Charles A. Cravotta III

Hydrologist/Geochemist
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Cravotta Geochemical Consulting, LLC
859 Bloody Spring Road
Bethel, Pennsylvania

Education

1996 Ph.D. Geochemistry and Mineralogy, Pennsylvania State University
1986 M.S. Geochemistry and Mineralogy, Pennsylvania State University
1979 B.A. Environmental Sciences, University of Virginia

Professional Experience

More than 40 years of experience evaluating geochemical and hydrological processes that control water quality, particularly the sources, transport, and attenuation of metals and nutrients in undisturbed and mining-impacted watersheds and aquifers. Extensive interactions with students as external research advisor.

2024-Present: Hydrologist/Geochemist, Cravotta Geochemical Consulting, LLC.
1987-2023: Research Hydrologist, U.S. Geological Survey, Pennsylvania Water Science Center.
1986-1987: Geochemist, IT Corporation, Monroeville, PA.
1979-1983: Geologist/Map editor, U.S. Geological Survey (USGS), Technical Reports Unit, Reston, VA.
1979: Geologic Technician, Virginia Water Control Board, Alexandria, VA.

Professional Certification and Affiliations

2018-present: Adjunct Instructor, Earth and Environmental Sciences, University of Pittsburgh
2011-2016: Associate Editor, Mine Water and Environment, International Mine Water Association
2001-2017: Environmental and Civil Engineering Advisory Board, Penn State University, Harrisburg
2001-2005: Adjunct Assistant Professor of Environmental Engineering, Penn State University, Harrisburg
1995-present: Registered Professional Geologist in Pennsylvania PG-002255-G

Awards and Recognition

International Association of GeoChemistry (IAGC) "Excellence in Review" Award, 2023
The Society for Organic Petrology Dalaway J. Swain Award "Best Refereed Paper", 2016
Department of Interior Partners in Conservation Award (AMDTreat Development Team), 2013
Top 50 Most-Cited Papers in "Applied Geochemistry" (2006-2011)
Department of Interior Superior Service Award, 2005
Schuylkill County Conservation Professional of the Year Award, 2003
Pennsylvania Department of Environmental Protection Award for Excellence, 1999

Selected Publications (orcid 0000-0003-3116-4684) with student coauthors; students identified by *

1. Vesper, D.J., Cravotta, C.A. III, Lei, L.,* Wallace, M.,* Schaffer, C.R.* (2025) Determination of CO_2 and DIC in high-CO_2 waters: An application for the analysis of coal mine waters. Applied Geochemistry 183, 106336.
2. McDevitt, B.,* Cravotta, C.A. III, McAleer, R.J., Jackson, J.C., Jubb, A.M., Jolly, G.D., Hedin, B.C., Warner, N.R. (2024) Evaluation of coal mine drainage and associated precipitates for radium and rare earth element concentrations: International Journal of Coal Geology 28, 104547.
3. Hedin, B.C.,* Stuckman, M.Y., Cravotta, C.A. III, Lopano, C.L., Capo, R.C. (2024) Determination and prediction of micro scale rare earth element geochemical associations in mine drainage treatment wastes: Chemosphere 346, 140475.
4. Schaffer, C.R.,* Cravotta, C.A. III, Capo, R.C., Hedin, B.C.,* Vesper, D.J., Stewart, B.W. (2024) Multi-decadal geochemical evolution of drainage from underground coal mines in the Appalachian basin, USA: Science of the Total Environment 947, 174681.
5. Marks, N.J.,* Cravotta, C.A. III, Rossi, M.L.,* Silva, C.,* Kremer, P., Goldsmith, S. (2024) Exploring spatial and temporal symptoms of the freshwater salinization syndrome in a rural to urban watershed: Science of the Total Environment 947, 174266.
6. Spellman, C.J. Jr.,* Smyntek, P.M., Cravotta, C.A. III, Tasker, T.L., Strosnider, W.H.J. (2022) Pollutant co-attenuation via in-stream interactions between mine drainage and municipal wastewater: Water Research 214, 118173.
7. Smyntek, P., Lamagna, N,* Cravotta, C.A. III, Strosnider, W.H.J. (2022) Mine drainage precipitates attenuate and conceal wastewater-derived phosphate pollution in stream water: Science of the Total Environment 815, 152672.
8. Cravotta, C.A. III (2021) Interactive PHREEQ-N-AMDTreat water-quality modeling tools to evaluate performance and design of treatment systems for acid mine drainage: Applied Geochemistry 126, 10845.

9. Castillo-Meza, L.E.,* Cravotta, C.A. III, Tasker, T.L.,* Warner, N.R., Daniels, W.L., Orndorff, Z.W., Bergstresser, T., Douglass, A., Kimble, G., Streczywilk, J., Barton, C., Fulton, S., Thompson A., Burgos, W.D. (2020) Batch extraction method to estimate total dissolved solids (TDS) release from coal refuse and overburden: Applied Geochemistry 115, 104540.
10. Burté, L.,* Cravotta, C.A. III, Bethencourt, L.,* Farasin, J., Pédrot, M., Dufrense, A.,* Gérard, M.-F., Baranger, C.C., Le Borgne, T., Aquilina, L. (2019) Kinetic study on clogging of a geothermal pumping well triggered by mixing-induced biogeochemical reactions: Environmental Science & Technology 53, 5848-5857.
11. McDevitt, B.,* McLaughlin, M.,* Cravotta, C.A. III, Ajemigbitsea, M.A.,* Van Sice, K.J.,* Blotevogel, J., Borch, T., Warner, N.R. (2019) Emerging investigator series: radium accumulation in carbonate river sediments at oil and gas produced water discharges: implications for beneficial use as disposal management: Environmental Science: Processes & Impacts 21, 324-338.
12. Van Sice, K.,* Cravotta, C.A. III, McDevitt, B.,* Tasker, T.,* Landis, J.,* Puhr, J.,* and Warner, N. (2018) Radium attenuation and mobilization in stream sediments following oil and gas wastewater disposal in western Pennsylvania: Applied Geochemistry 98, 393-403.
13. Burrows, J.E.,* Cravotta, C.A. III, Peters, S.C. (2017) Enhanced Al and Zn removal from coal-mine drainage during rapid oxidation and precipitation of Fe oxides at near-neutral pH: Applied Geochemistry 78, 194-210.
14. Zhou, J.,* Wang, H., Cravotta, C.A. III, Dong, Q., Xiang, X. (2017) Dissolution of fluorapatite by *Pseudomonas fluorescens* P35 resulting in fluorine release: Geomicrobiology Journal 34, 421-433.
15. Burrows, J.E.,* Peters, S.C., Cravotta C.A. III (2015) Temporal geochemical variations in above- and below-drainage coal mine discharge: Applied Geochemistry 62, 84-95.
16. Cravotta, C.A. III, Brady, K.B.C. (2015) Priority pollutants and associated constituents in untreated and treated discharges from coal mines in Pennsylvania, U.S.A.: Applied Geochemistry 62, 108-130.
17. Cravotta, C.A. III, Goode, D.J., Bartles, M.D.,* Risser, D.W., Galeone, D.G. (2014) Surface-water and groundwater interactions in an extensively mined watershed, Upper Schuylkill River, Pennsylvania, USA: Hydrological Processes 28, 3574–3601.
18. Geroni, J.N.,* Cravotta, C.A. III, Sapsford, D.J. (2012) Evolution of the chemistry of Fe bearing waters during CO_2 degassing: Applied Geochemistry 27, 2335-2347.

Graduate Student Research Committees and Guidance

- Penn State University: Weixing Guo, Ph.D. 1993 (R.R. Parizek, advisor); Derek R. Evans, M.S. 1994 (A.W. Rose, advisor); Kevin Wilson, M.S. 1995 (R.R. Parizek, advisor); Caroline Loop, Ph.D. 2003 (W.B. White, advisor); Lisa Forney, M.E.P.C. 2003 (Samuel McClintock, advisor); Paul DeAngelo, M.S. 2005 (Yeufeng Xie, advisor); Katherine Van Sice, M.S. 2018 (Nathaniel Warner, advisor), Luis Castillo Meza, Ph.D. 2018 (William Burgos, advisor), Bonnie McDevitt, Ph.D. 2020 (Nathaniel Warner, advisor).
- University of Pittsburgh: Benjamin Hedin, Ph.D. 2021 (Rosemary Capo, advisor), Camille Schaffer, Ph.D., 2025 (Brian Stewart, advisor), Tashane Booth, Ph.D., *in progress* (Brian Stewart, advisor).
- Ohio State University: David J. Williams, M.S. 1999 (J.M. Bigham, advisor), Wendy Gagliano, M.S. 2001 (J.M. Bigham, advisor).
- West Virginia University: Matthew Daly, M.S. 1998 (Joseph Donovan, advisor); Eliza Siefert, M.S. *in progress* (Dorothy Vesper, advisor).
- Lehigh University: Jill Burrows Henry, Ph.D. 2015 (Stephen Peters, advisor).
- Shippensburg University: Dana Heston, M.S. 2015 (Thomas Feeney, advisor).
- Villanova University: Nicole Marks, M.S. 2020 (Steven Goldsmith, advisor), Marissa Rossi, M.S. 2022 (Steven Goldsmith, advisor), Livia Graham M.S. *in progress* (Steven Goldsmith, advisor).
- Towson University: Mary Rogers, M.S. 2020 (Amy Williams, advisor).
- China University of Geosciences: Deng Liu, Ph.D. 2013 (Hongmei Wang, advisor), Linfeng Gong, Ph.D. 2013 (Hongmei Wang, advisor), Jianping Zhou, Ph.D. 2017 (Hongmei Wang, advisor).
- University of New South Wales, Australia: Rosalind Desmier Greene, Ph.D. 2004 (David Waite, advisor).
- La Trobe University, Victoria, Australia: Sylvana Santomartino, Ph.D. 2005 (John Webb, advisor), Danny McDonald, Ph.D. 2006 (John Webb, advisor), Farah Ali, Ph.D. 2024 (John Webb, advisor).
- Cardiff University, UK: Jennifer Geroni, Ph.D. 2012 (Devin Sapsford, advisor).
- Luleå University of Technology, Sweden: Peter Nason, Ph.D. 2013 (Lena Alakangas, advisor), Lucile Villain, Ph.D. 2014 (Lena Alakangas, advisor).
- University of Ottawa, Canada: Elizabeth Ashby, M.S. 2017 (Danielle Fortin, advisor).
- Université de Rennes 1, France: Luc Burté, Ph.D. 2018 (Julien Farasin, advisor).
- University of Minho, Portugal: Ana Barroso, Ph.D. *in progress* (Teresa Valente, advisor).
- University of Evora, Portugal: Joana Araújo, Ph.D. *in progress* (Rita Ferreira da Fonseca, advisor).
- University of São Paulo, Brazil: Lucas Vieira, Ph.D. *in progress* (Reginaldo Antonio Bertolo, advisor).