Argyilan, R.P., Legalley, E., and Krekeler, M.P.S.. (2017). A Preliminary Urban Geochemical Exploration of Street Sediments of Gary, Indiana Indicates Major Concerns Are Warranted. Geological Society of America (GSA) Joint 52nd Northeastern Annual Section / 51st North-Central Annual Section Meeting, Pittsburgh, PA.
- Vangala, S., **Dietrich, M.**, Burke, M., **Wolfe, A.**, Argyilan, E.P., and Krekeler, M.P.S.. (2017). A Preliminary Field Emission Scanning Electron Microscopy (FESEM) and Transmission Electron Microscopy (TEM) Foray into Street Sediment of Gary, Indiana: Major Environmental Health Concerns are Evident. Geological Society of America (GSA) Joint 52nd Northeastern Annual Section / 51st North-Central Annual Section Meeting, Pittsburgh, PA.
- Farrill, S.J.**, **Wolfe, A.L.**, and Wilkin, R. (2012). Synthesis and Characterization of Galena (PbS) and Orpiment (As₂S₃): Applications for Dissolution Experiments Conducted under Varying pCO₂ Conditions. McNair Scholars Program, East Central University, Ada, OK.
- Wolfe, A.L.**, Liu, R., Stewart, B.W., Capo, R.C. Dzombak, D.A. (2008). Iron Isotope Investigation of the Pyrite Lifecycle. Astrobiology Science Conference, Santa Clara, CA.

- Wolfe, A.L.**, Liu, R., Stewart, B.W., Capo, R.C., and Dzombak, D. (2006). Pyrite Dissolution Experiments: Production of Clean, Uniform Particle Size Fractions. Geological Society of America (GSA) Annual Meeting, Philadelphia, PA.
- Wolfe, A.L.**, Pellathy, S., Carter, J., and Grabowski, J. (2006). Rock On! A Hands-On Laboratory Experience Developed for Elementary School Science Specialists. Geological Society of America (GSA) Annual Meeting, Philadelphia, PA.
- Liu, R., **Wolfe, A.L.**, Dzombak, D.A., Stewart, B.W., and Capo, R.C. (2006). Rate and Extent of Dissolution of Various Sedimentary and Hydrothermal Pyrite Samples. American Chemical Society Fall National Meeting, San Francisco, CA.
- Liu, R., **Wolfe, A.L.**, Dzombak, D.A., Stewart, B.W., and Capo, R.C. (2005). Study of Pyrite Dissolution Rate and Extent for Various Sedimentary and Hydrothermal Pyrite Samples. American Society of Civil Engineers/Pittsburgh Geological Society Student Night, Pittsburgh, PA.
- Wolfe, A.L.**, Stewart, B.W., and Capo, R.C. (2005). Iron Isotope Investigation of Sedimentary Pyrite Associated with Coal Mine Discharges (AMD). American Geophysical Union (AGU) Annual Meeting, San Francisco, CA.
- Phillips, J T, **Wolfe, A.L.**, Baldwin, W.E., Gayes, P.T., Wright, E.E., and Harris, M.S. (2000). Holocene Stratigraphy of Pawleys Island South Carolina: A Sediment-Starved Barrier Island System. American Geophysical Union (AGU) Ocean Sciences Meeting, San Antonio, TX.

RESEARCH EXPERIENCE

- 2016 - Geochemistry Lab Manager**, Miami University (Oxford, OH)
- 2019** Collaborators: Tewodros Godebo (Tulane University), George Daly (MU), and Christine Rasoazanamparany (MU)
Research: Development of analytical techniques to 1) isolate and measure calcium isotopes in urine samples, in support of research to apply a Ca isotope biomarker to monitor the pathogenesis of skeletal fluorosis in populations exposed to high fluoride concentrations (*collaborator: T. Godebo*); 2) isolate and measure Pb isotopes in fertilizer using thermal ionization mass spectrometry (*collaborator: Daly*); 3) assess the potential impacts of metal mining within eastern Madagascar on water resources and local communities (*collaborator: Rasoazanamparany*); and 4) understand the generation of glycol compounds from additives used in HVAC systems.
- 2015 - Hydrogeochemist**, CSS Dynamac (Ada, OK)
- 2016** Collaborator: Rick T. Wilkin
Research: Evidence of sulfate-dependent anaerobic methane oxidation within an area impacted by extensive coalbed methane-related gas migration; the production of tert – butyl alcohol (TBA) in ground water during development of unconventional gas resources
- 2011 - Postdoctoral Fellow**, US EPA, National Risk Management Research Laboratory
2015 Ground Water and Ecosystem Restoration Division (Ada, OK)
 Postdoc Advisor: Rick Wilkin
Research: Retrospective case study in the Raton Basin, CO: a study of the potential impacts of hydraulic fracturing on drinking water resources; ground water sampling at hazardous waste sites; dissolution behavior of galena (PbS) and orpiment (As₂S₃) under varying pCO₂ conditions

- 2004 - **Research Intern**, Hedin Environmental (Pittsburgh, PA)
 2005 Supervisor: Bob Hedin
Research: Investigated and quantified the removal capacity of iron oxide samples collected from passive water treatment ponds for selenate, phosphate, and arsenate; evaluated flow dynamics of a passive treatment system using a KBr tracer
- 2002 - **Graduate Student Researcher**, University of Pittsburgh (Pittsburgh, PA)
 2010 Advisor: Brian W. Stewart, Department of Geology & Planetary Science
Research: An experimental and isotopic investigation of the oxidative dissolution of pyrite
- 2001 - **Hydrology Intern**, U.S. Forest Service (Columbia, SC)
 2002 Supervisor: Bill Hansen (Francis Marion and Sumter National Forests)
Research: Indian Creek Hydrologic Conditions Analysis, Enoree Ranger District, Sumter National Forest, Columbia, SC. *Awarded the USFS Scout Award.*

TECHNICAL EXPERIENCE

Analytical

Inductively Couple Plasma – Optical Emission Spectroscopy (ICP-OES), Inductively Couple Plasma – Mass Spectroscopy (ICP-MS), Thermal Ionization Mass Spectrometry (TIMS), X-Ray Diffraction (XRD), Scanning electron microscopy/x-ray microanalysis (SEM/EDS), Ion Chromatography (IC/HPIC), Accelerated Solvent Extraction (ASE), Atomic Adsorption (AA), Accelerated Solvent Extraction Systems (ASE), nitrogen adsorption analysis for surface area (Quantachrome), optical microscopy (binocular and petrographic microscopes), ion exchange chromatography, wet sample digestion, method development.

Computational

Advanced use of industry-standard software tools including ArcGIS, Geochemist's Workbench, Origin Pro, PhreeqC, QGIS, RockWorks (Rockware, Inc), and Visual Minteq.

TEACHING EXPERIENCE

- 2016 - Miami University (Oxford, OH)
 2019 **Guest Lecturer:** Introductory Seminar for Geology and Environmental Earth Science; Chemistry of Earth Systems; Mineralogy; Geomicrobiology; Isotope Geochemistry; Isotopes in Environmental Processes
- 2003 - University of Pittsburgh (Pittsburgh, PA)
 2010 **Course Instructor:** Mineralogy, The Planets
Lab Instructor: Igneous & Metamorphic Petrology, Mineralogy
Teaching Assistant: Geology, Environmental Geology, Ground Water Geology, Intelligent Life in the Universe, Physical Geography
- 2004 - Knoxville Elementary School, 3rd – 5th grade science (Pittsburgh, PA)
 2005 NSF-GK 12 Program: The Pittsburgh Partnership for ENERGIZing Science in Urban Schools

EDUCATION CONTRIBUTIONS**Workshops convened**

- Wolfe, A.L.**, Pellathy, S., Carter, J., and Grabowski, J. (2005). Rock On!: A Teacher In – Service Earth Science Workshop for Pittsburgh Public School Science Education Specialists. University of Pittsburgh, Pittsburgh, PA. *Role*: Co-organizer. *Audience*: K-8 Science Teachers, Pittsburgh Public School District.
- Wolfe, A.L.**, and Scheidt, S.P. (2005). Geohazards: Tsunami!. Pennsylvania Junior Academy of Science Workshop Series, University of Pittsburgh, Pittsburgh, PA. *Role*: Organizer, and Co-Instructor. *Audience*: High School Students, PJAS Region 7 (Allegheny & Westmoreland Counties).
- Wolfe, A.L.**, Lee, R., and LaMoreaux, K.. (2005). Do You Wanna Drink It? Pennsylvania Junior Academy of Science Workshop Series, University of Pittsburgh, Pittsburgh, PA. *Role*: Organizer. *Audience*: High School Students, PJAS Region 7 (Allegheny & Westmoreland Counties).
- Wolfe, A.L.**. (2004). Ocean Science: Dive – In!. Pennsylvania Junior Academy of Science Workshop Series, University of Pittsburgh, Pittsburgh, PA. *Role*: Organizer, and Instructor. *Audience*: High School Students, PJAS Region 7 (Allegheny & Westmoreland Counties).
- Wolfe, A.L.**, and Byrnes, J. (2003). Tour of the Solar System through Hands – on Activities. Pennsylvania Junior Academy of Science Workshop Series, University of Pittsburgh, Pittsburgh, PA. *Role*: Organizer, and Co-Instructor. *Audience*: High School Students, PJAS Region 7 (Allegheny & Westmoreland Counties).

STUDENT MENTORING

- 2016** - Trained, supervised, and assisted 42 individuals (undergraduates (7), graduate students (M.S. (19), PhD (11)), postdoctoral researchers (4), technicians (2)) in laboratory activities (e.g., research project assistance, lab procedures, analytical techniques, data analysis, safety protocols) and instrument training/usage. Trained, supervised, and assisted 3 individuals (graduate students (2 - M.S., 1 - PhD) in field activities (i.e., surface water sampling (for metal analyses), and safety protocols).
- 2012** Skylar Farrill, B.S. (Biology; 2012), East Central University (Ada, OK)
2012 McNair Scholars Internship Program
Research: Synthesis and Characterization of Galena (PbS) and Orpiment (As₂S₃): Applications for Dissolution Experiments Conducted under Varying pCO₂ Conditions
- 2011** - EPA Student Contractor Program (Ada, OK)
- 2015** *Activities*: Field - field sampling preparation, ground water sampling (including hazardous waste sites); Lab - research project assistance, including lab procedures, instrument training, and safety protocols

OTHER ACADEMIC ACTIVITIES**Masters Degree Committees (Completed)**

- Rachel Snyder (M.En., Institute of Environmental Sustainability (IES), Miami Univ., 2019)
Impact of urban and agricultural land use on base flow sediment and nutrient concentrations in SW Ohio streams.

PROFESSIONAL MEMBERSHIPS

American Geophysical Union, International Medical Geology Association, Geological Society of America, The Ohio Academy of Science

SERVICE

Professional Organizations

Co-Chair, GeoHealth Communications & Engagement Subcommittee, American Geophysical Union

Peer Reviewer for Academic Journals

Geochimica et Cosmochimica Acta, Journal of Contaminant Hydrology

Peer Reviewer for Conference Abstracts

- 2019 Ohio Academy of Science Annual Meeting (2019), Columbus State Community College, Columbus, OH
- 2018 Ohio Academy of Science Annual Meeting (2018), Bowling Green University, Bowling Green, OH

Grant Reviewer

- 2018 Melvin Scholar Program (Ohio Academy of Science), Ohio EPA Scholarship Program
- 2017 Melvin Scholar Program (Ohio Academy of Science), Ohio EPA Scholarship Program
- 2015 DOD/EPA/DOE Strategic Environmental Research and Development Program (SERDP): Proposal Review Panel. *Topic:* Measurement and Enhancement of Abiotic Attenuation Processes in Groundwater
- 2012 U.S. EPA STAR Fellowship, Proposal Review Panel. *Topic:* Safe and Sustainable Water Resources: Drinking Water
- 2012 U.S. EPA STAR Fellowship, Proposal Review Panel. *Topic:* Safe and Sustainable Water Resources: Water Quality - Coastal and Estuarine Processes

Student Poster & Presentation Judge

- 2018 Ohio Academy of Science State Science Day, Judge
- 2014 Oklahoma State Science & Engineering Fair, Judge
- 2013 Oklahoma State Science & Engineering Fair, Judge

Science Olympiad

- 2020 Event Supervisor (and exam writer), Division C – Geologic Mapping: Northeastern Ohio Regional Tournament
- 2019 Event Supervisor (and exam writer), Division C – Geologic Mapping: Northeastern Ohio Regional Tournament
- 2018 Exam Writer, Division C - Remote Sensing: Northeastern Ohio Regional Tournament