

*CURRICULUM VITAE*  
**Daniel Joseph Brabander**

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**PROFESSIONAL PREPARATION**

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

**APPOINTMENTS**

Summer 2003–  
Present      **Wellesley College, Wellesley MA**  
Department of Geosciences  
*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 reform

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

Fall 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 multidisciplinary projects that cut across departmental boundaries and foster collaboration among biologists, chemists, geologists and environmental engineers and involve research experiences for undergraduates. Current research focus is environmental geochemistry and the quantification of biogeochemical processes in watersheds, aquifers, and in the urban environment. Applications include bioremediation, environmental biomonitoring, fate and transport of contaminants (toxic metals) in watershed and aquifer systems, isotopic dating and mapping of contaminants within sediments and soils, and sustainable urban agriculture.

## PUBLICATIONS (\* = undergraduate author)

- 2007 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.
- 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.
- 2006 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.
- 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.
- 2005 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.
- 2004 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.
- 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.
- 2003 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.
- 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.
- 2002 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.
- 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.
- 2001 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.
- 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.
- 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.
- 1999 **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.
- 1995 **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.

**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

Clark H. F. \*, Hausladen D. M. \*, **Brabander D. J.** (2008) Urban gardens: lead exposure, recontamination mechanisms, and implications for remediation design. Submitted: *Environmental Research*.  
Blute N. K., Jay J. A., Swartz C. H., **Brabander D. J.**, Hemond H. F. (2008) Aqueous and solid phase arsenic speciation in the sediments of a contaminated wetland and riverbed. Submitted: *Applied Geochemistry*.

#### MANUSCRIPTS IN PREPARATION

**Brabander D. J.**, Stanley R. H. R. \*, Hemond H. F. (2007) Isotopically mapping multiple Pb sources on an urban watershed using a rapid assessment method. To be submitted: *Journal of Environmental Quality*.  
Ross L. \*, Beattie R. B., **Brabander D. J.** (2007) Fingerprinting arsenic released from pressure treated wood in playground soils. To be submitted: *Journal of Environmental Quality*.

#### TECHNICAL REPORTS, CONFERENCE PROCEEDINGS, AND EDITORIALS

- 2006 McGuire M. J., Blute N. K., Hamilton C., Brabander D. J. (2006) Formation of floating calcite rafts in a drinking water reservoir. In press: *American Water Works Association*
- 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 (SINCE 1995)

- 2007 McCarthy K. M. \*, **Brabander D. J.**, Khoo M. \*, Schaidler 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 13<sup>th</sup> 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.
- Khoo M. \*, Schaidler 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.
- Schaidler L. A., Senn D. B., **Brabander D. J.**, McCarthy K. D. \* and 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 13<sup>th</sup> 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.**, Kuncze 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. \*, Schaidler 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.
- Schaidler 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., Schaidler 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 134<sup>th</sup> Annual Meeting*.
- Zota A. R., Schaidler 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. 21<sup>st</sup> 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 26<sup>th</sup> 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. 19<sup>th</sup> 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.
- Edmands 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

- 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
- 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

### Current funding record at Wellesley

- 2006-2010 **Neponset River Watershed Association**  
Beyond surface water quality: Leveraging the restoration of an urban river  
Subcontract award: \$70,350
- 2006-07 **Malcolm Pirnie, Inc.**  
Glendale hexavalent chromium pilot project  
Subcontract award: \$10,311
- 2006-08 **NIH 5-P01 ES012874-03**  
Metal mixtures and children's health. Subcontract award \$45,857 from Harvard School of Public Health, Dr. Howard Hu, Principal Investigator.
- 2004-07 **Howard Hughes Medical Institute: Undergraduate Science Education Program**  
Provided text for proposal including project descriptions and served as advisory committee member. Award: \$1,200,000 Institutional Grant awarded to Wellesley College
- 2004-05 **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**  
Sustainable urban community gardening: The challenge of elevated lead concentrations in soil.  
Award: \$3,000
- 2004 **Staley Small Grant**  
Assessing the mobility of arsenic from pressure treated wood in the playground environment.  
Award: \$3,480
- 2004 **Faculty Award**  
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

## COURSES TAUGHT

### *Wellesley College*

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

### *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)*

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. Currently enrolled in PhD program at Yale School of Forestry.
1. Rachel Erdil ('07, Environmental Chemistry), Deciphering the geochemical history of Lake Waban. Currently enrolled in MA program in Environmental Science at Trinity College, Dublin.

### *Independent research*

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 Kuncie '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 (21<sup>st</sup> 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: Recorders 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**

- 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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