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ResearcherID/Publons: <https://www.researcherid.com/rid/B-4871-2010>
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ResearchGate: https://www.researchgate.net/profile/John_Ayers/

EDUCATION

| | | |
|------------|---|------|
| PhD | Rensselaer Polytechnic Institute, Geology | 1991 |
| | Dissertation: "Experimental studies of the chemistry of aqueous fluid-accessory mineral systems at high P-T conditions with implications for fluid-rock interactions" | |
| | Advisor: E. Bruce Watson | |
| MS | The Pennsylvania State Univ, Geochemistry and Mineralogy | 1988 |
| | Thesis: "Partitioning of elements between silicate melt and salt water at mantle conditions" | |
| | Advisor: David Egger | |
| BS | SUNY College at Fredonia, Geochemistry & Geology | 1985 |

ACADEMIC POSITIONS

| | |
|--|-----------|
| Professor, Vanderbilt University Dept. of Earth and Environmental Sciences | 2006- |
| Professor, Vanderbilt University Dept. of Civil and Environmental Engineering | 2006- |
| Chair, Vanderbilt University Dept. of Earth and Environmental Sciences | 2011-2014 |
| Interim Chair, Vanderbilt University Dept. of Earth and Environmental Sciences | 2022- |
| Associate professor, Vanderbilt University | 1998-2006 |
| Assistant Professor | 1991-1998 |

PROFESSIONAL EXPERIENCE

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|---|-----------|
| Board certified environmental scientist, AAEEES | 2016-2020 |
| Registered Professional Geologist, State of Tennessee | 1999-2014 |
| GIS consultant, ERS Group | 2006-2011 |
| Student aid, NY Dept. of Law, Environmental Protection Bureau | 1989-1990 |

HONORS AND AWARDS

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|--|------|
| Fellow, Geological Society of America | 2017 |
| Fellow, Mineralogical Society of America | 2014 |
| Mineralogical Society of America Biennial Research Grant | 1990 |
| SUNY Fredonia MacDiarmid Award (Outstanding Student) | 1984 |
| SUNY Fredonia Fahnestock Scholarship (Field School) | 1984 |
| New York State Regents Scholarship | 1981 |

RESEARCH EXPERIENCE

Early career: experimental petrology and high-temperature geochemistry

Mid-career: metamorphic petrology field work in China and the western US, low-temperature geochemistry in Bangladesh

Late career: low temperature geochemistry, water and soil quality, sustainability

Post-doctoral students

Yan Luo 2006-2007
Blake Wallrich 2022-

Visiting Professors

Xiaomei Wang, China University of Geosciences, Wuhan, China 2014-2015
Xiaoming Liu, Northwest University, Xi'an, China 2007, 2013
Osvaldo Rabbia, Universidad de Concepcion, Chile 2000

Doctoral Students Advised (No EES PhD program until 2015)

Matthew Dietrich, Earth & Environmental Sciences, "Heavy metal soil-water partitioning and bioavailability in Southwest Bangladesh" 2017-2021
Moyo Ajayi, Environmental Engineering, "Investigations into methane and carbon dioxide emissions, sources, and pathways in Quaternary volcanic calderas in the western United States" 2016-2021
Tim Peters, Environmental Engineering, "Experimental and Field Based Investigations into the Behavior of Zircon in Hydrothermal and Deep-Tectonic Environments during Mountain-Building and Crustal-Evolution Events" 2006-2012

Masters Students Advised

Ken Rahman, "Continuous monitoring of particulate matter pollution" 2021
Brooke Patton, "The Effect of Irrigation Source on Arsenic and Salt Concentrations in Soil in Southwest Bangladesh" 2018
Moyo Ajayi, "Geochemical and Isotopic Analysis of Escaped Natural Gases in Hydraulically Fractured and non-Fractured sites in UT Cumberland Forest, Tennessee" 2016
David Fry, "Characterizing temporal and spatial trends in soil geochemistry on Polder 32, Southwest Bangladesh" 2015
Nathan Katsiaficas, "Using accessory mineral geochronology to identify soil provenance in middle Tennessee" 2014
Greg George, "Characterization of salinity sources in southwestern Bangladesh evaluated through surface water and groundwater geochemical analyses" 2013
Scott Crombie, "Monazite alteration in the Searchlight Contact Metamorphic Aureole, Southern Nevada" 2006
Lichun Zhang, "Zircon solubility in alkaline aqueous solutions and trace element partitioning between zircon and fluids" 2006
Stephen Lehner, "Synthesis and experimental study of oxidation rate of arsenian pyrite", co-advised with Kaye Savage, 2004
Miranda Loflin, "Monazite as a tracer of fluid infiltration associated with contact metamorphism" 2002

- Betsy Gorisch, “Paragenetic and geochronological characteristics of monazite, based on experimental investigations with applications to naturally occurring metamorphic rocks”, co-advised with Calvin Miller 1999
- Delores Robinson, “Investigating magma chamber dynamics through the examination of accessory minerals: The Aztec Wash pluton, Southern Nevada”, co-advised with Calvin Miller 1997
- Carol Davis, “Geologic controls on contaminant movement in a carbonate aquifer system: Arnold Air Force Base, South-Central Tennessee” 1996
- Sondra Dittmer, “Element partitioning between peridotite assemblage minerals and H₂O at 2.0-3.0 GPa and 900-1100°C” 1995
- Theodore Larrieu, “Experimental determination of the pressure-volume-temperature properties of water to 20 kbars and 1000°C” 1995

Undergraduate Students: Senior Honors Thesis Advisor

- Hannah Zanibi, “Assessing Diel Variations in Stream Hydrochemistry within the Harpeth River Watershed, TN” 2021
- Anica Sunshine, “Water quality impacts of a sustainable development at Sterling Ranch, CO” 2016
- Sarah Walker, “Assessing the life cycle impacts of conventional and organic beef in the United States” 2012
- Kelsey Bitting, “Drinking water and reservoir water quality in the area of Coffee and Franklin Counties, TN” (VUSR) 2004
- Katy Huntze, “Fluid-assisted monazite recrystallization: effects on internal zoning and implications for Th-Pb age dating” 2001
- Stacie Dunkle, “Imaging and Age Dating of Zircons from the Ultra-High Pressure Terrane of Dabie Shan, China” 2000
- Kevin Giles, “The Effect of Fluid Interconnectivity on Monazite Growth in Fluid-bearing Quartzite” 2000
- John Milleman, “Hydrothermal growth kinetics of monazite; with application to age determination” 1998
- Also advised Hyen Sung, Daric Georgiades and Katie DeLaCruz on projects.

High School Students: Research Advisor

- Elise Russ, Research Experience for High School Students 2019
- Jeong Hyun (Jenna Nam), Research Experience for High School Students 2014
- Camille Lasley, Research Experience for High School Students 2013
- Brittainy Tidwell, Vanderbilt School for Science and Math 2010
- Culley Sharp, VCSO Research Internship Program 2009
- Annalyse Moncrief, Hume Fogg, VCSO Research Internship Program 2007
- Jason Cox, Hunters Lane, VCSO Research Internship Program 2006
- Kathleen Goetz, Harpeth Hall (Won 1st prize in Middle Tenn. Science Fair) 2004-2005
- Oran Switzer, Martin Luther King Science Magnet 1994-1995

High School Students: Senior Thesis Mentor

- Lawson Ransburgh, Central Magnet High School 2018-2019

PhD Committees

| | |
|--|-----------|
| Siyuan Yu, Environmental Engineering | 2022- |
| Autumn Taylor, Environmental Engineering | 2021- |
| Xinyue Wang, Environmental Engineering | 2020-2022 |
| Peng Zhang, Environmental Engineering | 2020-2021 |
| Maria Rosa Schicchitano, ANU Research School of Earth Sciences | 2018 |
| Matthew Dietrich (Advisor), EES | 2017-2021 |
| Jessica Raff, EES | 2017- |
| John Boren, Environmental Engineering | 2017- |
| Moyo Ajayi (Advisor), Environmental Engineering | 2016- |
| Nathan Barnes, Environmental Engineering | 2016-2020 |
| Chelsea Peters, Environmental Engineering | 2014-2019 |
| Tenley Banik, Environmental Science | 2013-2015 |
| Laura Benneyworth, VCEMS | 2011-2016 |
| Susanne McDowell, Environmental Science | 2010-2014 |
| Josh Arnold, Environmental Engineering | 2008-2014 |
| Tim Peters (Advisor), Environmental Science | 2006-2012 |
| Lily Claiborne, Environmental Science | 2008-2011 |
| Sonali Shukla, Physics | 2006-2009 |
| Stephen Lehner, Environmental Science | 2005-2007 |
| Sarynna Lopez, Environmental Engineering | 2004-2006 |

TEACHING EXPERIENCE AT VANDERBILT UNIVERSITY

| | |
|---|---|
| Environmental Geology | 1999-2006 |
| Physical Geology | 1992-1994 |
| Freshman Seminar, Controversies in the Geosciences: Science and Environment | 1994-1998 |
| Freshman Writing Seminar, Sustainability: An Environmental Science Perspective | 2009, 2012 |
| Petrology | 2006-2008 |
| Environmental Geochemistry | 2003 |
| Geochemistry | 1998, 2000-2, 2004, 2006-9, 2011-13, 2015-18, 2020 |
| Geochemistry Lab | 2006-2008 |
| Computer Methods in Geology | 1992-1997 |
| Sustainability Science | 2010, 2013, 2015, 2017-2020 |
| The Commons: History, Sustainability, Activism (co- taught with English Professor Dana Nelson) | 2012 |
| Aqueous Geochemistry | 1991, 1994-2002, 2005, 2009 |
| Environmental Applications of Geochemical Modeling | 2003-4, 2007, 2020 |
| Advanced Geochemistry (seminar) | 2005 |
| Geochemistry of the Early Earth | 2008 |
| Senior Honors seminar | 2020-2022 |

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| Natural Resources | 2019, 2022 |
| Special Topics and Advanced Techniques: Mineralogy and Geochemistry | 2016 |

UNIVERSITY AND DEPARTMENTAL SERVICE

Leadership, Department of Earth and Environmental Sciences

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|---------------------------------|----------------------|
| Interim Department Chair | 2022-2023 |
| Department Chair | 2011-2014 |
| Director of Graduate Studies | 1994-1998, 2005-2009 |
| Speakers Chair | 1998-2007 |
| Chair, Faculty Search Committee | 2004, 2018 |

Committees

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| Awards Committee, Carl E. Adams Graduate Student Best Paper Award Competition for the Environmental Engineering Graduate Program | 2020 |
| Cornelius Vanderbilt Scholarship Admissions Committee | 2019-2021 |
| EES Faculty search committee | 2017-2018 |
| Discovery Grant Program internal-review committee | 2014, 2016 |
| Senior Advisory Review Committee (Promotion and tenure), College of A&S | 2009, 2013 |
| Junior Advisory Review Committee, College of A&S | 2008 |
| Task Force on Graduate Education | 2008-2009 |
| Environmental Science Option Program Advisory Committee | 2005-2009 |
| CPC Subcommittee on Natural Science | 1997-2006 |
| Environmental Science Ph.D. Curriculum Committee | 2003–2005 |
| Leadership Committee, Vanderbilt Institute for Environmental Risk and Resources Management | 2002-2003 |
| Search committee member for EES chair | 2002-2003 |
| Strategic Planning Committee, College of Arts and Science, Caucuses 4 and 5 | 2001 |

Other Service

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|---|---------------------------------|
| Faculty advisor, Earth & Environmental Science Graduate Student Association | 2022- |
| EES undergraduate major advisor | 2018- |
| Faculty Marshall | 2009-2010 |
| Faculty Fellow, Sigma Phi Epsilon fraternity | 2008-2009 |
| Vanderbilt Center for Teaching Panelist, "Students as Producers: Incorporating research and design into STEM classes" | 2013 |
| Two panel presentations for Vanderbilt Office of Active Citizenship and Service ECO Rolling Seminar | 2010 |
| Led a Center for Teaching Workshop on Teaching Sustainability | 2010 |
| Adventure Science Museum, Vanderbilt's Center for Science Outreach | 2005 |
| Invited to speak to Vanderbilt Mayfield #3 | 2004 |
| Graduate Faculty Assembly Delegate | 1993-1994, 1999-2001, 2004-2009 |
| Department Computer Coordinator | 1991-1999 |

Books

Ayers JC (2017) Sustainability: An Environmental Science Perspective. Taylor & Francis Group, CRC Press, 322 pages, ISBN 9781498752657, <https://www.amazon.com/Sustainability-Environmental-Perspective-John-Ayers/dp/1498752659>

Book chapters

Ayers, JC (2014) Why I Chose to Work in the Field of Environmental Geology. Chpt. 5 in [*Environmental Science and Studies for the Curious: Top Professors' Perspectives on College/University Major, Scholarships, Research Issues, and Career Options*](#), ed. Vaidya K..

Ayers JC, Watson EB (1991) Solubility of apatite, monazite, zircon and rutile in supercritical aqueous fluids with implications for subduction zone geochemistry. In *Fluids in Subduction Zones*, eds. Tarney J., Pickering K.T., Knipe R.J., Dewey J.F., pp. 139-150, The Royal Society, University Press, Cambridge.

Meen JK, Ayers JC, Fregeau EJ (1989) A model of mantle metasomatism by carbonated alkaline melts: trace-element and isotopic composition of mantle source regions of carbonatite and other continental igneous rocks. In *Carbonatites: Origin and Evolution* (K. Bell, ed.), pp. 464-499, George Allen and Unwin, London.

Journal Publications

Raff J, Pickering J, Gilligan J, Ayers JC, Goodbred S (submitted) Sediment delivery to the Bengal delta under anthropogenic climate change. *Nature Climate Change*.

Fan M, Liu X, Dong Y, Ayers JC (submitted) Effect of chemical composition on Raman spectroscopy: Investigation of synthetic zircon. *Ore Geology Reviews*.

41. Gruber C, Steen M, Brown KG, Delapp R, Matteo E, Klein-BenDavid O, Bar-Nes G, Meeussen H, Ayers JC, Kosson DS (2022) Cement-carbonate rock interaction under saturated conditions: from laboratory to modelling. *Cement and Concrete Research* 160:106899. <https://doi.org/10.1016/j.cemconres.2022.106899>

40. Dietrich M, Ayers JC (2022) Element transport and partitioning along tidal channels in Southwest Bangladesh. *Estuaries and Coasts*. <https://link.springer.com/article/10.1007/s12237-022-01082-w>

39. Ayers JC, Flanagan D, Ackerson M, Wallrich B, Miller CF, Watson EB, Ryerson FJ (2022) The solubility of titanite in silicate melt determined from growth and dissolution experiments. *Contributions to Mineralogy and Petrology* 177:37. 15 pp. <https://doi.org/10.1007/s00410-022-01902-z>

38. Dietrich M, Ayers JC (2021) Influences on tidal channel and aquaculture shrimp pond water in Southwest Bangladesh. *Geochemical Transactions* 22:2. <https://doi.org/10.1186/s12932-021-00074-2>

37. Dietrich M, Ayers JC (2021) Geochemical cycling, partitioning, and possible heavy metal(loid) bioaccumulation within aquaculture shrimp ponds. *Science of the Total Environment* 788, 147777. <https://doi.org/10.1016/j.scitotenv.2021.147777>
36. Ajayi M, Ayers JC (2021) CH₄ and CO₂ diffuse gas emissions before, during, and after a Steamboat Geyser eruption. *Journal of Volcanology and Geothermal Research* 414, 107233. <https://www.sciencedirect.com/science/article/pii/S0377027321000627>
35. Ayers JC, Patton B, Dietrich M (2020) Preliminary Evidence of Transport-Limited Chemical Weathering and Element Immobility in the Ganges Tidal Delta Plain of Bangladesh. *Geochemistry, Geophys Geosystems* 21:e2020GC009029. <https://doi.org/10.1029/2020GC009029>
34. Wang X, Katsiaficas N, Nam JH, Lasley C, Liu X, Ayers JC (2020) Evaluation of zircon U-Pb geochronology as a tool to determine soil provenance in a limestone terrane, Middle TN, USA. *Chemical Geology V. 536, 20 March 2020, 119465*. <https://doi.org/10.1016/j.chemgeo.2020.119465>
33. Zhang F, Wang Y-B, Dua L-L, Yang C-H, Ayers JC, Yuan H-Q (2019) The Neoproterozoic-Paleoproterozoic volcanic-sedimentary rocks in the Zanhuang Complex, North China Craton: Petrogenesis and implications for tectonic evolution. *Precambrian Research*, v. 328, pp. 64-80. <https://doi.org/10.1016/j.precamres.2019.03.015>
32. Ayers JC, Peters T (2018) Zircon/fluid trace element partition coefficients measured by recrystallization of Mud Tank zircon at 1.5 GPa and 800-1000°C. *Geochim. Cosmochim. Acta V. 23, pp. 60-74*. <http://dx.doi.org/10.1016/j.gca.2017.11.025>
31. Pickering JL, Beam JC, Covey AK, Ayers JC, Goodbred SL (2018) Landform evolution of Late Pleistocene to recent terraces of the Brahmaputra-Jamuna River in the upper Bengal Basin. *Basin Research, V. 30, Issue S1, pp. 550-567*, DOI: [10.1111/bre.12236](https://doi.org/10.1111/bre.12236)
30. Ayers JC, George G, Fry D, Benneyworth L, Wilson C, Wallace Auerbach L, Roy K, Karim MR, Akter F, Goodbred SL (2017) Salinization and Arsenic Contamination of Surface Water in Southwest Bangladesh. *Geochemical Transactions*, 18:4, 23 pages, <https://doi.org/10.1186/s12932-017-0042-3>
29. Ayers JC, Goodbred SL, George G, Fry D, Benneyworth L, Hornberger G, Roy K, Karim MR, Akter F (2016) Sources of Salinity and Arsenic in groundwater in Southwest Bangladesh. *Geochemical Transactions*, doi:10.1186/s12932-016-0036-6, <http://www.geochemicaltransactions.com/content/17/1/4>
28. Benneyworth L, Gilligan J, Ayers JC, Carrico A, George G, Karim MD, Akter F, Fry D, Goodbred S, Donato K, Piya B (2016) Drinking water insecurity: water quality and access in coastal Southwestern Bangladesh. *International Journal of Environmental Health Research*, DOI: [10.1080/09603123.2016.1194383](https://doi.org/10.1080/09603123.2016.1194383)
27. Ayers JC, Bryant DL, Giles K (2015) Effect of fluid composition on monazite solubility and growth rate at 1.0 GPa and 1000°C. *American Mineralogist*, v. 100, no. 11-12, pp. 2579-2589. <http://dx.doi.org/10.2138/am-2015-5345>
26. Goudie DJ, Fisher CM, Hanchar JM, Davis WJ, Crowley JL, Ayers JC (2014) Simultaneous in situ determination of U-Th-Pb and Sm-Nd isotopes in monazite by laser ablation ICP-MS. *Geochemistry, Geophysics, Geosystems (G-cubed)*, 26 pp., DOI 10.1002/2014GC005431, <http://onlinelibrary.wiley.com/doi/10.1002/2014GC005431/abstract>
25. Ayers JC, Crombie S, Loflin M, Miller CF, Luo Y (2013) Country rock monazite response to intrusion of the Searchlight pluton, southern Nevada. *Amer. Jour. Science*, v.

- 313, pp. 345-394. DOI 10.2475/04.2013.04,
<http://www.ajsonline.org/cgi/content/abstract/313/4/345?etoc>
24. Peters T, Ayers JC, Gao S, Liu X (2013) The response of zircon in eclogite to metamorphism during the multi-stage evolution of the Huwan Shear Zone, China: Insights from Lu-Hf-U-Pb isotopic and trace-element geochemistry. *Gondwana Research*, v. 23, Issue 2, March 2013, pp. 726–747
<http://dx.doi.org/10.1016/j.gr.2012.05.008>.
 23. Ayers JC, Zhang L, Luo Y, Peters T (2012) Solubility of zircon in neutral to alkaline aqueous fluids at upper crustal conditions. *Geochim. Cosmochim. Acta*. v. 96, 18-28.
<http://dx.doi.org/10.1016/j.gca.2012.08.027>.
 22. Rabbia OM, Hernández LB, French DH, King RW and Ayers JC (2009) The El Teniente porphyry Cu-Mo deposit from a hydrothermal rutile perspective. *Mineralium Deposita*, v. 44, pp. 849-866. <http://dx.doi.org/10.1007/s00126-009-0252-4>
 21. Luo Y, Ayers JC (2009) Experimental measurements of zircon/melt trace element partition coefficients. *Geochim. Cosmochim. Acta* v. 73, 3656-3679.
<http://dx.doi.org/10.1016/j.gca.2009.03.027>
 20. Luo Y, Sun M, Zhao G, Li S, Ayers JC, Xia X, Zhang J (2008) A comparison of U-Pb and Hf isotopic compositions of detrital zircons from the North and South Liaohe Groups: Constraints on the evolution of the Jiao-Liao-Ji Belt, North China Craton. *Precambrian Research* v. 163, 279-306.
 19. Ayers JC, Loflin M, Miller CF, Barton MD, Coath C (2006) In situ oxygen isotope analysis of monazite as a monitor of fluid infiltration during contact metamorphism: Birch Creek Pluton aureole, White Mountains, eastern California. *Geology* v. 34(8), 653-656. doi: [10.1130/g22185.1](https://doi.org/10.1130/g22185.1)
 18. Lehner SW, Savage K, Ayers JC (2006) Vapor growth and characterization of pyrite (FeS₂) doped with Co, Ni, and As: Variations in semiconducting properties. *Journal of Crystal Growth*, v. 286, 306-317. doi: [10.1016/j.jcrysgro.2005.09.062](https://doi.org/10.1016/j.jcrysgro.2005.09.062)
 17. Gao S, Rudnick RL, Yuan H-L, Liu X-M, Liu Y-S, Ling W-L, Ayers JC, Wang X-C (2004) Recycling lower continental crust. *Nature* **432**, 892-897. doi: [10.1038/nature03162](https://doi.org/10.1038/nature03162)
 16. Bryant DL, Ayers JC, Gao S, Zhang H, Miller C (2004) Geochemical, age, and isotopic constraints on the location of the Sino-Korean/Yangtze suture and Evolution of the northern Dabie Shan, China. *GSA Bulletin* **116** (5/6), 698-717. doi: [2610.1130/B25302.2](https://doi.org/2610.1130/B25302.2)
 15. Ayers JC, DeLaCruz K, Miller CF, Switzer O (2003) Experimental study of the growth kinetics of zircon in quartzite ± H₂O at 1.0 GPa and 1000°C, with implications for geochronological studies of high-grade metamorphism. *American Mineralogist* **88**, 365-376.
 14. Ayers JC, Dunkle S, Gao S, Miller C (2002) Triassic zircon U-Pb and monazite Th-Pb ages recorded in Maowu ultramafics and Shuanghe jadeite quartzite, Dabie Shan UHP belt, east-central China. *Chemical Geology* **186**, 315-331. doi: [10.1016/S0009-2541\(02\)00008-6](https://doi.org/10.1016/S0009-2541(02)00008-6)
 13. Townsend KJ, Miller CF, D'Andrea JL, Ayers JC, Harrison TM, Coath CD (2001) Monazite paragenesis in the Ireteba granite, southern Nevada: Geochronological implications. *Chemical Geology* **172**, 95-112. doi: [10.1016/S0009-2541\(00\)00238-2](https://doi.org/10.1016/S0009-2541(00)00238-2)
 12. Miller CF, Hatcher RD Jr., Ayers JC, Coath CD, Harrison TM (2000) Zircon age and inheritance of eastern Blue Ridge plutons, Southwestern North Carolina and Northeastern

- Georgia, with implications for magma genesis and evolution of the Southern Appalachian Orogen, *American Journal of Science* **300**, 142-172.
11. Ayers JC, Miller CF, Gorisch EB, Milleman J (1999) Textural development of monazite during high-grade metamorphism: Implications for U,Th-Pb age dating. *American Mineralogist* **84**, 1766-1780. <http://ammin.geoscienceworld.org/cgi/reprint/84/11-12/1766>
 10. Ayers JC (1998) Trace element modeling of aqueous fluid – peridotite interaction in the mantle wedge of subduction zones. *Contributions to Mineralogy and Petrology* **132**, 390-404. doi: [10.1007/s004100050431](https://doi.org/10.1007/s004100050431)
 09. Ayers JC, Dittmer SK, Layne GD (1997) Partitioning of elements between peridotite and H₂O at 2.0-3.0 GPa and 900-1100°C, and application to models of subduction zone processes. *Earth and Planetary Science Letters* **150**, 381-398. doi: [10.1016/S0012-821X\(97\)00096-4](https://doi.org/10.1016/S0012-821X(97)00096-4)
 08. Larrieu TL, Ayers JC (1997) Measurements of the pressure-volume-temperature properties of fluids to 20 kbars and 1000°C: A new approach demonstrated on water. *Geochimica et Cosmochimica Acta* **61**, 3121-3134. doi: [10.1016/S0016-7037\(97\)00155-5](https://doi.org/10.1016/S0016-7037(97)00155-5)
 07. Ayers JC, Eggler DH (1995) Partitioning of elements between silicate melt and H₂O-NaCl fluids at 1.5 and 2.0 GPa pressure: Implications for mantle metasomatism. *Geochimica et Cosmochimica Acta* **59**, 4237-4246. doi: [10.1016/0016-7037\(95\)00244-T](https://doi.org/10.1016/0016-7037(95)00244-T)
 06. Ayers JC, Watson EB (1993) Apatite/fluid partitioning of rare earth elements and strontium: experimental results at 1.0 GPa and 1000°C and application to models of fluid/rock interaction. *Chemical Geology* **110**, 299-314. doi: [10.1016/0009-2541\(93\)90259-L](https://doi.org/10.1016/0009-2541(93)90259-L)
 05. Ayers JC (1993) Partitioning and mass balance relations in lherzolites. *Chemical Geology* **107**, 19-27. doi: [10.1016/0009-2541\(93\)90099-5](https://doi.org/10.1016/0009-2541(93)90099-5)
 04. Ayers JC, Watson EB (1993) Rutile solubility and mobility in supercritical aqueous fluids. *Contributions to Mineralogy and Petrology* **114**, 321-330. doi: [10.1007/BF01046535](https://doi.org/10.1007/BF01046535)
 03. Ayers JC, Brenan JB, Watson EB, Wark DA, Minarik WG (1992) A new capsule technique for hydrothermal experiments using the piston cylinder apparatus. *American Mineralogist* **77**, 1080-1086.
 02. Ayers JC, Watson EB (1991) Solubility of apatite, monazite, zircon and rutile in supercritical aqueous fluids with implications for subduction zone geochemistry. *Philosophical Transactions Royal Society of London A*, **335**, pp.365-75. <http://links.jstor.org/sici?sici=0962-8428%2819910515%29335%3A1638%3C365%3ASOAMZA%3E2.0.CO%3B2-%23>
 01. Meen JK, Eggler DH, Ayers JC (1989) Evidence for very low solubility of REE in CO₂-rich fluids at mantle conditions. *Nature* **340**, 301-303.

Reports

Gruber C, Steen M, Brown KG, Delapp R, Taylor A, Ayers JC, Kosson DS, Matteo M, Klein-BenDavid O, Bar-Nes G, Meeussen JCL (2020) “Cement-Carbonate Rock Interaction Under Saturated Conditions: From Laboratory to Modeling. Nuclear Research Center of the Negev, Israel”.

Ayers JC, Rubin P (1990) “Geochemistry and Hydrogeology of Sand Volcano Effluents in Tully Valley, New York”. Environmental Protection Bureau, New York State, 112 pp.

Encyclopedia Entries

Ayers JC, Goodbred SL (2017) Arsenic Contamination in South and Southeast Asia. *Oxford Bibliographies in Environmental Science*. Ed. Ellen Wohl. New York: Oxford University Press, 2017/10/25. <https://doi.org/10.1093/obo/9780199363445-0087>

Hornberger GM, **Ayers JC** (2014) Hydraulic Fracturing in the Development of Unconventional Hydrocarbon Resources. In *Oxford Bibliography Online, Environmental Science*. New York: Oxford University Press.

<http://dx.doi.org/10.1093/obo/9780199363445-0006>

Ayers, J C (2012) Sands and Silica. In: Vasey, D. E., Fredericks, S. E., Lei, S., and Thompson, S. Eds., Berkshire Encyclopedia of Sustainability, 1st ed. Berkshire, Great Barrington, MA.

Publications with high school students

Nam J, Katsiaficas N, Wang X, Morgan D, **Ayers JC** (2015) Evaluation of Bigby Cannon Limestone’s Contributions to Pedogenesis Using Element Mass Flux Calculations. *Young Scientist* v. 5. <https://www.youngscientistjournal.org/article/evaluation-of-bigby-cannon-limestones-contributions-to-pedogenesis-using-element-mass-flux-calculations>

Lasley C, Katsiaficas N, **Ayers JC** (2014) Provenance of a soil atop a terrace along the Harpeth River in Tennessee using immobile trace element concentration ratios. *Young Scientist* v. 4, pp. 21-22, <https://www.youngscientistjournal.org/article/provenance-of-a-soil-atop-a-terrace-along-the-harpeth-river-in-tennessee-using-immobile-trace-element-concentration-ratios>

Tidwell, Brittainy S, **Ayers JC** (2011) Phytoremediation of Arsenic and Lead Using *Brassica rapa*. *Young Scientist*, v. 1, pp. 19-21.

<http://www.youngscientistjournal.org/2011/article/phytoremediation-arsenic-and-lead-using-brassica-rapa>.

Published Datasets and Code

Github repositories: <https://github.com/johncayers>

Ayers, JC (2022) Titanite solubility in silicate melt supporting data. figshare. Collection. <https://doi.org/10.6084/m9.figshare.c.5936143.v1>

Ayers, JC (2019) Compositions of Soil, Sediment, and Water in SW Bangladesh, Mendeley Data, v1 <http://dx.doi.org/10.17632/6z6bdxrkkb.1>

Ayers JC, Wang X, Katsiaficas N, Nam JH, Lasley C, Liu, X (2017) U-Pb Zircon Geochronology for Determining Soil Provenance in a Limestone Terrane, Middle Tennessee, United States. EarthChem Library. <http://dx.doi.org/10.1594/IEDA/100733>

Ayers JC, Goodbred SL, George G, Fry D, Benneyworth L, Hornberger G, Roy K, Karim MR, Akter F (2017) Compositions of groundwater samples from shallow aquifer in southwest Bangladesh Dataset #874440.

<https://doi.pangaea.de/10.1594/PANGAEA.874440>

Ayers, JC; George, G; Fry, D; Benneyworth, L; Wilson, C; Wallace Auerbach, L; Roy, K; Karim, MR; Akter, F; Goodbred, S (2017) Surface water chemistry and tidal channel time series in southwest Bangladesh. Dataset #875120.
<https://doi.pangaea.de/10.1594/PANGAEA.875120> .

Outreach: Wikis, Blogs, and Essays

Ayers JC (2020) My last drop. *Science* (80-) 370:374 LP – 374.

<https://doi.org/10.1126/science.370.6514.374>

Ayers JC (2020) Gassy precursors for geyser eruptions?

https://volcanoes.usgs.gov/volcanoes/yellowstone/article_home.html?vaid=255

Ayers Research Group Wiki: doi 10.17605/OSF.IO/F89KW

https://osf.io/f89kw/?view_only=839808ef03a54cff834be3647818f521

Ayers JC (2009-2013) Sustainability blog: <https://sustainability-ayersj.blogspot.com/>

Ayers JC (2010) A message to science educators and students about global climate change

<https://blogs.agu.org/sciencecommunication/2010/04/19/message-to-science-educators/>

Conference Papers

Peer-Reviewed

Bitting K, **Ayers JC**, Savage K (2005) Fact or fiction: The truth about water contamination in Manchester and Tullahoma, TN. In Proceedings of the Fifteenth Tennessee Water Resources Symposium, pp. 3C-20 to 3C-23, American Water Resources Association.

Ayers, JC, Loflin, M, Miller, CF, Barton, MD, and Coath, C (2004) Dating fluid infiltration using monazite. In R.B. Wanty, and R.R. Seal II, Eds. *Proceedings of the Eleventh International Symposium on Water-Rock Interaction, Vol. 1*, p. 247-251. A.A. Balkema Publishers.

Ayers JC (2000) Source Processes: Slab dehydration, fluid-wedge interaction, and partial melting to form primitive arc lavas. In State of the Arc 2000: Processes and Timescales, extended abstracts, eds. I.E.M. Smith, J.P. Davidson, J.A. Gamble and R.C. Price, pp. 13-16.

Ayers JC, DeLaCruz KJ (1997) Hydrothermal growth kinetics of zircon (ZrSiO₄). *Proceedings of the Fifth International Symposium on Hydrothermal Reactions*, pp. 227-231.

Rubin PA, **Ayers JC**, Grady KA (1992) Solution mining and resultant evaporite karst development in Tully Valley, New York, pp. 313-328, *Proc. Third Conference on Hydrogeology, Ecology, Monitoring, and Management of Ground Water in Karst Terranes*, Water Well Journal Pub. Co., 793 pp.

Abstracts (Recent only)

Jing W, Chen M, **Ayers JC** (2022) Stream Metabolism Characterized Using Dissolved Oxygen Measurements in Two Middle TN Streams. Fall AGU meeting.

Ayers JC, Jing W, Chen M, Daugherty E, Perez G, Gomez-Velez JD (2022) Effects of Nutrient Pollution and Urbanization on Diel Cycles and CO₂ Emissions in Two Middle TN Streams. Fall AGU meeting.

- Zanibi H, Ayers JC (2021) Are nutrients affected by diel cycles in streams? Study of a low-discharge stream in middle TN. Geological Society of America Abstracts with Programs. Vol 53, No. 6, 2021. <https://doi.org/10.1130/abs/2021AM-367326>.
- Zanibi H, Ayers JC (2021) Diurnal changes in stream water quality parameters, East Fork Creek, Franklin, TN. Oral presentation, TN Water Resources Symposium. <https://tnawra.org/library>
- Ayers JC, Patton BL, Dietrich M (2021) Rice paddy soil water salinization, acidification, and arsenic concentration. International Conference on Water and Flood Management, Bangladesh (ICWFM-8 abstracts at <https://iwfm.buet.ac.bd/site/iwfm/icwfm2021>)
- Dietrich M, Ayers JC (2021) Estuarine trace metal(loid) cycling and possible environmental health risks. International Conference on Water and Flood Management, Bangladesh. (ICWFM-8 abstracts at <https://iwfm.buet.ac.bd/site/iwfm/icwfm2021>)
- Dietrich M, Ayers JC (2020) Element Transport and Partitioning Along Tidal Channels in Southwest Bangladesh. Invited Presentation, GSA Annual Meeting. <https://gsa.confex.com/gsa/2020AM/meetingapp.cgi/Paper/352040>
- Ayers JC, Peters C (2020) Conversion of Tidal Channel Water to Shallow As-Rich Groundwater Through Reduction of Ferric Oxides in the Tidal Deltaplain of SW Bangladesh. Goldschmidt Conference of the Geochemical Society. <https://doi.org/10.46427/gold2020.96>
- Ajayi M, Ayers JC, Rahilly K (2019) Investigations into Diffuse CH₄ and CO₂ Measurements in N. American Calderas. Fall AGU meeting. V31H-0092
- Ayers JC, Ajayi M, Rahilly K (2019) Carbon Dioxide Emissions Near Geysers, Fumaroles, Mudpots, Travertine Terraces, and Hot Springs in Yellowstone National Park. Fall AGU meeting, V33D-0212
- Dietrich M, Ayers JC (2019) Possible Factors Affecting Trace Element Concentrations in Southwest Bangladesh Surface Waters: The Role of Seasonality, Evaporation, and Irrigation Source. Fall AGU meeting. H33D-05

GRANTS

External

- National Science Foundation**, PI, \$954,808, pending, EAR-Climate: Effects of nutrient pollution, temperature, discharge, and urbanization on CO₂ and CH₄ emissions from streams in Middle TN.
- National Science Foundation**, PI, Proposal # 2221906, \$412,943, 2022-2025, Collaborative Research: Probing zircon reactivity in aqueous solutions at solubility equilibrium using isotope tracers.
- National Science Foundation**, co-PI (Steve Goodbred PI), OCE-1600319, \$810,211, 2016-2020, Coastal SEES Collaborative Research: Multi-scale modeling and observations of landscape dynamics, mass balance, and network connectivity for a sustainable Ganges-Brahmaputra delta.
- Department of Defense**, Multidisciplinary University Research Initiative, Office of Naval Research, co-PI (Steve Goodbred PI), Total: \$7,496,577, Vanderbilt \$5,722,451, 2011-2017, Environmental stress and human migration in a low-lying developing nation: A comparison of co-evolving natural and human landscapes in the physically and culturally diverse context of Bangladesh.

- National Science Foundation**, co-PI (Calvin Miller PI), EAR-0911726, \$347,475, 6/09-6/13, Supereruptions, Magma Chambers, & Plutonic Residue: Insights from Peach Spring Tuff, Significance of Sphene.
- National Science Foundation**, PI, EAR-0838391, \$261,031, 6/09-6/12, Trace element partitioning between zircon, aqueous fluids and silicate melt at high and ultrahigh pressures.
- National Science Foundation**, PI (Calvin Miller co-PI), EAR-0510092, \$285,000, 6/1/05-6/1/09, Zr mineral aqueous solubilities and zircon/(fluid-melt) partitioning.
- National Science Foundation**, PI (Calvin Miller co-PI), EAR-0126020, \$195,459, 1/02-1/06, Monazite as a sensitive indicator of the timing and type of fluid activity during metamorphism.
- National Science Foundation**, PI (Calvin Miller co-PI), EAR-9873626, \$170,929, 1/99-1/02, Laboratory and field investigations of monazite petrogenesis, growth kinetics, textural development, and U-Th-Pb chronometry in igneous and high-grade metamorphic rocks.
- National Science Foundation**, co-PI (Calvin Miller PI), EAR-9506551, \$145,551, 7/95-7/99, Evaluating the potential of zircon and monazite in thermochronometry of high temperature crustal processes.
- National Science Foundation**, EAR-931705, \$88,000, 4/94-10/96, Experimental investigation of the stability and aqueous solubility of Ti- and Zr-rich minerals: Implications for HFSE mobilities in subduction zones.

Internal – most recent

- Discovery Grant**, “Purchase of a Picarro G2201-I Cavity Ring-Down Spectroscopy Analyzer and Concentrations and Carbon Isotope Compositions of CO₂ and CH₄ Gases” 6/2015-6/2017, \$145,714.
- TIPS**, "Sterling Ranch – A Unique Vanderbilt Sustainability and Education Research Center," co-PI (David Kosson PI), 09/2015-08/2018, \$1,044,261.
- Discovery Grant**, “Cathodoluminescence (CL) detector and spectrometer for Earth, environmental, and materials research,” co-PI (Guil Gualda PI), 06/2011-05/2013, \$171,399.

PROFESSIONAL AFFILIATIONS AND SERVICE

Professional Societies

| | |
|--|--------------|
| American Academy of Environmental Engineers and Scientists | 2016-2020 |
| • Students and Young Professionals Committee | 2018-2020 |
| American Association for the Advancement of Science (AAAS) | 2017-present |
| American Geophysical Union | 1990-present |
| • Union Medals Committee | 2004-2006 |
| Geochemical Society | 1990-present |
| Geological Society of America | 1990-present |
| • Early Career Award committee for the MGPV Division | 2015-2016 |
| • On to the Future mentor | 2021 |
| Mineralogical Society of America | 1984-present |
| • Roebling Medal Committee | 2021-2024 |

- Award Committee 2015-2019
 - Lecture Program Committee 2002-2006
- Union of Concerned Scientists 2005-present

Symposium Co-Organizer

- Geological Society of America annual meeting, “Advances in Mineralogy and Petrology” session 2012
- Geochemical Society Goldschmidt Conference, co-convened two sessions 2010
- International Geological Congress, "Trace element mineralogy" session 2000

Editorial

- Geochemical Transactions of the American Chemical Society, Associate Editor 2006-2019
- American Mineralogist, Associate Editor 2001-2006

External Referee for Promotion and Tenure Cases

- Nigel Kelly, Colorado School of Mines, Asst. Prof. 2013
- Andrew Quicksall, Southern Methodist Univ., Asst. Prof. 2014
- Saeb Al-Shereideh, Yarmouk Univ., Assoc. Prof. 2016
- Ashaki Rouff, Rutgers Univ., Assoc. Prof. 2022

Select Invited talks

- Roanoke College 2021
- Department of Geology, The University of Memphis 2016
- Univ. of Georgia Dept. of Geology 2013
- Sustainable Tennessee Summit 2012
- Northwest University, Xi’an, China 2011
- Chinese Academy of Geological Sciences, Beijing, China 2007
- China University of Geosciences, Wuhan, China 2007
- Keynote speaker, Goldschmidt Conference 2006
- Australian National University 2006
- Invited speaker, Goldschmidt Conference 2006
- Chemical Science Division, Oak Ridge National Laboratory 2002
- Univ. of South Carolina 2002
- Keynote speaker, Invited speaker, Goldschmidt Conference 2001
- Keynote speaker, International Association of Volcanology and Chemistry of the Earth's Interior (IAVCEI) workshop on Magmatic Arcs, New Zealand 2000

Other

- National Science Foundation Review Panel 2012, 2016
- Sigma Xi Admissions Committee Chair, VU 2001

COMMUNITY SERVICE

- Center for Sustainable Stewardship**, Board of Directors, Franklin, TN 2019-present
- Go Green North Nashville**, Advisory Council 2012-2014

LANGUAGES

English: Native Language

German: Intermediate Listener, Novice Speaker

COMPUTER SKILLS

Programming: R/RStudio (proficient), Python and Matlab (novice)

Software: ArcGIS, Geochemists Workbench, Phreeqi

OTHER

Married, two children. Enjoy reading, music, travel, hiking, backpacking, camping, and woodworking.