

Dr. Matthew J. Evans

Department of Chemistry Wheaton College

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EDUCATION

Ph.D. (August 2002)

Department of Earth & Atmospheric Sciences Cornell University: Ithaca, New York

Ph.D. in Geochemistry, minors in Atmospheric Sciences and Petrology

Dissertation title: *Geothermal fluxes of solutes, carbon, and heat to Himalayan rivers*

Committee members: Louis Derry (chair), William White, Kerry Cook

M.S. (August 1997)

Department of Earth & Atmospheric Sciences Cornell University: Ithaca, New York

M.S. in Geochemistry, minor in Petrology

Thesis title: *Geochemistry of an Early Proterozoic (Birimian) greenstone belt, West Africa*

Committee members: Kodjo Atttoh (chair), William White

B.A. *cum laude* (May 1994)

Department of Geology Middlebury College: Middlebury, Vermont

Thesis title: *Geochemistry of meta-volcanic rocks of north-central Vermont*

PROFESSIONAL APPOINTMENTS

- 2013–present Associate Professor, Department of Chemistry and Environmental Science Program, Wheaton College
Courses taught: Current Problems in Environmental Chemistry, Chemical Principles, Inorganic Reactions, Aqueous Equilibria, Chemistry of Natural Waters, Water (First-year seminar), Earth, Wind, and Fire: Science of the Earth System, Chemistry and Your Environment, Instrumental Analysis, Senior Seminar.
- 2007–2013 Assistant Professor, Wheaton College
- 2005–2007 Assistant Professor, Department of Geology, Environmental Science and Policy Program, The College of William & Mary
Courses Taught: Physical Geology, Environmental Geology, Environmental Geochemistry, Aqueous Geochemistry (graduate course)
- 2003–2005 Postdoctoral Researcher, Chemical and Isotopic Mass Spectrometry Group, Oak Ridge National Laboratory
- 2002–2003 Visiting Assistant Professor, Department of Geology, Hamilton College
Courses taught: Hydrogeology, The Himalayas, Low-Temperature Geochemistry
- 2000–2001 Research Assistant Department of Earth & Atmospheric Sciences, Cornell University
- 1999–2000 NASA Research Fellow, Department of Earth & Atmospheric Sciences, Cornell University
- August 1998 Lecturer in Geology, Department of Geology and Environmental Science, Hartwick College
Courses taught: Water Chemistry and Geology of Switzerland
- 1994–1998 Teaching Assistant, Department of Earth & Atmospheric Sciences, Cornell University

FELLOWSHIPS AND GRANTS

- NSF Office of Polar Programs, Arctic Natural Sciences Program (awarded 2012): \$943,326
Collaborative Research: Investigating the Influence of Sea-surface Variability on Ice Sheet Mass Balance and Outlet Glacier Behavior using Records from Disko Bugt, West Greenland with S. Das (Lead PI, Woods Hole Oceanographic Institution), K. Frey (PI, Clark University), and B. Smith (PI, University of Washington), M. Evans (PI, Wheaton College), \$139,105 to Wheaton.
- NSF: Major Research Instrumentation (awarded 2011): \$36,179
MRI: Acquisition of an Ion Chromatograph to Support Research and Undergraduate Education.
M. J. Evans, PI, Wheaton College.
- NASA: Interdisciplinary Research in Earth Science (awarded 2010): \$707,112
An interdisciplinary study of recent ice sheet melt, sea ice decline, and enhanced ocean biological productivity along the Amundsen Coast, West Antarctica, with S. Das (PI, Woods Hole Oceanographic Institution), K. Frey (co-PI, Clark University), and M. J. Evans (co-PI, Wheaton College), \$96,904 to Wheaton.
- NSF: Geobiology & Low-Temperature Geochemistry (awarded 2009): \$257,000
Collaborative Research: Quantifying CO₂ fluxes along the Himalayan arc, with L. Derry (PI, Cornell University) and M. J. Evans (PI, Wheaton College), \$109,880 to Wheaton.
- Funds for Innovations with Academic Technology, Wheaton College (2012): \$8028
Faculty Course Transformation Grant, Wheaton College (2008): \$1500
- Faculty Summer Research Grant, The College of William & Mary (2006): \$5000
NSF (Hydrology), with Louis Derry, Cornell University (1999---2001): \$159,797
Geological Society of America Student Research Grant (1999): \$1500
Cornell University Biogeochemistry RTG Student Research Grants (1997, 1998, 1999, 2000)

PUBLICATIONS

- M. Osman, S. B. Das, O. Marchal, **M. J. Evans** (2017) *Methanesulfonic acid (MSA) migration in polar ice: Data synthesis and theory*, *The Cryosphere*, **11**, 2439-2462, doi: 10.5194/tc-11-2439-2017.
- A. S. Criscitiello S. Marshall, **M. J. Evans**, C. Kinnard, A. Norman, M. Sharp (2016) *Influence of tropical-Arctic teleconnections on ice core marine aerosol records from Prince of Wales Icefield, Ellesmere Island, Nunavut, Canada*, *Journal of Geophysical Research Atmospheres*, **121** (16), 9492-9507, doi: 10.1002/2015JD024457.
- D. Pasteris, J. R. McConnell, S. B. Das, A. S. Criscitiello, **M. Evans**, O. Maselli, M. Sigl, L. Layman (2014) *Seasonally resolved ice core records from West Antarctica indicate a sea ice source of sea salt aerosol and a biomass burning source of ammonium*, *Journal of Geophysical Research*, **119** (14), 9168–9182, doi: 10.1002/2013JD02072.
- A. S. Criscitiello, S. B. Das, K. B. Karnauskas, **M. J. Evans**, K. E. Frey, I. Joughin, E. J. Steig, J. R. McConnell, B. Medley (2013) *Tropical Pacific influence on source and transport of marine aerosols to West Antarctica*, *Journal of Climate*, **27**, 1343-1363, doi: 10.1175/JCLI-D-13-00148.1
- A. S. Criscitiello, S. B. Das, **M. J. Evans**, K. E. Frey, H. Conway, I. Joughin, B. Medley, E. J. Steig (2013), *Ice sheet record of recent polynya variability in the Amundsen Sea and Pine Island Bay, West Antarctica*, *Journal of Geophysical Research-Oceans*, **188**, 1-13, doi:10.1029/2012JC008077.
- L. A. Derry, **M. J. Evans**, R. Darling, C. France-Lanord (2009), *Hydrothermal heat flow near the Main*

Central Thrust, central Nepal Himalaya, Earth and Planetary Science Letters, **286**, 101–109.

M. J. Evans, L. A. Derry, C. France-Lanord (2008), *Degassing of metamorphic carbon dioxide from the Nepal Himalaya*, Geochemistry, Geophysics, Geosystems, **9** (4), 1–18, Q04021, doi:10.1029/2007GC001796.

*This paper was one of two featured articles in Science Magazine's *Perspectives*, 27 June 2008: vol. 320 #5884 1727---1728, highlighting particularly important and novel work.

K. Attoh, **M. J. Evans**, and M. E. Bickford (2006), *Geochemistry of an ultramafic---rodingite rock association in the Paleoproterozoic Dixcove greenstone belt, southwestern Ghana*, Journal of African Earth Sciences, **45** (3), 333–346.

M. J. Evans, L. A. Derry, C. France---Lanord (2004), *Geothermal fluxes of alkalinity in the Narayani river system of central Nepal*, Geochemistry, Geophysics, Geosystems, **5** (8), 1–21, Q08011, doi:10.1029/2004GC000719.

C. France-Lanord, **M. Evans**, J.E. Hurtrez, J. Riotte (2003), *Annual dissolved fluxes from Central Nepal rivers: budget of chemical erosion in the Himalayas*, Comptes Rendus Geoscience, **335** (16), 1131–1140.

J. Kim, R. Coish., **M. Evans**, G. Dick (2003), *Supra-subduction zone extensional magmatism in Vermont and adjacent Quebec: Implications for early Paleozoic Appalachian tectonics*, GSA Bulletin, **115** (12), 1552–1569.

M. J. Evans, L. A. Derry (2002), *Quartz control of high germanium---silicon ratios in geothermal waters*, Geology, **30** (11), 1019–1022.

M. J. Evans, L. A. Derry, S. P. Anderson and C. France-Lanord (2001), *A hydrothermal source of radiogenic Sr to Himalayan rivers*, Geology, **29** (9), 807–810.

SELECTED CONFERENCE PROCEEDINGS AND ABSTRACTS (*undergraduate student collaborator)

M. J. Evans, M. Kuhn*, E. Medeiros*, C. Petersen*, M. Sexton*, L. Thompson*, *Chemical Weathering and Hot Springs in the Bhutan Himalaya*, GSA Annual Meeting, Charlotte, NC, November 2012.

L. M. Thompson*, **M. J. Evans**, K. Frey, S. Das, *Glaciochemistry of a Shallow Ice Core from the West Antarctic Ice Sheet: Sources and Implications*, GSA Annual Meeting, Charlotte, NC, November 2012.

A. Criscitiello, S. Das, K. Karauskas, **M. Evans**, K. Frey, I. Joughin, E. Steig, J. McConnell, *Tropical Pacific influence on source and transport of marine aerosols to West Antarctica*, International Partnerships in Ice Core Sciences Open Science Conference, Presqu'île de Giens, France, October 2012.

Das, S.B. , I. Joughin, A.S. Criscitiello, B. Medley, H. Conway, **M. J. Evans**, K. E. Frey, J. McConnell, E. Steig, L. Trusel, *Ice core records of 20th century climate change along the Amundsen Sea Embayment, West Antarctica*, International Partnerships in Ice Core Sciences Open Science Conference, Presqu'île de Giens, France, October 2012.

M. J. Evans, C. Petersen*, *Chemical Weathering in the Eastern Himalaya: Geochemistry of Bhutanese Rivers*, AGU Fall Meeting, San Francisco, CA, December 2011.

A. S. Criscitiello, S. Das, **M. Evans**, K. Frey, I. Joughin, B. Medley, H. Conway, *Sea---ice behavior and biological productivity in the Amundsen Sea: New insight from West Antarctic Ice Sheet records*, AGU Fall Meeting, San Francisco, CA, December 2011.

C. Petersen*, **M. J. Evans**, *Geochemistry and Chemical Weathering Budgets for Himalayan Rivers of Bhutan*, NEGSA Annual Meeting, Pittsburgh, PA, March 2011. (Student Poster Award Winner).

- A. Criscitiello, S. Das, B. Medley, I. Joughin, H. Conway, **M. Evans**, K. Frey, Physical and chemical stratigraphy of snow pits on the West Antarctic Ice Sheet: Preliminary implications for sea-ice reconstruction. *2010 West Antarctic Ice Sheet Workshop*. Raystown, PA, 22–25 September 2010.
- M. J. Evans**, S. Beal*, *Weathering along a periglacial stream, West Greenland*. AGU Fall Meeting, San Francisco, CA, December 2009.
- S. Beal*, **M. J. Evans**, *Chemical Weathering along the Greenland Ice Sheet Margin*. NEGSA Annual meeting, Portland, ME, March 2009.
- M. J. Evans**, H. D. Packard*, *Impact of urbanization on sediment chemistry in small-scale watersheds, southeast Virginia*. AGU Fall meeting, San Francisco, CA, December 2007.
- H. D. Packard*, **M. J. Evans**, *Heavy metal concentrations in lacustrine sediments of developed and undeveloped watersheds, Williamsburg, VA*. GSA Annual Meeting, Philadelphia, PA, 2006.
- M. J. Evans**, L. A. Derry, C. France-Lanord, *Hydrothermal flux of metamorphic carbon dioxide from the central Nepal Himalaya*. AGU Fall meeting, San Francisco, CA, December 2005.
- M. J. Evans**, M. Fayek, L. Riciputi, L. Anovitz, S. Hull, F. J. Mathien, H. Milford, *LA-MC-ICPMS Determination of copper isotope ratios in turquoise from the Southwestern United States*. AGU Fall meeting, San Francisco, CA, December 2004.
- M. J. Evans**, S. Park, D. Bostick, L. Riciputi, D. Duckworth, *Improving U and Pu isotope analyses by HR-MC-ICPMS*. 5th International Conference on Magnetic Sector Field ICP-MS, August, 2004.
- M. J. Evans**, L. A. Derry, *Hydrothermal alkalinity in central Nepal rivers*. AGU Fall meeting, San Francisco, CA, December 2002.
- M. J. Evans**, L. A. Derry, *Ge/Si ratios as a tracer of hydrothermal activity in the Nepal Himalaya*. AGU Fall meeting, San Francisco, CA, December 2001.

STUDENTS ADVISED

Honor's Theses:

Lead committee member:

Sam Beal (2009) *"Chemical Weathering Along the Greenland Ice Sheet Margin"*

Aurelie Marcotte (2010) *"Determining Methanesulfonic Acid Levels in a Greenland Ice Core"*

Lauren Thompson (2012) *"Glaciochemistry of a Shallow Ice Core from the West Antarctic Ice Sheet: Sources and Implications"*

Matthew Sexton (2014) *"Behavior and Occurrence of Organic Acids in Antarctic Ice: Formic, Acetic, and Methanesulfonic Acid"*

McKenzie Kuhn (2015) *"Methane Dynamics in Vernal Pools"*

Madeline Hatch (2016) *"Sulfur Deposition on the Greenland Ice Sheet: Sources and Implications of MSA and Sulfate since 1900"*

Minor committee member: Jonathan Kay, Physics (2008), Julia Dekermendjian, Chemistry & Megan O'Sadnick , Physics (2009), Noemie Goff-Pochat, Physics, (2010), Mark Anderson, Political Science, (2012), Anne Bennet and Sara Moore, Biology (2014), Kristy Sullivan, Biology; Michelle Laverriere , Biology (2017).

Senior Independent Projects:

John Kay, Physics, 2008; Miriam Ledley, Environmental Science, 2009; James MacCarthy, Environmental Science, 2010; Claire Petersen, Physics, 2011, Karissa Vincent (2016)

Dissertation committee member, WHOI/MIT Joint Program Ph.D. student Ali Criscitiello

PROFESSIONAL AFFILIATIONS

Geochemical Society, Geological Society of America, American Geophysical Union

INSTRUMENT AND LAB EXPERIENCE

MC-ICP-MS (Finnigan Neptune): Developed and improved techniques for radiochemical and geological samples. Includes various sample throughput devices (desolvation and laser ablation).

ICP-MS (Finnigan ELEMENT II, VG Plasmaquad II+): Routine trace element analysis of waters, rocks, soils and sands; continuous and batch hydride generation for determination of germanium by isotope dilution; Pb isotopic analysis.

TIMS (VG Sector 54): Sr, Nd, and Pb isotopic analysis of waters, rocks, soils, sands; U---Pb analysis of zircons for dating.

Ion Chromatography (Dionex ICS 2000 and Dionex ICS---1000): Major elements in natural waters.

Stable Isotopes (VG---602D): Separation and analysis of H, O, and C isotopes waters and rocks, as well as H and C isotopic analysis of fluid inclusion fluids.

ICP-AES and AA: Routine major and trace element analyses of waters, rocks, soils and sands.

X-ray diffraction: Identification of alteration minerals in rocks and soils.

Class 1000 clean lab: Sample preparation including dissolution, bomb dissolution, exchange columns.

FIELD EXPERIENCE

Spring 2014, Ice core and snow pit samples, Greenland.

Spring 2012, River, hot spring, and sediment sampling, NW India.

Fall 2010: River, hot spring, and sediment sampling, Bhutan.

Fall 2009: Coring of sediments in impoundments, southeast MA.

Summer 2008: Water and sediment sampling, west coast Greenland.

Spring 2006: Coring of sediments in mill---ponds, Williamsburg, VA.

Spring 2001: Sampling hot spring and river waters as well as quartz and calcite veins for fluid inclusion studies, central Nepal.

Fall 1999: Collected hot spring and river waters and alteration minerals within lead---zinc mine in central Nepal and grasses and river waters in southern Nepal.

Summer 1998: Monsoon river water, soil, and plant sampling, central and southern Nepal.

Summer 1996: Field mapping in Colorado as teaching assistant for Cornell University's field course.

Fall 1994: Field mapping and sampling of metavolcanic rocks in northern Vermont.

Summer 1993: Field mapping in western Montana, Indiana University summer field course.

HONORS AND AWARDS

NASA Research Fellow, Cornell University (1999–2000)

John M. White Outstanding Geology Student Award, Middlebury College (1994) College Scholar, Middlebury College (1994)

Dean's List, Middlebury College (1991–1993)

COLLEGE AND DEPARTMENT SERVICE

Member, Committee on Committees and Agenda (2017-present)

Member, Sustainability Committee (2017-present)

Member Committee on Faculty Workload & Economic Status (2010–2012)

Member, Global Advisory Committee (2009–2011; 2017-present)

Member, Bhutan Working Group (2009–2011)

Untenured Faculty Organization (UFO) Steering Committee Natural Sciences

Divisional Liaison (2007–2009) Coordinator (2009–2010)

Coordinator (2012–2013)

Member Evaluation Subcommittee of the Education Policy Committee (2007–2009)

Member Provost Search Committee (2009)

Chemistry Department Search Committees (2007–2008; 2014–2015; 2015–2016, 2017)

Faculty presenter, WheaLead Program, 2016, 2017

Presented Faculty Luncheon Talk, Jan. 2008, Feb., 2012

Co-coordinated Science and Math Visiting Day, with Mike Gousie (2011) with Rachelle DeCoste (2012) and Jennifer Lanni (2014), Fall Visiting Day (2009)

Featured speaker, Alumni Event, Washington D.C. (2009), Portland, ME (2011) Faculty Lecture,

Facilitated, with Hyun Kim (Sociology), a 4---day teaching techniques workshop for ~14 faculty members at our new partner institution, the Royal Thimphu College (2009)

Panel Member Roosevelt Institution program “Policy not Politics: America’s Energy Future and the 2008 Election” (2008)