

Grace Schwartz

Smithsonian Environmental Research Center

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Current Position

June 2015-present Postdoctoral Fellow
Smithsonian Environmental Research Center
Microbial Ecology Laboratory (PI: Cynthia Gilmour)

Academic Qualifications

2015 Ph.D., Civil and Environmental Engineering
Duke University, Durham, NC

Dissertation: Biogeochemical Transformations of Trace Element Pollutants During Coal Combustion Product Disposal

Advisor: Heileen Hsu-Kim

Committee Members: Avner Vengosh, Claudia Gunsch, James Hower

2008 B.S., Chemistry
Virginia Commonwealth University, Richmond, VA

2008 B.A., Philosophy
Virginia Commonwealth University, Richmond, VA

Professional Experience

2008-2010 Assistant Scientist I (Analytical Chemistry)
AAIPharma Services, Durham, NC

Summer
2007 Environmental Chemistry Laboratory Intern
Dominion, Chester, VA

Summer
2006 Quality Assurance Laboratory Intern
Honeywell, Hopewell, VA

Fellowships and Awards

- 2012-2015 Doctoral Scholarship (\$12,000/yr)
 Environmental Research and Education Foundation
- 2010-2011 Pratt-Gardner Fellowship
 Pratt School of Engineering, Duke University
- 2007 Mary E. Kapp Service Award
 Department of Chemistry, Virginia Commonwealth University
- 2004-2008 Provost Scholarship
 Virginia Commonwealth University

Teaching

- Instructor Energy and the Environment: Exploring paths toward a cleaner
 future
 Osher Life Long Learning Institute, Duke University
 Spring 2014
- Teaching Environmental Aquatic Chemistry (graduate level)
Assistant Duke University
 Fall 2011, Fall 2012
- Teaching Chemical Processes in Environmental Engineering (undergraduate)
Assistant Duke University
 Fall 2011, Fall 2012
- Teaching Organic Chemistry Laboratory 1 and 2 (undergraduate)
Assistant Virginia Commonwealth University
 Spring 2007, Fall 2007, Spring 2008
- Student Guided Inquiry General Chemistry Course
Facilitator Virginia Commonwealth University
 Spring 2006

Mentoring

- Allison Wong (SERC REU, Summer 2016)
Marisa Sobel (SERC Intern, Spring 2016)
Christopher Schular (SERC REU, Summer 2015)

Zakary Goldberg (Duke REU, Summer 2013)
Andrew Matsumoto (Duke REU, Summer 2012)

Peer-Reviewed Publications

Schwartz, G.E., Redfern, L., Ikuma, K., Gunsch, C., Ruhl, L.S., Vengosh, A., Hsu-Kim, H. Impacts of Coal Ash on Methyl Mercury Production and the Methylating Microbial Community in Anaerobic Sediment Slurries. *Environmental Science: Processes and Impacts*. 2016. In Press. DOI: 0.1039/c6em00458j.

Schwartz, G.E.; Rivera, N.A.; Lee, S.-W.; Harrington, J.M.; Hower, J.C.; Levine, K.E.; Vengosh, A.; Hsu-Kim, H. (2016). Leaching potential and redox transformations of arsenic and selenium in sediment microcosms with fly ash. *Applied Geochemistry*. 67, 177-185. DOI: 10.1016/j.apgeochem.2016.02.013.

Ruhl L., Vengosh A., Dwyer G., Hsu-Kim H., **Schwartz G.**, Romanski, A., Smith S.D. (2012). The impact of coal combustion residue effluent on water resources: A North Carolina example. *Environmental Science & Technology*, 46(21), 12226-12233. DOI: 10.1021/es303263x.

Manuscripts in Preparation

Schwartz, G.E., Sanders, J., McBurney, A., Ghosh, U., Gilmour, C. Impacts of Dissolved Organic Carbon on Mercury and Methyl Mercury Partitioning in Anaerobic Activated Carbon-Sediment Mixtures.

Schwartz, G.E., Hower, J.C., Phillips, A., Vengosh, A., Hsu-Kim, H. Predicting the Environmental Leaching Potential of Arsenic and Selenium in Coal Ash Materials: A Comparison of Methods.

Other Publications

Schwartz, G. "Coal Ash Can Be Re-Used, But Its Management Practices are Beset with Complications." *Waste360 Magazine*. May 28, 2014.

Invited Presentations

North Carolina State University, Department of Soil Science.
"Investigating the Environmental Impacts of Coal Combustion: Biogeochemical Transformations of Mercury, Arsenic, and Selenium during Coal Ash Waste Disposal." October 9, 2013.

Brooks Rand Instrument Short Course: Trace-level mercury measurement workshop and MERX user group meeting.

“An Arranged Marriage: Coupling the Merx-M with ICP-MS.” July 28, 2013.

Conference Platform Presentations

Santillan, E.F.U., Gilmour, C., **Schwartz, G.**, Christensen, G. A., King, A., Elias, D.A. The Distribution and Abundance of Mercury Methylating Microorganisms in Mid-Atlantic Wetlands. American Geophysical Union Meeting. San Francisco, CA. December 14-17, 2015.

Schwartz, G., Hsu-Kim, H. Transformations of mercury, arsenic and selenium in river sediments contaminated with coal ash: Sediment microcosm studies. World of Coal Ash Conference. Lexington, KY. April 23-25, 2013.

Schwartz, G., Hsu-Kim, H. Transformations of mercury, arsenic and selenium in river sediments contaminated with coal ash: Sediment microcosm studies. Geological Society of America Meeting. Charlotte, NC. November 4-7, 2012.

Schwartz, G., Deonaraine A., Ruhl, L., Bartov, G., Johnson, T., Vengosh, A., Hsu-Kim, H. Transformations of mercury, arsenic and selenium in river sediments contaminated with coal ash: Field and laboratory studies. 22nd Annual V.M. Goldschmidt Conference. Montreal, Canada. June 24-29, 2012.

Conference Poster Presentations (*Denotes Undergraduate Mentee)

Schwartz, G., Brown, S., Gilmour, C. Geochemical Controls on Activated Carbon Effectiveness in Remediating Mercury and Methylmercury-Contaminated Soils. Ninth International Conference on Remediation and Management of Contaminated Sediments. New Orleans, LA. January 9-12, 2017.

Schwartz, G., McBurney, A., Bell, J.T., Gilmour, C.G., DOC Impacts on Mercury and Methyl Mercury Partitioning in Activated Carbon-Sediment Mixtures. Gordon Research Conference. Plymouth, NH. June 26-July 1, 2016.

Schwartz, G., Redfern, L., Gunsch, C., Vengosh, A., Hsu-Kim, H., Stimulation of Mercury Methylation by Coal Ash in Anaerobic Sediment Microcosms. American Geophysical Union Meeting. San Francisco, CA. December 13-17, 2015.

Schwartz, G., Hsu-Kim, H. Investigating the Environmental Impacts of Coal Ash Disposal: Biogeochemical Transformations of Mercury, Arsenic, and Selenium. Gordon Research Conference. Plymouth, NH. June 22-27, 2014.

Matsumoto, A., * **Schwartz, G.**, Deonarine, A., Hsu-Kim, H. Application of sequential extractions for assessing mercury speciation in coal ash. International Conference on Mercury as a Global Pollutant. Edinburgh, Scotland, UK. July 28-August 2, 2013.

Schwartz, G., Hsu-Kim, H. Speciation and fate of mercury, arsenic, and selenium in river sediments contaminated with coal ash. International Conference on Mercury as a Global Pollutant. Edinburgh, Scotland, UK. July 28-August 2, 2013.

Matsumoto, A., * **Schwartz, G.**, Deonarine, A., Hsu-Kim, H. Assessment of mercury speciation in coal ash by sequential extractions. Geological Society of America Meeting. Minneapolis, MN. October 8-12, 2011.

Schwartz, G., Deonarine, A., Matsumoto, A., Ruhl, L., Bartov, G., Johnson, T., Vengosh, A., Hsu-Kim, H. Mobilization and methylation of mercury derived from coal ash holding pond effluents. Geological Society of America Meeting. Minneapolis, MN. October 8-12, 2011.

Professional Memberships

American Chemical Society, Geochemical Society, Geological Society of America, American Geophysical Union

Professional Development

Solid Waste Management Life-Cycle Assessment Workshop,
Environmental Research and Education Foundation, Raleigh, NC, October 3, 2014.

Laboratory X-ray Techniques for the Characterization of Nanomaterials in Complex Matrices Workshop, CEREGE, Aix-en-Provence, France, July 2, 2013.

Professional Service and Outreach

Conference Session Moderator. World of Coal Ash Conference. Lexington, KY. April 23-25, 2013.

FEMMES (Females Excelling More in Math Engineering and Science) Workshop Volunteer, 2011-2014.

NCACS (North Carolina section of the American Chemical Society) National Chemistry Week Volunteer, October 12, 2013.