

LOUISA IRENE BRADTMILLER
Associate Professor of Environmental Studies
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I. EDUCATION

- 2008 - 2009 NOAA/UCAR Climate and Global Change Postdoctoral Scholar
Woods Hole Oceanographic Institution, Woods Hole, MA, USA
- 2008 Columbia University, New York, NY, USA
Ph.D. Geochemistry
Research Advisor: Robert F. Anderson
Thesis: Testing the Silicic Acid Leakage Hypothesis: Records of opal burial from the equatorial Atlantic, equatorial Pacific and Southern Oceans over the past 30ka
- 2006 Columbia University, New York, NY, USA
M.Phil. Geochemistry
- 2005 Columbia University, New York, NY, USA
M.A. Geochemistry
- 1998 - 2002 Smith College, Northampton, MA, USA
B.A. Geology, with High Honors
Magna Cum Laude

II. EMPLOYMENT

- 2015 - present Associate Professor, Department of Environmental Studies, Macalester College, Saint Paul, MN
- 2009 - 2015 Assistant Professor, Department of Environmental Studies, Macalester College, Saint Paul, MN
- 2002 - 2003 Laboratory assistant, Department of Earth, Atmospheric and Planetary Sciences, Massachusetts Institute of Technology, Cambridge, MA

III. RESEARCH INTERESTS

- 2009-present Paleoceanography: use of biological productivity proxies to reconstruct changes in nutrient supply and upwelling on the northwest African margin since the last deglaciation. Terrestrial paleoclimate: reconstruction of climate and erosion in the northern Rocky Mountain region since the last deglaciation using lake sediments.
- 2008 - 2009 Postdoctoral research: Use of uranium-series systems to investigate problems in paleo- and chemical oceanography, including meridional overturning strength during Heinrich Event 1 and the distribution of radionuclides in the modern ocean.
- 2003 - 2008 Dissertation research: Examining paleoproductivity changes in the equatorial and southern oceans during the last glacial maximum and their possible linkage to glacial-interglacial changes in atmospheric CO₂.

IV. PUBLICATIONS IN PEER-REVIEWED JOURNALS

Albani, S., N. M. Mahowald, L. N. Murphy, R. Raiswell, J. K. Moore, R. F. Anderson, D. McGee, L. I. Bradtmiller, B. Delmonte, P. P. Hesse, and P. A. Mayewski (2016). Paleodust variability since the Last

- Glacial Maximum and implications for iron inputs to the ocean, *Geophysical Research Letters*, 43, doi:10.1002/2016GL067911.
- Struve, T., T. van de Flierdt, L. F. Robinson, L. I. Bradtmiller, S. K. Hines, J. F. Adkins, M. Lambelet, K. C. Crocket, K. Kreissig, B. Coles and M. E. Auro (2016). Neodymium isotope analyses after combined extraction of actinide and lanthanide elements from seawater and deep-sea coral aragonite. *Geochemistry, Geophysics, Geosystems*, Vol. 17, Iss. 1, doi:10.1002/2015GC006130.
- Bradtmiller, L.I., D. McGee, P.B. DeMenocal, C.W. Kinsley, M. Awalt*, J. Evers* and H. Yerxa* (2016). Changes in biological productivity along the northwest African Margin over the past 20,000 years. *Paleoceanography*, 31, doi:10.1002/2015PA002862.
- Schachtman, N.S.*, K.R. MacGregor, A. Myrbo, N.R. Hencir*, C.A. Riihimaki, J. Thole and L.I. Bradtmiller (2015). Lake core record of Grinnell Glacier dynamics during the Late Pleistocene and Younger Dryas, Glacier National Park, Montana, USA. *Quaternary Research*, 84, doi:10.1016/j.yqres.2015.05.004.
- Albani, S., N.M. Mahowald, G. Winckler, R.F. Anderson, L.I. Bradtmiller, B. Delmonte, R. François, M. Goman, N.G. Heavens, P.P. Hesse, S.A. Hovan, S.G. Kang, K.E. Kohfeld, H. Lu, V. Maggi, J.A. Mason, P.A. Mayewski, D. McGee, X. Miao, B.L. Otto-Bliesner, A.T. Perry, A. Pourmand, H.M. Roberts, N. Rosenbloom, T. Stevens, and J. Sun (2015). Twelve thousand years of dust: the Holocene global dust cycle constrained by natural archives. *Climate of the Past*, 11, 869-903, doi:10.5194/cp-11-869-2015.
- Bradtmiller, L.I., J.F. McManus and L.F. Robinson (2014). $^{231}\text{Pa}/^{230}\text{Th}$ evidence for persistent Atlantic overturning circulation during Heinrich Event 1. *Nature Communications*, 5, 5817, doi:10.1038/ncomms6817.
- Arbuszewski, J.A., P.B. deMenocal, C. Cleroux, L. Bradtmiller and A. Mix (2013). Meridional shifts of the Atlantic intertropical convergence zone since the Last Glacial Maximum. *Nature Geoscience*, 6, 959-962, doi:10.1038/ngeo1961.
- McGee, D., P.B. deMenocal, G. Winckler, J.B. Stuut and L.I. Bradtmiller (2013). The magnitude, timing and abruptness of changes in North African dust deposition over the last 20,000 years. *Earth and Planetary Science Letters*, 371-372, 163-176, doi: 10.1016/j.epsl.2013.03.054.
- Auro, M., L.F. Robinson, A. Burke, L.I. Bradtmiller, M.Q. Fleisher, R.F. Anderson (2012). Intercal: Improvements to 232-thorium, 230-thorium and 231-protactinium analysis in seawater arising from GEOTRACES Intercalibration. *Limnology and Oceanography: Methods*, 10:464-474, doi: 10.4319/lom.2012.10.464.
- Burke, A., O. Marchal, L. Bradtmiller, J. McManus, R. Francois (2011). Application of an inverse method to interpret $^{231}\text{Pa}/^{230}\text{Th}$ observations from marine sediments. *Paleoceanography*, 26, PA1212, doi:10.1029/2010PA002022.
- Bradtmiller, L.I., R.F. Anderson, J.P. Sachs, M.Q. Fleisher (2010). A deeper respired carbon pool in the glacial equatorial Pacific Ocean. *Earth and Planetary Science Letters*, 299, 417-425, doi: 10.1016/j.epsl.2010.09.022.
- Anderson, R.F., S. Ali, L. I. Bradtmiller, S. H. H. Nielsen, M. Q. Fleisher, B. E. Anderson, L. H. Burckle (2009). Wind-Driven Upwelling in the Southern Ocean and the Deglacial Rise in Atmospheric CO₂. *Science*, Vol. 323, Iss. 5920.
- Bradtmiller, L.I., R. F. Anderson, M.Q. Fleisher and L. H. Burckle (2009). Comparing glacial and Holocene opal fluxes in the Pacific sector of the Southern Ocean. *Paleoceanography*, 24, PA2214, doi:10.1029/2008PA001693.

Siddall, M., R. F. Anderson, G. Winckler, G. M. Henderson, L. I. Bradtmiller, D. McGee, A. Franzese, T. F. Stocker, and S. A. Müller (2008). Modeling the particle flux effect on distribution of ^{230}Th in the equatorial Pacific. *Paleoceanography*, 23, PA2208, doi:10.1029/2007PA001556.

Bradtmiller, L.I., R. F. Anderson, M.Q. Fleisher and L. H. Burckle (2007). Opal burial in the equatorial Atlantic Ocean over the last 30kyr: implications for glacial-interglacial changes in the ocean silicon cycle. *Paleoceanography*, 22, PA4216, doi:10.1029/2007PA001443.

Francois, R., M. Frank, M. Rutgers van der Loeff, M.P. Bacon, W. Geibert, S. Kienast, R.F. Anderson, L. Bradtmiller, Z. Chase, G. Henderson, F. Marcantonio and S.E. Allen (2007). Comment on “Do geochemical estimates of sediment focusing pass the sediment test in the equatorial Pacific?” by M. Lyle et al., *Paleoceanography*, 22, PA1216, doi:10.1029/2005PA001235.

Loubere, P., S. Seidlecki, and L. I. Bradtmiller (2007). Organic carbon and carbonate fluxes: Links to climate change, *Deep Sea Research II*, DSR2023, doi: 10.1016/j.dsr2.2007.02.001.

Bradtmiller, L. I., R. F. Anderson, M. Q. Fleisher and L. H. Burckle (2006). Diatom productivity in the equatorial Pacific Ocean from the last glacial period to the present: A test of the silicic acid leakage hypothesis, *Paleoceanography*, 21, PA4201, doi:10.1029/2006PA001282.

V. SCHOLARLY WORK UNDER SUBMISSION

VI. PRESENTATIONS

Conference Abstracts

- 2014 American Geophysical Union Fall Meeting, San Francisco, CA, USA
Changes in opal fluxes along the northwest African margin during the last glacial period; linking high and low latitude patterns of productivity (Oral presentation)
Bradtmiller, L.I., M. Galgay*, D. McGee, C.W. Kinsley, R.F. Anderson
- 2014 American Geophysical Union Fall Meeting, San Francisco, CA, USA
North African dust deposition and hydroclimate over the last 60 ka: A combined view from the east and west of the continent
Kinsley, C.W., D. McGee, L.I. Bradtmiller, J. Tierney, G. Winckler, J.-B. Stuut, P.B. deMenocal.
- 2013 American Geophysical Union Fall Meeting, San Francisco, CA, USA
Changes in North African dust deposition: 35 ka through the Last Glacial Maximum
Kinsley, C.W., D. McGee, G. Winckler, P.B. deMenocal, J.-B. Stuut, L.I. Bradtmiller
- 2013 International Conference on Paleoceanography, Barcelona, Spain
Changes in opal and eolian dust fluxes along the northwest African margin during the last glacial period
Bradtmiller, L.I., D. McGee, P.B. deMenocal, C.W. Kinsley, M. Galgay*
- 2012 American Geophysical Union Fall Meeting, San Francisco, CA, USA
Using opal and organic carbon in marine sediments to assess changes in upwelling during the African Humid Period
Bradtmiller, L.I., J. Evers*, H. Yerxa*, D. McGee and P.B. deMenocal
- 2012 American Geophysical Union Fall Meeting, San Francisco, CA, USA
The magnitude, timing and abruptness of changes in North African dust deposition over the last 20,000 years: Insights into regional atmospheric circulation and dust-

related climate impacts

McGee, D., P.B. deMenocal, G. Winckler, J.W. Stuut, L.I. Bradtmiller, N.M. Mahowald and S. Albani

- 2012 American Geophysical Union Fall Meeting, San Francisco, CA, USA
Session Co-convenor: Tropical Hydrology and the Hadley Circulation in Past Climates
- 2012 Goldschmidt Conference, Montreal, Canada
Reconstructing the large-scale deep and intermediate ocean circulation in the North Atlantic during the LGM and last deglaciation
McManus, J.F., S. Hoffmann, N. Roberts, G. Henry, L.I. Bradtmiller, K. Mohamed, S. Jaccard, J. Yu, A. Piotrowski, D.W. Oppo, S. Praetorius, and L.F. Robinson
- 2011 American Geophysical Union Fall Meeting, San Francisco, CA, USA
Using opal and organic carbon as proxies for trade wind strength during the African Humid Period
Awalt, M.B.*, L.I. Bradtmiller, D. McGee, and P.E. DeMenocal
- 2011 Geological Society of America Annual Meeting, Minneapolis, MN, USA
Undergraduate lacustrine research focusing on environmental change at Glacier National Park, Montana
Riihimaki, C.A., K.R. MacGregor, A. Myrbo, L.I. Bradtmiller, K. Brady, P. Oddo and J. Griffin
- 2011 Geological Society of America Annual Meeting, Minneapolis, MN, USA
Vegetation history of the late Holocene in East Glacier National Park, Montana: a paleoenvironmental study
Locatelli, E.*, L.I. Bradtmiller, A. Myrbo, K.R. MacGregor, J. Kutvirt*, C.A. Riihimaki and K. Brady
- 2011 Geological Society of America Annual Meeting, Minneapolis, MN, USA
A record of Minnesota settlement history from River Lake
Hart, K.* and L.I. Bradtmiller
- 2011 Goldschmidt Conference, Prague, Czech Republic
Using opal and organic carbon as proxies for migration of the North African Monsoon (Oral presentation)
Bradtmiller, L.I., M.B. Awalt*, D. McGee, and P.E. DeMenocal
- 2010 American Geophysical Union, Fall Meeting, San Francisco, CA, USA
Evolution of tropical Atlantic SST Gradients since the LGM and associated shifts of the marine Atlantic ITCZ
Arbuszewski, J.A., P.B. deMenocal, C. Cleroux, L.I. Bradtmiller, A. Mix
- 2010 Geological Society of America Annual Meeting, Denver, CO, USA
Geomorphologic and Environmental Change in the Many Glacier Region, Glacier National Park, MT
MacGregor, K., C. Riihimaki, A. Myrbo, K. Brady, L.I. Bradtmiller, H. Bourne, J. Griffith, J. Kutvirt*, E. Locatelli*, S. Matteson, P. Oddo, C. Simcoe
- 2010 Goldschmidt Conference, Knoxville, TN, USA

- Geochemical, isotopic and physical evidence for vigorous meridional overturning circulation at mid-depth in the Atlantic Ocean at the LGM
McManus, J.F., C.O. Major, K.J. Mohamed, L.F. Robinson, D.W. Oppo, W.B. Curry, J.M. Yu, L.I. Bradtmiller, S.L. Jaccard
- 2009 American Geophysical Union, Fall Meeting, San Francisco, CA, USA
Support for a deeper glacial oceanic respired carbon pool from the Equatorial Pacific (Oral presentation)
Bradtmiller, L. I., R. F. Anderson, M. Q. Fleisher
- 2009 American Geophysical Union, Fall Meeting, San Francisco, CA, USA
Session Co-convenor: Paleooceanographic Applications of Biogenic Opal: Proxies in a Silica World
- 2009 Goldschmidt Conference, Davos, Switzerland
The distribution of ^{231}Pa and ^{230}Th in paired water column and surface sediment samples (Oral presentation)
Bradtmiller, L. I., L. F. Robinson, J. F. McManus, M. E. Auro, H. C. Bostock
- 2009 GEOTRACES data/modeling synergy workshop
Application of an Inverse Method to Interpret $^{231}\text{Pa}/^{230}\text{Th}$ Observations from Marine Sediments
Burke, A., O. Marchal, L.I. Bradtmiller, J.F. McManus, R. François
- 2008 American Geophysical Union, Fall Meeting, San Francisco, CA, USA
Applying the spatial mapping approach to $^{231}\text{Pa}/^{230}\text{Th}$ as an overturning proxy (Oral presentation)
Bradtmiller, L. I., J. F. McManus, L. F. Robinson
- 2008 American Geophysical Union, Fall Meeting, San Francisco, CA, USA
Wind-Driven Upwelling in the Southern Ocean and the Deglacial Rise of Atmospheric CO_2
Anderson, R. F., S. Ali, L. I. Bradtmiller, M. Q. Fleisher, L. H. Burckle
- 2008 Dissertations Symposium on Chemical Oceanography, Honolulu, HI, USA
Testing the Silicic Acid Leakage Hypothesis: What opal burial can tell us (or not) about glacial pCO_2 (Invited oral presentation)
Bradtmiller, L. I., R. F. Anderson, M. Q. Fleisher, L. H. Burckle
- 2007 American Geophysical Union, Fall Meeting, San Francisco, CA, USA
Opal burial in the Pacific Southern Ocean since the LGM: Implications for ocean circulation and nutrient cycles
Bradtmiller, L.I., R. F. Anderson, M. Q. Fleisher, L. H. Burckle
- 2007 International Conference on Paleoceanography, Shanghai, China
Opal burial in the equatorial Atlantic and Pacific Oceans: implications for glacial-interglacial silica distribution (Invited oral presentation)
Bradtmiller, L.I., R. F. Anderson, M. Q. Fleisher, L. H. Burckle
- 2006 American Geophysical Union, Fall Meeting, San Francisco, CA, USA
Equatorial Atlantic opal and $^{231}\text{Pa}/^{230}\text{Th}$ records over the last 30 kyr (Oral presentation)

Bradtmiller, L.I., R. F. Anderson, M. Q. Fleisher, L. H. Burckle

- 2005 Comer Abrupt Climate Change Fellowship Conference, Palisades, NY, USA
Opal Burial in the Equatorial Pacific: Testing the Silicic Acid Leakage Hypothesis
Bradtmiller L. I., R. F. Anderson, M. Q. Fleisher
- 2005 American Geophysical Union, Fall Meeting, San Francisco, CA, USA
Uranium Series Diagenesis in Corals Exposed to Fresh Water: Toward Better
Prospecting for Closed System Samples for High Accuracy Dating
Mey, J. L., R. G. Fairbanks, R. Mortlock, L. Bradtmiller
- 2005 American Geophysical Union, Chapman Conference: Role of Marine Organic
Carbon and Calcite Fluxes in Driving Global Climate Change, Woods Hole, MA
Deep Pacific CaCO₃ Compensation and Glacial-Interglacial Atmospheric CO₂
Marchitto, T. M., J. Lynch-Stieglitz, S. Hemming, L. I. Bradtmiller
- 2005 American Geophysical Union, Spring Meeting
Deglacial breakdown of ocean stratification - Evidence from the Ocean's Si Cycle.
Anderson, R. F., S. Ali, L. I. Bradtmiller, M. Q. Fleisher, C. Giulivi.
- 2005 American Geophysical Union, Chapman Conference: Role of Marine Organic
Carbon and Calcite Fluxes in Driving Global Climate Change, Woods Hole, MA
A test of the Silicic Acid Leakage Hypothesis
Anderson, R. F., L. I. Bradtmiller, M. Q. Fleisher
- 2005 American Geophysical Union Chapman Conference: Role of Marine Organic
Carbon and Calcite Fluxes in Driving Global Climate Change, Woods Hole, MA
Opal Burial in Equatorial Pacific Sediments: A Test of the Silicic Acid Leakage
Hypothesis
Bradtmiller, L. I., R. F. Anderson, M. Q. Fleisher
- 2004 American Geophysical Union, Fall Meeting, San Francisco, CA, USA
Testing the Silicic Acid Leakage Hypothesis: A Paleoproductivity Reconstruction in
the Eastern Equatorial Pacific from the Last Glacial Maximum to the Present (Oral
presentation)
Bradtmiller, L. I., R. F. Anderson, M. Q. Fleisher, A. Koutavas
- 2002 Keck Geology Consortium Conference, Amherst, MA, USA
Geochemistry of Laurentide Glacial Sediment from Southwestern Ohio and
Implications for Climate Change
Bradtmiller, L. I.

* denotes Macalester College undergraduate co-author. Oral presentations are noted; all other abstracts indicate poster presentations or oral presentations by co-authors.

Invited Lectures

- 2014 University of Minnesota Quaternary Paleoecology Seminar
2014 Carleton College Chemistry Department, Dept. Seminar
2012 *Beaker and Brush* series, Science Museum of Minnesota
2012 Iowa State Department of Geological and Atmospheric Sciences, Dept. Seminar
2011 Macalester College Alumni Club, Seattle Chapter
2010 Macalester College Alumni College

2009	University of Minnesota Department of Geology and Geophysics, Dept. Seminar
2009	Concordia University, Environmental Chemistry course
2008	Dissertations Symposium in Chemical Oceanography
2008	Woods Hole Oceanographic Institution, Paleo-lunch seminar
2007	Hofstra University, Paleoclimatology course
2007	International Conference on Paleoceanography
2004-2006	LDEO Summer Intern Lecture Series

VII. AWARDS, RECOGNITION AND GRANTS

Professional Awards and Recognition

2008	NOAA Climate and Global Change Postdoctoral Fellowship
2008	Woods Hole Oceanographic Institution Postdoctoral Fellowship
2006	AGU Outstanding Student Paper Award
2006	Goodfriend Prize (Lamont Doherty Earth Observatory)
2004 - 2006	Abrupt Climate Change Fellow (Comer Science and Education Foundation)
2004	Sara F. Langer Prize (Lamont Doherty Earth Observatory)

Grants Received (External)

2014	InTeGrate curriculum development grant (sub-award of NSF award DUE-1125331) to co-develop the course Modeling Earth Systems. \$15,000
2011	NSF award OCE-1103262 RUI: Using opal and organic carbon as proxies for wind-driven upwelling during the onset and termination of the African Humid Period in a transect of African margin cores. \$137,829

Grants Received (Internal)

2016	Wallace Scholarly Activities Grant, Macalester College (\$2,000)
2011	Student Faculty Summer Research Grant, Macalester College (\$4,000)
2010	Student Faculty Summer Research Grant, Macalester College (\$4,030)
2010	Wallace Scholarly Activities Grant, Macalester College (\$2,160)
2006	Climate Center Grant, Lamont Doherty Earth Observatory (\$6,000)

Undergraduate Awards and Honors

1999 - 2002	Smith College Dean's List
1998	Smith College STRIDE Scholar
1998	National Merit Finalist

VIII. SERVICE

Membership in professional societies

2003 - present	American Geophysical Union
2012 - present	Geological Society of America
2002 - present	Phi Beta Kappa
2002 - present	Sigma Xi

Professional Service

Associate Editor: *Quaternary Research* (2015-present)

Peer Reviewer: *Climate of the Past*
Earth and Planetary Science Letters
Geochemistry, Geophysics, Geosystems (G-Cubed)
Geology
Global Biogeochemical Cycles
Limnology and Oceanography

Nature Communications

Nature Geoscience

Paleoceanography

Quaternary Science Reviews

NSF Geosciences Division (Ocean Sciences- Chemical Oceanography) and

Antarctic Earth Science/Office of Polar Programs

NOAA Earth Systems Science Program (Global Carbon Cycle)

Participant: Climate Science Day on Capitol Hill (2012)
Expert Witness Training Academy (2013) (co-sponsored by NSF and William Mitchell College of Law)

Community service

2009 - 2010 E-mentor at the Great Rivers School and Arlington High School (Saint Paul, MN) through the non-profit group Eco Education.

2006 - 2008 Graduate Teaching Fellow, The Young Women's Leadership School (East Harlem Campus). This program pairs New York City high school teachers with Columbia University researchers. Responsibilities included preparing age and content-appropriate sessions, leading classes one day per month, and in this case serving as a positive role model to students at an all-female high school. Activities also included field trips to Central Park and Inwood Hill Park with the 10th grade (approx. 70 students).

2006 - 2008 Member of the Web Advisory Committee for LDEO. The committee assists and provides oversight for the webmaster and web team.

2004 - 2006 Co-chair of the Graduate Student Council for LDEO, GISS and AMNH. Responsibilities included managing the budget, organizing and funding student activities, serving as a liaison with the faculty, and addressing general student needs and concerns.

2004 - 2008 Volunteer site leader, Hudson River Snapshot Day. This project (through the Hudson River Estuary Program) helps high school students collect chemical and biological data all along the Hudson river. Responsibilities included providing context and background information, and supervising measurements.

Macalester College service

2015 – present President, Phi Beta Kappa, Epsilon Chapter of MN at Macalester College

2015 – present Faculty Co-adviser, Women in Math and Science

2015 Task force on transgender student participation in athletics

2014 – 2015 Library and Media Services Advisory Committee

2012 MacReads book selection committee

2011 – 2012 Secretary of the Faculty

2010 – present International Center Liaison, Department of Environmental Studies

2010 Invited speaker at Alumni College 2010

2010 Macalester Fulbright Scholarship review committee