

CURRICULUM VITAE
Daniel Joseph Brabander

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PROFESSIONAL PREPARATION

Binghamton University	Geological Sciences	B.S. with honors	1987
Binghamton University	Geological Sciences	M.A.	1990
Brown University	Geological Sciences	Ph.D.	1997
Massachusetts Institute of Technology	Biogeochemistry	Postdoctoral	1997–2001

APPOINTMENTS

2003–
Present **Wellesley College, Wellesley MA**
Department of Geosciences
Chair 2010–Present, Associate Professor 2007–Present, Assistant Professor 2003–2007
Research topics: Biogeochemistry, fate and transport of pollutants in watersheds, urban environmental health and medical geology, and undergraduate science education models

2006–
Present **Harvard School of Public Health, Boston, MA**
Department of Environmental Health
Visiting Scientist

2001–2003 **University of Massachusetts–Boston, Boston MA**
Department of Environmental, Coastal, and Ocean Sciences
Assistant Professor and Director of the Undergraduate Program in Environmental Studies

Fall 1996–
Summer 2001 **Massachusetts Institute of Technology, Cambridge MA**
Department of Civil and Environmental Engineering, Parsons Laboratory
Postdoctoral Associate
Research topics: fate and transport of heavy metals in watersheds

Fall 2000 **Massachusetts Institute of Technology, Cambridge MA**
Department of Civil and Environmental Engineering, Parsons Laboratory
Lecturer, Aquatic Chemistry

Spring 1996
Spring 1999 **Boston University, Boston MA**
Department of Geological Sciences
Lecturer, Introduction to Geochemistry; Igneous and Metamorphic Petrology

1990–1996 **Brown University, Providence RI**
Department of Geological Sciences
Research Assistant
Research topics: Diffusion kinetics of Sr isotopic exchange in amphiboles and application of results to a novel approach for modeling thermal histories of tectonic terrains

Spring &
Summer 1990 **Salem State College, Salem MA**
Department of Geological Sciences
Visiting Lecturer, Physical Geology

1987–1989 **Binghamton University, Binghamton NY**
Department of Geological Sciences and Environmental Studies
Research Assistant
Research topics: Experimental geochemistry, phase equilibria, and determination of F-OH diffusion kinetics

RESEARCH GOALS

My research emphasizes transdisciplinary projects that foster collaboration among biologists, chemists, public health scientists, and environmental engineers and involves research experiences for undergraduates and not-for-profit partners. Current research focus is environmental geochemistry, health, and the quantification of toxic metal exposure pathways in the built environment. Applications include fate and transport studies of contaminants in watersheds and urban settings, isotopic dating and mapping of contaminants within sediments and soils, environmental mineralogy with advanced spectroscopic methods, and sustainable urban agriculture.

PUBLICATIONS (* = undergraduate author) Total number citations (3/22/11) = 746, h-index=10

23. Lin C. G., Schaider L. A., **Brabander** D. J., Woolf A. D. (2010) Pediatric lead exposure from imported Indian spices and religious ceremonial powders. *Pediatrics* 125: (4) e828-e835. DOI: 10.1542/peds2009-1396.
22. Blute N. K., Jay J. A., Swartz C. H., **Brabander** D. J., Hemond H. F. (2009) Aqueous and solid phase arsenic speciation in the sediments of a contaminated wetland and riverbed. *Applied Geochemistry* 24: 346-358.
21. Heiger-Bernays W., Burns V., Diskin K., Pierotti D., Mercant-Borna K., McClean M., **Brabander** D., Hynes H. P. (2009) Characterization and low-cost solutions for soils contaminated by timbers in community gardens. *International Journal of Soil, Sediment and Water* 2: (3) Art. 5.
20. Smith J. P., Bullen T., **Brabander** D. J., Olsen C. R. (2009) Strontium isotope record of seasonal scale variations in sediment sources and accumulation in low-energy, subtidal areas of the lower Hudson River estuary. *Chemical Geology* 264: 375-384.
19. Stewart T. J. *, Yau J. H. *, Allen M. M., **Brabander** D. J., Flynn N. T. (2009) Impacts of calcium-alginate density on equilibrium and kinetics of lead(II) sorption onto hydrogel beads. *Colloid and Polymer Science* 287:1033-1040. DOI 10.1007/s00396-009-2058-4.
18. Clark H. F. *, Hausladen D. M. *, **Brabander** D. J. (2008) Urban gardens: Lead exposure, recontamination mechanisms, and implications for remediation design. *Environmental Research* 107: (3) 312-319.
17. Burnet A. *, Kurtz A. C., **Brabander** D. J., Shailer M. (2007) Dendrochemical record of historical lead contamination sources, Wells G&H Superfund site, Woburn, Massachusetts *Journal of Environmental Quality* 36:1488-1494.
16. Schaider L. A., Senn D. B., **Brabander** D. J., McCarthy K. D. *, Shine J. P. (2007) Characterization of zinc, lead and cadmium in mine waste: Implications for transport, exposure, and bioavailability. *Environ. Sci. Technol.* 41: 4164-4171.
15. Clark H. *, **Brabander** D., Erdil R. * (2006) Sources, sinks and exposure pathways of lead in urban garden soil. *Journal of Environmental Quality* 35: (6) 2075-2083.
14. Rauch S., Hemond H., **Brabander** D. (2006) High spatial resolution analysis of lake sediment cores by laser ablation-inductively coupled plasma-mass spectrometry (LA-ICP-MS). *Journal of Limnology and Oceanography: Methods* 4: 268-274.
13. Harvey C. F., Swartz C. H., Badruzzaman A. B. M., Keon-Blute N., Yu W., Ashraf Ali M., Jay J., Beckie R., Niedan V., **Brabander** D. J., Oates P. M., Ashfaq K. N., Islam S., Hemond H. F., Ahmed M. F. (2005) Groundwater arsenic contamination on the Ganges Delta: biogeochemistry, hydrology, human perturbations, and human suffering on a large scale. *C. R. Geoscience* 337: 285-296.
12. Blute N. K., **Brabander** D. J., Hemond H. F., Sutton S., Newville M. G., Rivers M. L. (2004) Arsenic sequestration by ferric iron plaque on cattail roots. *Environ. Sci. Technol.* 38: 6074-6077.
11. Swartz C. H., Keon-Blute N., Badruzzaman A. B. M., Ashraf Ali M., **Brabander** D. J., Jay J., Besancon J., Islam S., Hemond H. F., Harvey C. F. (2004) Mobility of arsenic in a Bangladesh aquifer: Inferences from geochemical profiles, leaching data, and mineralogical characterization. *Geochimica et Cosmochimica Acta* 68 (22): 4539-4557.
10. Oktay S. D., **Brabander** D. J., Smith J. P., Kada J., Bullen T., Olsen C. R. (2003) WTC geochemical fingerprint recorded in New York harbor sediments, *EOS Trans. AGU*, 84: (3) 21-28.
9. Harvey C. F., Swartz C. H., Badruzzaman A. B. M., Keon-Blute N., Yu W., Ashraf Ali M., Jay J., Beckie R., Niedan V., **Brabander** D. J., Oates P. M., Ashfaq K. N., Islam S., Hemond H. F., Ahmed M. F. (2003) Response to comments on "Arsenic mobility and groundwater extraction in Bangladesh." *Science* 300: 584d.
8. Rogers C. E., **Brabander** D. J., Barbour M. T., and Hemond H. F. (2002) Use of physical, chemical, and biological indices to assess impacts of contaminants and physical habitat alteration in urban streams. *Environmental Toxicology and Chemistry* 21 (6): 1156-1167.

7. Harvey C. F., Swartz C. H., Badruzzaman A. B. M., Keon-Blute N., Yu W., Ashraf Ali M., Jay J., Beckie R., Niedan V., **Brabander D. J.**, Oates P. M., Ashfaq K. N., Islam S., Hemond H. F., Ahmed M. F. (2002) Arsenic mobility and groundwater extraction in Bangladesh. *Science* 298: 1602–1606.
6. Edmands J. D. *, **Brabander D. J.**, Coleman D. S. (2001) Uptake and mobility of uranium in black oaks: Implications for biomonitoring depleted uranium-contaminated groundwater. *Chemosphere* 44: 789-795.
5. Keon N., Swartz C. H., **Brabander D. J.**, Harvey C., Hemond H. F. (2001) Validation of an arsenic sequential extraction method for evaluating mobility in sediments. *Environ. Sci. Technol.* 35: 2778–2784.
4. Farver J. R., **Brabander D. J.** (2001) Magma ascent rates from mineral reaction rims and extension to teaching about volcanic hazards. *Journal of Geoscience Education* 49 (2): 140-145.
3. **Brabander D. J.**, Keon N., Stanley R. H. R. *, Hemond H. F. (1999) Intra-ring variability of Cr, As, Cd, and Pb in red oak revealed by secondary ion mass spectrometry: Implications for environmental biomonitoring. *Proceedings of the National Academy of Sciences of the United States of America* 96: (25) 14635–14640.
2. **Brabander D. J.**, Giletti B. (1995) Strontium diffusion kinetics in amphiboles and significance to thermal history determinations. *Geochimica et Cosmochimica Acta.* 59 (11): 2223–2238.
1. **Brabander D. J.**, Hervig R. L., Jenkins D. M. (1995) Experimental determination of F-OH interdiffusion in tremolite and significance to fluorine-zoned amphiboles. *Geochimica et Cosmochimica Acta.* 59 (17): 3549–3560.

MANUSCRIPTS IN REVIEW

MANUSCRIPTS IN PREPARATION

- Schaider L. A., Estes E. R. *, Senn D. B., **Brabander D. J.**, Shine J. P. (2011) Characterizing sources and fate of metals in a mining-impacted watershed: Temporal shifts and sequestration mechanisms. *Applied Geochemistry*.
- Shafer T. D. *, Clark H.F., Estes E. R. *, Griffith A., **Brabander D. J.** (2011) A geochemical, geospatial, and geostatistical framework for trace element fate and transport in urban watersheds. To be submitted: *Environmental Pollution*.
- Brabander D. J.**, Stanley R. H. R. *, Hemond H. F. (2011) Isotopically mapping multiple Pb sources on an urban watershed using a rapid assessment method. To be submitted: *Environmental Pollution*.
- Brabander D. J.**, Ross L. *, Beattie R. B. (2011) Fingerprinting arsenic released from pressure treated wood in playground soils. To be submitted: *Environmental Monitoring*.

TECHNICAL REPORTS, CONFERENCE PROCEEDINGS, AND EDITORIALS

- 2007 Blute N. K., McGuire M. J., Qin G., **Brabander D. J.**, Newville M., Kavounas P. (2007) State-of-the-art geochemical techniques in evaluating drinking water treatment contaminant removal processes. *American Water Works Association Water Quality Technology Conference, Charlotte, North Carolina*.
- 2006 McGuire M. J., Blute N. K., Hamilton C., **Brabander D. J.** (2006) Formation of floating calcite rafts in a drinking water reservoir. *American Water Works Association Water Quality Technology Conference, Denver, Colorado*.
- 2003 Ross, L. *, Beattie, R. B., **Brabander D. J.** (2003) Protecting children in playgrounds. *Boston Globe* Editorial. November 6, 2003.
- 2002 Keon N., **Brabander D.**, Hemond H., Sutton S., Newville M. (2002) Cattail root plaque retention of arsenic. Appeared in APS Forefront (published by Argonne National Laboratory).
- 1998 Stanley R. H. R. *, Keon N., **Brabander D. J.**, Hemond H. (1998) A survey of heavy metal levels in soils associated with flooding of the Aberjona River, Winchester, MA. Report submitted to the Winchester Board of Health.

ABSTRACTS FOR CONFERENCE PROCEEDINGS (* = undergraduate author) (SINCE 1995)

- 2011 Fitzstevens M. G. *, Estes E., **Brabander D. J.** (2011) Lead in urban garden soil: soil characterization and bioavailability determination in Boston, Massachusetts. *Geological Society of America Abstracts with Programs*, Vol. 43, No. 1, p. 90.
- Gambill, I. *, Sedlack C. *, Willis-Norton E. *, Hatem A. *, **Brabander D. J.** (2011) Inventory analysis and transport of legacy metals in river and millpond sediments: An example from the Neponset River Watershed, Massachusetts. *Geological Society of America Abstracts with Programs*, Vol. 43, No. 1, p. 91.
- Meghani N. A. *, Estes E., **Brabander D. J.** (2011) Heavy metal associations with mineralogy and grain size at the Tar Creek Superfund Site, Picher, OK. *Geological Society of America Abstracts with Programs*, Vol. 43, No. 1, p. 70.
- 2010 Estes E. R. *, Flynn N. T., Schaider L., Shine J. **Brabander D. J.** (2010) Role of naturally precipitated hydrous ferric oxides in heavy metal fate and transport, Tar Creek Superfund Site, Oklahoma. *Abstracts of Papers, 239th ACS National Meeting*; American Chemical Society: San Francisco, 2010, GEOC-164.
- Estes E. *, Cater-Thomas M. *, **Brabander D. J.** (2010) Deposition of particulate matter as a mechanism for trace metals contamination of urban gardens. *Geological Society of America Abstracts with Programs*, Vol. 42, No. 5, p. 354.
- Shafer T. D. *, **Brabander D. J.**, Estes E. *, Griffith A. (2010) A geochemical, geospatial, and geostatistical framework for trace element fate and transport in urban watersheds. *Geological Society of America Abstracts with Programs*, Vol. 42, No. 5, p. 615.
- Tang F. *, **Brabander D. J.** (2010) Traditional Indian eye cosmetics as a potential source of bioaccessible lead exposure. *Geological Society of America Abstracts with Programs*, Vol. 42, No. 5, p. 88.
- 2009 Estes E. R. *, McCarthy K. M. *, **Brabander D. J.**, Schaider L., Shine J. (2009) Chemical and physical characterization of naturally precipitated hydrous ferric oxides at the Tar Creek Superfund Site, Oklahoma. *Geological Society of America Abstracts with Programs*, Vol. 41, No. 7, p. 329.
- Estes E. R. *, McCarthy K. M. *, **Brabander D. J.**, Schaider L., Shine J. (2009) Hydrous ferric oxide transport processes during flood events: Examples from the Tar Creek Superfund Site. *Geological Society of America Abstracts with Programs*, Vol. 41, No. 3, p. 92.
- Carter-Thomas M. R., * **Brabander D. J.** (2009) Trace metal concentrations in urban parks of New England: Land uses, geochemical fingerprints, and regulatory limits. *Geological Society of America Abstracts with Programs*, Vol. 41, No. 7, p. 331.
- Shafer, T. D. *, Estes E. *, Carter-Thomas M. R. *, Clark H., Guenther W., **Brabander D. J.** (2009) Geospatial-geochemical analysis of heavy metals in the Neponset River: Fate, transport and geochemical fingerprint of sediment in a historic New England watershed. *Geological Society of America Abstracts with Programs*, Vol. 41, No. 7, p. 331.
- Smith J. P., **Brabander D. J.**, Besancon J. R., Millholland L. C., Gregory M. J., and Coffin R. B. (2009) Mineralogy, Bacterial Species Diversity, and Bioavailable Trace-Element Loading on the Silt/Clay Fraction of Surficial Sands from Iraq and Kuwait. *Scientific Programme, The AIPEA 14th International Clay Conference*, Castellana Marina, Italy: Abstract HE4.Tue.L2.
- 2008 Estes E. R. *, Shafer T. D. *, **Brabander D. J.** (2008) Comparing spatial and temporal trace metal geochemical signatures in two branches of the Neponset River Watershed. *North Atlantic Chapter of the Society for Environmental Toxicology and Chemistry 14th Annual Meeting*, Bar Harbor, ME.
- McCarthy K. M. *, **Brabander D. J.**, Schaider L., Argow B., Khoo M. *, Flynn N., Shine J. (2008) Evaluating the risk of exposure to Pb, Zn, and Cd after a major flood at a mining-impacted area. *Geological Society of America Abstracts with Programs* Vol. 40, No. 6, p. 340.
- Stewart T. J. *, Flynn N. F., **Brabander D. J.**, Allen M. M. (2008) Investigation and application of *chlamydomonas reinhardtii* for accumulation of lead (II) from freshwater. *Abstracts of Papers, 235th ACS National Meeting*; American Chemical Society: New Orleans, 2008, COLL-184.
- Smith, J. P., M. J. Gregory, D. J. **Brabander**, L. C. Millholland, J. R. Besancon. (2008) Size-Specific Characterization of Sands and Dust Collected from Iraq and Northern Kuwait: Factors Influencing Bacterial Species Composition and Trace Element Bioavailability. *EOS Trans. Amer. Geophys. Union*, 89(53), Fall Meet. Suppl., Abstract A43A-0281 (Poster).

- 2007 McCarthy K. M. *, **Brabander** D. J., Khoo M. *, Schaider L., Senn D., Shine J. (2007) Characterization of zinc, lead, and cadmium in a mine waste impacted area: Implications for fate and transport. *Geological Society of America Abstracts with Programs* Vol. 39, No. 6, p. 404.
- Brabander** D. J., Pighetti E. H. * (2007) Spatial and temporal trace metal geochemical signatures in urban pond sediments: Recorders of past land use in the Neponset River Watershed. *North Atlantic Chapter of the Society for Environmental Toxicology and Chemistry 13th Annual Meeting*, Bristol, RI.
- Erdil R. M. *, Flynn N. T., **Brabander** D. J. (2007) The geochemical history of Lake Waban, Wellesley, Massachusetts. *Geological Society of America Abstracts with Programs* Vol. 39, No. 1, p. 102.
- Erdil R. M. *, Flynn N. T., **Brabander** D. J. (2007) Deciphering the geochemical history of Lake Waban, Wellesley, Massachusetts. *Abstracts of Papers, 234th ACS National Meeting*; American Chemical Society: Chicago, 2007, CHED-1107.
- Khoo M. *, Schaider L., McCarthy K. *, Shine J., Senn D., **Brabander** D. J. (2007) Characterization of toxic metal transport processes downstream of the Tar Creek Superfund Site. *Geological Society of America Abstracts with Programs* Vol. 39, No. 1, p. 102.
- Schaider L. A., Senn D. B., **Brabander** D. J., McCarthy K. D. *, Shine J. P. (2007) Characterizing the lability and bioavailability of zinc, lead and cadmium in mine waste. *North Atlantic Chapter of the Society for Environmental Toxicology and Chemistry 13th Annual Meeting*, Bristol, RI.
- Smith J. P., Bullen T. D., **Brabander** D. J., Gontz A. M., Olsen C. R. (2007) Strontium isotope record of seasonal scale variations in sediment sources and sediment trapping in low-energy, subtidal areas of the Lower Hudson River Estuary. *Geological Society of America Abstracts with Programs* Vol. 39, No. 1, p. 83.
- 2006 Bell J. R. *, **Brabander** D. J., Flynn N. T. (2006) Use of polyNIPAm hydrogels for metal uptake from aqueous systems. *Abstracts of Papers, 231st ACS National Meeting*; American Chemical Society: Washington, D.C., 2006, CHED-865.
- Brabander** D. J. (2006) Geohazards and the urban environment: Highlighting research at the intersection of public health, outreach, and education. *Geological Society of America Abstracts with Programs* Vol. 38, No. 7, p. 155.
- Clark H. F. *, **Brabander** D. J., Hausladen D. M. * (2006) Tracing urban soil lead from the source to the human system. *Geological Society of America Abstracts with Programs* Vol. 38, No. 7, p. 135.
- Hausladen D. M. *, **Brabander** D. J., Kunce K. H. * (2006) Elevated lead concentrations in urban garden soil: The risks of compost as a remediation tool. *Geological Society of America Abstracts with Programs* Vol. 38, No. 7, p. 136.
- Grant C. *, Wall A. *, **Brabander** D. J. (2006) Spatial and temporal trace metal geochemical signatures in urban ponds: Recorders of past land use – indicators of future development. *Geological Society of America Abstracts with Programs* Vol. 38, No. 1, p. 35.
- McCarthy K. D. *, Schaider L., **Brabander** D. J., Senn D., Shine J. (2006) Metals and human health: The characterization of toxic metals from mine waste at the Tar Creek Superfund Site and assessment of exposure to the Tar Creek community. *Geological Society of America Abstracts with Programs* Vol. 38, No. 1, p. 37.
- Schaider L. A., Senn D. B., **Brabander** D. J., Holton M. W., McCarthy K. D. *, Serdakowski M. C., Shine J. P. (2006) Mine waste piles as a source of metal contamination at the Tar Creek Superfund Site. *Geological Society of America Abstracts with Programs* Vol. 38, No. 1, p. 37.
- Zota A. R., Ettinger A., Schaider L. A., Wright R., **Brabander** D. J., Spengler J. (2006) Children's exposure assessment study near a mining-related Superfund site. *American Public Health Association 134th Annual Meeting*.
- Zota A. R., Schaider L. A., **Brabander** D. J., Wright R. O., Osborn M., Spengler J. D. (2006) Residential exposures to metals in homes near the Tar Creek Superfund site. *Geological Society of America Abstracts with Programs* Vol. 38, No. 1, p. 36.
- 2005 **Brabander** D. J., Beattie R., Chen R. F., Ford D. J. (2005) From inquiry in the schoolyard to the PowerPoint large lecture hall: Strategies for re-kindling curiosity about Earth processes. *Invited speaker ASLO Aquatic Sciences Annual Meeting* Salt Lake City.
- Clark H. *, Erdil R. *, **Brabander** D. J. (2005) Characterization, speciation and remediation of lead in urban garden soils. 21st Annual International Conference on Soils, Sediments and Water, Amherst, MA. Abstract Book p. 192.
- Clark H. *, Erdil R. *, **Brabander** D. J. (2005) The goal of sustainable urban gardening with the challenge of lead contaminated soil. *Geological Society of America Abstracts with Programs* Vol. 37, No. 1, p. 62.

- McGuire M. J., Blute N. K., Hamilton C., **Brabander D. J.** (2005) Why are there leopard spots floating on my reservoir? CA-NV section meeting of AWWA, Reno NV.
- Schaidler L. A., Senn D. B., **Brabander D. J.**, Holton M. W., Shine J. P. (2005) Metal speciation and mobility in mine waste piles and surface waters in a mine-impacted area. SETAC North America 26th Annual Meeting.
- Shailer M., **Brabander D. J.** (2005) Environmental biomonitoring of Cr and As in shallow groundwater: Do red oak trees preserve long-term records of contaminant loading? *EOS Trans. AGU*, 86(18), Jt. Assem. Supple., Abstract B33B-02.
- Wall A. M. *, **Brabander D. J.** (2005) Volcanic chemostratigraphy on the outcrop using field-portable X-ray fluorescence: An example from the basaltic flow of Hewitt's Cove, MA. *EOS Trans. AGU*, 86(18), Jt. Assem. Supple., Abstract V13B-11.
- 2003 **Brabander D. J.**, Beattie R. B., Stevenson R. D., Shailer M., Chen R. F. (2003) Participatory activities for core ocean science and environmental science concepts: An example and call to action. ASLO Annual Meeting Salt Lake City, p. 30.
- Chen R. F., **Brabander D. J.**, Beattie R., Stevenson R., Crago T., Padawer S. Ocean Science Concept Mapping: What people need to know about ocean sciences. OCEANS (2003) Meeting, San Diego, September 22-26, 2003.
- Chen R. F., Dong H., Lukas G., Stevenson R. D., Brabander D. J., Beattie R. (2003) An innovative web-based survey for establishing core-learning goals for all ocean and environmental science students. ASLO Annual Meeting Salt Lake City, p. 36.
- Moroski C. A. *, Herbst A. *, Beattie R. B., **Brabander D. J.** (2003) Pb concentrations in drinking water on campus: analysis and remediation. *Geological Society of America Abstracts with Programs* Vol. 35 No. 3, p. 74.
- Ross L. *, **Brabander D. J.**, Beattie R. (2003) Project Play-Safe: A Survey of City of Boston Tot-lots Using a Field Portable XRF. 19th Annual International Conference on Soils, Sediments and Water, Amherst, MA. Abstract Book p. 179.
- 2002 **Brabander D. J.**, Oktay S. D., Smith J. P., Kada J., Bullen T., Olsen C. (2002) Geochemical fingerprinting of the World Trade Center attack in New York Harbor sediments. *EOS Trans. AGU*, 83 (47) Fall Meet. Suppl., Abstract OS22B-0278.
- Chen R. F., **Brabander D. J.** (2002) Inquiry based learning and assessment in general education science courses. *EOS Trans. AGU*, 83 (4) Ocean Sciences Meet. Suppl. Abstract OS211-02, p. 115.
- Keon N. E., Swartz C. H., **Brabander D. J.**, Myneni S. C. B., Sutton S., Hemond H. F. (2002) A combined XAS and chemical extraction investigation of arsenic distribution in sediment phases and in cattail roots. *American Chemical Society Proceedings (Spring)*, Division of Geochemistry.
- Oktay S. D., Smith J. P., **Brabander D. J.**, Kada J., Olsen C. (2002) Spatial distributions of Iodine-131 and the geochemical "fingerprint" from the World Trade Center terrorist attack in New York Harbor sediments. *EOS Trans. AGU*, 83 (47) Fall Meet. Suppl., Abstract OS22B-0280.
- Smith J. P., Oktay S. D., **Brabander D. J.**, Olsen C., Kada J. (2002) Temporal movement of the geochemical "fingerprint" of the World Trade Center terrorist attack in New York Harbor sediments. *EOS Trans. AGU*, 83 (47) Fall Meet. Suppl., Abstract OS22B-0279.
- Smith J. P., Oktay S. D., Kada J., **Brabander D. J.**, Olsen C. R. (2002) Short-term sediment dynamics in the lower Hudson River estuary: Identifying the impact of the World Trade Center terrorist attack. *EOS Trans. AGU*, 83 (4) Ocean Sciences Meet. Suppl. Abstract OS225-07, p. 189.
- 2001 Bulleri M. E., Coleman D. S., **Brabander D. J.** (2001) Combined IDTIMS and LAM-ICP-MS dendrochemical study of a depleted uranium and heavy metal contaminated bog near Concord, Massachusetts. *Geological Society of America Abstracts with Programs*, V. 33 No. 6, p. A-119.
- Harvey C. F., Swartz C. H., Ali A., Yu W., Beckie R., Niedan V., Hug S., Keon N., Islam S., **Brabander D. J.**, Rahman M., Rahman H., Hemond H., Ahmed F. (2001) A geochemical and hydrological analysis of arsenic mobilization at a field site in Bangladesh. *EOS Trans., AGU*.
- 2000 **Brabander D. J.**, Stanley R. H. R. *, Hemond H. F. (2000) Reconstructing historical and contemporary lead sources in an urban watershed: A rapid assessment method and example from the Aberjona Watershed, MA, USA. *EOS Trans. AGU*, 81, no. 48, p. F479.
- Bulleri M. E., Coleman D. S., **Brabander D. J.** (2000) LAM-ICP-MS assessment of the uptake and mobility of trace metals in black oak. *EOS Trans AGU*, 81, no. 48, p. F221.
- Keon N. E., Swartz C. H., **Brabander D. J.**, Myneni S. C. B., Hemond H. F. (2000) Evaluation of arsenic mobility in sediments using a validated extraction method. *EOS Trans., AGU*, 81, no. 48, p. F526.
- Swartz C. H. et al. (2000) The arsenic crisis in Bangladesh: A geochemical analysis. *EOS Trans. AGU*, 81, no. 48, p. F550.

- 1999 **Brabander D.**, Keon N., Hemond H. F. (1999) Biogeochemical controls on the sequestration of contaminants in urban wetlands. *Geological Society of America Abstracts with Programs*, v. 31, no. 7, p. 494.
- Edmunds J. D. *, **Brabander D. J.**, Coleman D. S. (1999) Uptake and mobility of uranium in black oaks: Implications for biomonitoring depleted uranium-contaminated groundwater. *Geological Society of America Abstracts with Programs*, v. 31, no. 7, p. 190.
- Gawel J. E., **Brabander D. J.**, Morel F. M. M., Hemond H. F. (1999) Using bioindicators to monitor past and present arsenic contamination in groundwater near two Superfund sites in Woburn, Massachusetts. *EOS Trans. AGU*, 80, no. 17, p. S147.
- 1998 **Brabander D. J.**, Keon N., Stanley R. H. R. *, Hemond H. F. (1998) *In situ* mapping of trace metal uptake and radial translocation in *Quercus rubra*. *EOS Trans. AGU*, 79, no. 45, p. F956.
- Brabander D. J.**, Keon N., Stanley R. H. R. *, Hemond H. F. (1998) Seasonal variability of toxic metals in red oak xylem tissue: Implications for environmental monitoring. *EOS Trans. AGU*, 79, no. 17, p. S136.
- Keon N., **Brabander D. J.**, Stanley R. H. R. *, Hemond H. F. (1998) Sequestration of toxic metals in an urban wetland. *EOS Trans. AGU*, 79, no. 17, p. S137.
- 1996 **Brabander D. J.**, Giletti B. J. (1996) Rotated Rb-Sr whole rock isochrons revisited: An example from the Lyndhurst Pluton, Frontenac Terrain, Ontario, Canada. *EOS Trans. AGU*, 77, no. 46, p. F821.
- Brabander D. J.**, Wenner J. M., Ford D. J. (1996) The practical introduction of group assessment vehicles into the upper-level Earth Sciences curriculum. *Geological Society of America Abstracts with Programs*, V 28 (7) p. A-165.
- 1995 **Brabander D. J.**, Giletti B. J. (1995) Rb-Sr whole rock - mineral systematics and Sr diffusion kinetics: Constraints on the cooling history of the Lyndhurst pluton, Grenville Province, Canada. *EOS Trans. AGU*, 76, no. 46, p. F704.
- Brabander D. J.**, Giletti B. J. (1995) Test of a new method to determine cooling histories of igneous intrusions using Rb-Sr systematics and Sr diffusion kinetics. *Geological Society of America Abstracts with Programs* V27, p. A421.
- Giletti B. J., **Brabander D. J.**, Smith H. A. (1995) Diffusion kinetics, thermal histories, and where do the radiogenics go? *EOS Trans. AGU*, 76, no. 46, p. F704.

INVITED LECTURES

- 2011 Salem State University, Darwin Festival, Department of Biology “*Humans in the built environment: The emerging interface between medical geosciences and public health*”
Wellesley College, Albright Institute, “*Pathways and Expressions of Sustainability: Identifying Vision and Executing Practice*”
- 2010 Brown University Department of Geological Sciences Colloquium Series: “*Urban lead geochemistry: Assessing the relative importance of exposure pathways to bioaccessibility*”
Marine Biological Science Ecosystems Center Seminar Series “*Urban geochemistry and emerging lead exposure pathways*”
- 2009 Lawrence University and University of Wisconsin Oshkosh Department Seminars
Medical Geology: The Interface between Environmental Engineering and Public Health: Case Studies from the Urban Environment
- 2008 Wellesley College Sciences Faculty Seminar Series: “*Medical Geology: The Interface between Environmental Engineering and Public Health*” Case study I: Lead in Urban Gardens
Wellesley College Environmental Studies Faculty Seminar: “*Medical Geology: The Interface between Environmental Engineering and Public Health*” Case study II: Heavy Metal Migration at the Tar Creek Superfund Site, Oklahoma
- 2005 Brown University Department of Geological Sciences Colloquium Series: X-ray analysis of environmental materials: From the field portable to the synchrotron source
- 2005 Binghamton University Department of Geological Sciences and Environmental Studies: X-ray analysis of environmental materials: From the field portable to the synchrotron source
- 2004 Wellesley College, Summer Symposium, Fingerprinting pollutants and environmental health in the built environment
- 2001 UMass-Boston ECOS seminar series: “*Uptake of Cr, As, and U in Oaks: Lessons from two NPL sites in Massachusetts and implications for environmental biomonitoring*”
- 1999 EPA Region 1 (BOSTON) seminar series: Toxic metal management in an urban watershed: the Mystic/Aberjona river basin “*Patterns of metal contamination in tree rings revealed by SIMS: A chronology of groundwater contamination?*” D. Brabander and H. Hemond

- 1999 EPA Region 1 (BOSTON) seminar series: Toxic metal management in an urban watershed: the Mystic/Aberjona river basin "Arsenic and lead in soils and riverine sediments of the lower Aberjona valley," R. Stanley and D. Brabander

SPONSORED PROJECTS

Pending funding

- 2011-2016 **National Science Foundation (NSF)** Defining Geoscience for Recruiting, Education and Employment (DEGREE). Bob Chen (PI) Wellesley Partner, \$254,993 (submitted)
- 2011-2012 **National Science Foundation (NSF)** MRI: Establishment of the Boston Environmental (Gamma-) Radiation Facility (BEGRF): Multidisciplinary Research and Training in Urban Geochemistry and Sustainability at an Undergraduate College. PI \$437,157 (To be submitted).
- 2010-2012 **National Science Foundation (NSF)** MRI-R²: Acquisition of an Environmental Scanning Electron Microscope for Multidisciplinary Research and Training in Geosciences, Chemistry, and Biology at an Undergraduate College. Co-PI. \$734,168. (Denied: Resubmittal planned)

Current funding

- 2010-2014 **National Institutes of Health (NEIHS)** Geochemical Processes Affecting Temporal Variability in the Bioaccessibility of Metals in Soil. Harvard School of Public Health, Dr. Robert Wright, (PI). Subcontract: \$72,292.
- 2010-2012 **Brachman Hoffman Fellowship (Wellesley College)** Emerging urban land use patterns and fine particulate matter: Implications for respiratory lead exposure pathways in the context of urban agriculture. Principal Investigator. Award: \$39,933
- 2006-2011 **Neponset River Watershed Association (Barr Foundation)** Beyond surface water quality: Leveraging the restoration of an urban river. Subcontract award: \$70,350

Previous funding

- 2008-09 **Faculty Award (Wellesley College)** Extreme events and public health: Fate and transport of heavy metals in a historic mining district in response to fifty year flood and EF4 tornado, Northeastern Oklahoma. Award: \$5,900
- 2007-08 **US Environmental Protection Agency (EPA)** Healthy Communities Grants Program from The Food Project. Subcontract award: \$5,000.
- 2006-09 **National Institutes of Health (NIH 5-P01 ES012874-03)** Metal mixtures and children's health. Harvard School of Public Health, Dr. Joseph Brain, (PI). Subcontract award \$68,857
- 2006-07 **Malcolm Pirnie, Inc.** Glendale hexavalent chromium pilot project. Subcontract award: \$10,311
- 2004-05 **Department of Defense (DOE) MIT-DOE DE-FG07-02ID14377 Reactor sharing grant** Environmental biomonitoring of Cr and As in shallow groundwater: Do red oak trees preserve long term records of contaminant loading? Renewal award: \$27,000
- 2004 **Brachman-Hoffman Small Grant, Wellesley College** Sustainable urban community gardening: The challenge of elevated lead concentrations in soil. Award: \$3,000
- 2004 **Staley Small Grant, Wellesley College** Assessing the mobility of arsenic from pressure treated wood in the playground environment. Award: \$3,480
- 2004 **Faculty Award, Wellesley College** Fingerprinting urban sources of lead. Award: \$1,680

Previous funding record at UMB

- 2003-06 **NSF-GK12 (Contributing personnel)** Responsibilities: linking undergraduate interns with graduate students
Award: \$1.5 million – Chen R. F. PI

- 2003 **MIT-DOE Reactor sharing grant (PI)**
Environmental biomonitoring of Cr and As in shallow groundwater: Do red oak trees preserve long-term records of contaminant loading? Award: \$28,200 (\$3,200 UMB cost share)
- 2002-06 **NSF- NER-COSEE (Senior Personnel)**
Responsible for writing sections of grant and running workshops focused on undergraduate ocean education. Award: \$2.5 million (\$256K UMB share – Chen R. F. PI)
- 2002 **Healey grant-UMass-Boston (Co-PI)**
Building competitiveness for an Earth Sciences NSF-REU application in AY 2002-2003:
Demonstration of an easily transportable research experience for undergraduates based on campus-wide water testing program. Award: \$3,638

PEER REVIEWER

National Science Foundation
Canadian Journal of Forest Research, Earth and Planetary Science Research Letters, Geochimica Cosmochimica Acta, Soil and Sediment Contamination, Environmental Science and Technology

TEACHING/MENTORING RECOGNITION

- 2010 **Anna and Samuel Pinanski Prize for Teaching Excellence, Wellesley College**
2008-2011 **Council on Undergraduate Research (CUR), Washington DC**
Elected Geosciences Councilor, Attend annual meetings – leadership in undergraduate research as pedagogy. Developed and lead subcommittee to establish a national award recognizing an individual that has served as a long-term role model in mentoring undergraduate research.

WELLESLEY COLLEGE COURSES

GEOS 101 Earth Processes and the Environment with Lab
GEOS 102 Dynamic Earth with Lab
GEOS/ES 201 Methods and Problems in Environmental Science with Lab
GEOS 203 Earth Materials with Lab
ES 300 Environmental Issues
GEOS/ES 315 Environmental Geochemistry with Lab
GEOS 320 Isotope Geology

Previous Institutions

Physical Geology (Salem State College)
The Nature of Environmental Problems (UMass-Boston)
Introduction to Geochemistry (Boston University)
Environmental and Forensic Geochemistry (UMass-Boston)
Igneous and Metamorphic Petrology (Boston University)
Environmental Problem Analysis and Policy Formulation (UMass-Boston)
Aquatic Chemistry (MIT)

UNDERGRADUATE RESEARCH STUDENTS

Honors theses (primary advisor)

6. Emily Estes ('10, Geosciences), Chemical and physical characterization of naturally precipitated hydrous ferric oxides at the Tar Creek Superfund Site, Oklahoma.
5. Sarah Hurley ('10, Geosciences), Long-term paleoclimate reconstruction of the Indian Monsoon using molecular proxies.
4. Kathleen McCarthy ('08, Environmental Chemistry), Designing a geochemical and sedimentological approach to evaluate the risk of exposure to Pb, Zn, and Cd: A case study of a major flood event at the mining-impacted Tar Creek, Northeastern Oklahoma.
3. Emily Pighetti ('08, Environmental Studies), Geochemical Signatures in a Suburban Watershed: A study of the sedimentological fate, transport, and legacy of industrialization in the East Branch of the Neponset River, Canton Massachusetts.
2. Heather Clark ('07, Environmental Studies), Tracing Lead from the source to the human system: A study of the environmental cycle, geochemistry, bioaccessibility, and human health risks of lead in urban garden soils.
1. Rachel Erdil ('07, Environmental Chemistry), Deciphering the geochemical history of Lake Waban.

Co-advised theses

1. Thea Stewart ('08, Chemistry), Investigation and application of *chlamydomonas reinhardtii* for accumulation of lead (II) from freshwater.

Independent research students

- 2010 Emily Estes '10 (S10-GEOS370), Sarah Hurley '10 (S10-GEOS370), Nooreen Meghani '11 (F10-GEOS350), Casey Sedlack (F10-GEOS350), Fanny Tang (F10-GEOS350), Ellen Willis-Norton (F10-GEOS350), Phoebe Handler '12 (F10-GEOS250), Elizabeth Lillard '11 (F10-GEOS250), Shontelle Brathwaite '11 (F10-ES250H), and Sooyeon Kho '11 (F10-ES250H)
Summer research group: Full time: Isabella Gambill '12 (ES) co-advised with Jay Turner, Environmental Studies., Deva Shafer '10 (ES), and Fanny Tang (Environmental Chem.) '11 (Environmental Chemistry) Part-time: Alex Hatem '12 (GEOS), Megan Carter-Thomas '10 (GEOS), Emily Estes '10 (GEOS), Nooreen Meghani '11 (GEOS)
- 2009 Megan Carter-Thomas (F09-GEOS 350) Trace metal concentrations in urban parks of New England: Land uses, geochemical fingerprints, and regulatory limits (GSA national conference poster).
Summer research group: Megan Carter-Thomas '10 (GEOS), Heather Clark '07 (ES) Emily Estes '10 (GEOS), Kathleen McCarthy '08 (environmental chemistry), Nooreen Meghani '11 (GEOS) Deva Shafer '10 (ES)
- 2008 Kitt Kunce '08 (S08-GEOS 350) The effect of redox conditions on the release of phosphorous from lake sediments (Ruhlman poster)
Summer research group: Megan Carter-Thomas '10 (GEOS), Kathleen McCarthy '08 (Environmental Chemistry), Deva Shafer '10 (ES), Elizabeth Denis, Brown Chemistry REU student (Presented at Bridgewater State ACS conference New England Environmental Chemistry)
- 2007 Debra Hausladen (F07-ES250H), Emily Pighetti (S07/F07-ES360-370), Heather Clark (S07-ES370), Rachel Erdil (S07-CHEM370)
Summer research group: Kathleen McCarthy '08 (Environmental Chemistry, Relena Ribbons (ES)'09, and Emily Pighetti (ES) '08
- 2006 Christine Grant '06 (GEOS 350) Spatial and temporal trace metal geochemical signatures in urban ponds: Records of past land use – indicators of future development (GSA poster and Ruhlman poster)
Debra Hausladen '09 (summer research) Lead inventories in garden compost in Boston and Wellesley (summer program poster)
MieAi Khoo '08 (summer research) Sedimentological records of mining metals (Pb and Zn) in Tar Creek and Neosho Rivers, Oklahoma (summer program poster)
Emily Knurek '07 (ES250) Geochemical analysis of yard soils from the Tar Creek Superfund region (presentation to Harvard research group)
Kitt Kunce '08 (summer research) Historical geochemical fingerprints in an urban watershed: East Branch Neponset River, Canton, MA (summer program poster)
Kathleen McCarthy '07 (GEOS 350, summer research) Mine waste piles as a source of metal contamination at the Tar Creek Superfund Site (GSA oral presentation and summer program poster)
Emily Pighetti '07 (ES350) Similar Strategies with Different Goals: The United States' and Finland's Search for Energy Alternatives (final paper)
Relena Ribbons '09 (GEOS 350) Investigating the historical background of Revere Copper Mill in Canton, MA (Ruhlman poster presentation)
Theodora Stewart '07 (BIO 350, co-advised) Heavy metal adsorption to bacterial surfaces: Possibilities for natural attenuation of contaminated fresh water systems (Ruhlman poster presentation)
Naomi Wells '07 (GEOS 360, summer research) Predicting the long-term behavior of crude oils in the coastal marine environment through compositional analysis of the sediments (Ruhlman presentation and summer program poster)
- 2005 Cynara Cannatella '06 (GEOS 360 and summer research) A GIS and hydrogeological study of Paramecium Pond, Wellesley, MA (GIS maps)
Heather Clark '07 (ES 350 and summer research) Characterization, speciation and remediation of lead in urban garden soils (21st Annual International Conference on Soils, Sediments and Water, awarded best student poster)
Rachel Erdil '07 (GEOS 350) Deciphering the geochemical history of Lake Waban (Ruhlman poster)
Christine Grant '06 (ES 350 and summer research) Spatial and temporal trace metal geochemical signatures in urban ponds: Records of past land use – indicators of future development (summer program poster)
Cathryn Johnson '05 (ES 350) Where could Wellesley's food come from? (Ruhlman poster)
Kathleen McCarthy '07 (GEOS 350 summer research) Mine waste piles as a source of metal contamination at the Tar Creek Superfund Site (GSA oral presentation and summer program poster)
Anna Wall '05 (GEOS 360 and summer research) Volcanic chemostratigraphy on the outcrop using field-portable X-ray fluorescence: An example from the basaltic flow of Hewitt's Cove, MA (AGU poster and Ruhlman poster)

- Naomi Wells '07 (GEOS 350, summer research) Predicting the long-term behavior of crude oils in the coastal marine environment through compositional analysis of the sediments (final paper/proposal)
- 2004 Kristen Blanton '04 (Independent research project) Sustainable urban community gardening: The challenge of elevated lead concentrations in soil (Ruhlman presentation)
- Miranda Brintnell '07 (summer research) Designing a new lab unit for Earth Processes and the Environment: Chemical and physical measurements in Paintshop Pond Brook (summer program poster)
- Kate Doiron '05 (GEOS 350) Impacts of historical use and gradients on lead and arsenic concentrations in soil profiles, Middlesex Fells, MA (Ruhlman poster)
- Rachel Erdil '07 (summer research) Pressure treated wood in playgrounds: Arsenic concentrations in soil and leaching processes (Tanner presentation)
- Catherine Silvey '07 (GEOS 350) Making a mountain out of a mudflat: the geological and ecological importance of mudflats (Tanner presentation)

GRADUATE RESEARCH STUDENTS

- 2006 Mark Shailer (MS, UMass-Boston) Environmental biomonitoring of Cr and As in shallow groundwater: Do red oak trees preserve long-term records of contaminant loading? (AGU presentation)

SYNERGISTIC ACTIVITIES

2001–2003 **University of Massachusetts Boston**

Director, Undergraduate Environmental Studies Program

Responsible for all operations of the ESP including hiring adjuncts, program development, advising of 50+ students in the program, and teaching at all levels in the program.

Project Coordinator, Undergraduate Mentoring in Environmental Biology

This NSF-funded program sought to increase participation of under-represented students in the field of environmental biology.

Workshop participation

- 2009 Presenter, NSF funded **Council on Undergraduate Research** “Establishing and Sustaining an Undergraduate Research Program: A professional development workshop for new and future faculty”
- 2002 **Project Kaleidoscope summer institute** “Environmental Sciences: Connecting to the Community”
- 2001 **NSF-sponsored summer workshop** “New Approaches and Techniques for Teaching Science: Addressing Environmental Problems to Stimulate Undergraduate Learning”

Science Education and Communication

1997–1998 **Education Development Corporation, Newton MA**

Consultant. Analyzed environmental projects developed by high school teachers.

1997–1998 **Massachusetts Corporation for Educational Telecommunications, Cambridge MA**

Aided in content and appeared in TV shows for high school classrooms.

1991–1999 **Horn Book, Inc., Boston MA**

Reviewer for *The Horn Book Guide to Children's and Young Adult Books*.

Guest reviewer for *The Horn Book Magazine*. Wrote book reviews of science publications.

RESEARCH ADVISORS

Postdoctoral advisor

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PhD Dissertation advisor

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MS Thesis advisor

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