Jennifer Lynne Middleton

Lamont-Doherty Earth Observatory
61 Route 9W
Palisades, NY 10964 USA

jennym[at]ldeo.columbia.edu
office: (845) 365-8481

EDUCATION

Ph.D., Earth & Planetary Sciences, Harvard University, Cambridge, MA, 2017
Advisors: Sujoy Mukhopadhyay (U. California Davis) and Charles Langmuir
M.A. Earth & Planetary Sciences, Harvard University, Cambridge, MA, 2013
B.A. Earth & Planetary Sciences cum laude, Harvard University, Cambridge, MA, 2010

RESEARCH EXPERIENCE

Postdoctoral Fellow, Lamont-Doherty Earth Observatory, Palisades NY, 2017- present
Graduate Research Assistant, Harvard University, Cambridge MA, 2011-2017
Research Assistant, Harvard Noble Gas Lab, Cambridge, MA, 2008-2010
Research Assistant, Harvard Environmental Chemistry Group, Cambridge, MA, 2007

RESEARCH INTERESTS

Isotope geochemistry, paleoclimate, and paleoceanography. Atmosphere, ocean, carbon cycle, and solid Earth interactions across climatic change. Continental dust emissions, nutrient delivery to marine ecosystems and carbon export. Interactions between ice age cycles and submarine volcanism. Cosmogenic exposure dating and ice sheet stability. Technique development in noble gas geochemistry.

HONORS AND AWARDS

Lamont Climate Center Grant, 2019
Lamont Postdoctoral Fellowship, 2017- present
Harvard University Certificate of Distinction in Teaching, 2013, 2014
Shaler Teaching Award, Harvard Department of Earth & Planetary Sciences, 2013
National Science Foundation Graduate Research Fellowship, 2013-2016
Smith Family Graduate Science and Engineering Fellowship, 2012
Harvard University Center for the Environment: Graduate Consortium Fellowship, 2012
Harvard Undergraduate Research Program, 2009
Herschel Smith Summer Undergraduate Research Fellow, 2007

ACTIVITES AND TEACHING

Guest Lecturer, Columbia, *EESCGU-4235: Sea Level Change*, Spring 2019
Guest Lecturer, University of California Davis, *Geology 1: The Earth*, Spring 2016
Guest Lecturer, Tufts University *Chem/Bio/Astro6: Big Bang to Humankind*, Spring 2014
Head Teaching Fellow, Harvard, *SPU14: How to Build a Habitable Planet*, Fall 2013
Teaching Fellow, Harvard, *SPU14: How to Build a Habitable Planet*, Fall 2012
Graduate Consortium on Energy and the Environment, Harvard University Center for the Environment, 2012- 2014

MENTORING

Mentoring of Junior Scientists

Kelly Powell – Undergrad. Research Assistant (Lamont), 2019- present
John Richardson – Undergrad. Research Assistant (Lamont), 2018-2019
Marcelle D'Almeida – Undergrad. Research Assistant (UC Davis), 2016-2017
Alec Tyra – Undergrad. Research Assistant (UC Davis), 2016
Francisco Apen – Junior Research Specialist (UC Davis), 2015-2017
Ariana Saxby – Undergrad. Research Assistant (Harvard), 2013-2014

DIVERSITY AND INCLUSION

Lamont-Doherty Professional Conduct Committee 2018- present
Co-organizer of LDEO Gender and Diversity Coffee Hour 2019

PROFESSIONAL MEMBERSHIPS

American Geophysical Union
Geochemical Society

SEAGOING AND FIELD EXPERIENCE

Stratigraphic Correlator, IODP Exp. 383, R/V Joides Resolution, Southern Ocean, 2019
Graduate Field Assistant, Ohio Range, Antarctica, 2015-2016
Sediment Geochemist, R/V Atlantis, Juan de Fuca Ridge, 2014
Sediment Geochemist, R/V Knorr, Mid-Atlantic Ridge, 2012
Field Assistant, McMurdo Dry Valleys, Antarctica, 2008-2009
Student, Juneau Icefield Research Program, Juneau Icefield, AK, 2008

INVITED SEMINARS

University of Delaware, Departmental Seminar, 2019
American Museum of Natural History, Departmental Seminar, 2019
Alfred Wegener Institute, Geoseminar, 2018
University of Cambridge, Isotope Coffee, 2017
University of California Berkeley, Isotope Geochemistry Seminar, 2017
Woods Hole Oceanographic Institution, MG&G Seminar, 2017
Lamont-Doherty Earth Observatory, Geochemistry Seminar, 2015

EXTERNAL GRANTS

Establishing extraterrestrial ^{3}He as a Plio-Pleistocene constant flux proxy, 2019-2022
Middleton, J.L. (P.I.) and G. Winckler (Co-P.I.)
NSF Marine Geology and Geophysics, $477,004

PUBLICATIONS

[0] Costa, K.M., Hayes, C.M., Anderson, R.F., Pavia, F.K, Bausch, A., Deng, Feifei, Dutay, J.-C., Geibert, W., Heinze, C., Henderson, G., Hillaire-Marcel, C., Hoffman, S., Jaccard, S.L., Jacobel, A.W., Kienast, S.S., Kipp, L., Lerner, P.,

Lippold, J., Lund, D., Marcantonio, F., McGee., D., McManus, J.F., Mekik, F., **Middleton, J.L.**, Missiaen, L., Not, C., Pichat, S., Robinson, L.F., Rowland, G.H., Roy-Barman, M., Tagliabue, A., Torfstein, A., Winckler, G., and Zhou, Y. 230^{Th} normalization: New insights on an essential tool for quantifying sedimentary fluxes in the modern and Quaternary ocean. *(in press for Paleoceanography and Paleoclimatology)*

[1] **Middleton, J.L.,** S. Mukhopadhyay, K.M. Costa, F.J. Pavia, G. Winckler, J.F. McManus, M. D'Almeida, C.H. Langmuir, and P.J. Huybers. The spatial footprint of hydrothermal scavenging on $^{230}Th_{XS}$-derived mass accumulation rates. *Geochimica et Cosmochimica Acta*, 272, 218-234, 2020.

[2] Jacobel, A.W., R.F. Anderson, G. Winckler, K.M. Costa, J. Gottschalk, **J.L. Middleton**, F.J. Pavia, E.M. Schoenfelt, and Y. Zhou. No evidence for equatorial Pacific dust fertilization. *Nature Geoscience,* 12, 154, 2019.

[3] Costa, K.M., R.F. Anderson, J.F. McManus, G. Winckler, **J.L. Middleton**, and C.H. Langmuir. Trace element (Mn, Zn, Ni, V) and authigenic uranium (aU) geochemistry reveal sedimentary redox history on the Juan de Fuca Ridge, North Pacific Ocean. *Geochimica et Cosmochimica Acta*, 236, 79-98, 2018.

[4] **Middleton, J.L**., S. Mukhopadhyay, C.H. Langmuir, J.F. McManus, and P.J. Huybers. Millennial-scale variations in dustiness recorded in Mid-Atlantic sediments from 0 to 70 ka. *Earth and Planetary Science Letters,* 482, 12-22, 2018.

[5] Costa, K.M., J.F. McManus, **J.L. Middleton**, C.H. Langmuir, P.J. Huybers, G. Winckler, and S. Mukhopadhyay. Hydrothermal deposition on the Juan de Fuca Ridge over multiple glacial-interglacial cycles. *Earth and Planetary Science Letters*, 479, 120-132, 2017.

[6] **Middleton, J.L.,** C.H. Langmuir, S. Mukhopadhyay, J.F. McManus, and J.X. Mitrovica. Hydrothermal iron flux variability following rapid sea-level changes. *Geophysical Research Letters*, 43, doi:10.1002/2016GL068408. 2016.

[7] **Middleton, J.L.,** R.P. Ackert, and S. Mukhopadhyay. Pothole and channel system formation in the McMurdo Dry Valleys of Antarctica: New insights from cosmogenic nuclides. *Earth and Planetary Science Letters*, 355-356, 341-350, 2012.

MANUSCRIPTS IN PROGRESS

[A] **Middleton, J.L.,** S. Mukhopadhyay, C.H. Langmuir, K.M. Costa, J.F. McManus, R.F. Katz, P.J. Huybers, G. Winckler, and Y Li. The statistical relationship between sea level variability and hydrothermal activity on the Juan de Fuca Ridge. *(in preparation)*

SELECTED CONFERENCE PROCEEDINGS

[1] **Middleton, J.L.,** S. Mukhopadhyay, K. Costa, F. Pavia, G. Winckler, J.F. McManus, M. D'Almeida, C.H. Langmuir, and P.J. Huybers. How much does hydrothermal scavenging influence thorium-derived sediment fluxes? American Geophysical Union Fall Meeting, 2019.

[2] **Middleton, J.L.,** Z. Mason, S. Mukhopadhyay, A.E. Putnam, R.P. Ackert, and S.W. Campbell. Cosmogenic nuclides suggest long-term Pleistocene exposure of subglacial bedrock at the Ohio Range in the West Antarctic Ice Sheet. American Geophysical Union Fall Meeting, 2018.

[3] **Middleton, J.L.,** G. Winckler, and F. Lamy. Pleistocene climate variability and iron fertilization in the Pacific Southern Ocean. Comer Climate Conference, 2018.

[4] **Middleton, J.L.,** S. Mukhopadhyay, C.H. Langmuir, J.F. McManus, K.M. Costa, P.J. Huybers, and G. Winckler. Aeolian and hydrothermal iron inputs to the subtropical Mid-Atlantic over the last glacial period. DICE workshop: The Role of Dust in Climate Change, 2018.

[5] **Middleton, J.L.**, S. Mukhopadhyay, C.H. Langmuir, K.M. Costa, J.F. McManus, R.F. Katz, P.J. Huybers, G. Winckler, and Y. Li. 600 kyr of hydrothermal activity on the Cleft Segment of the Juan de Fuca Ridge. American Geophysical Union Fall Meeting, 2017.

[6] Costa, K.M., J.F. McManus, G. Winckler, R.F. Anderson, **J.L. Middleton**, and S. Mukhopadhyay. Tracking dust deposition around the North Pacific Gyre over the past 500 kyr. American Geophysical Union Fall Meeting, 2017.

[7] Austermann, J., L. Carter, **J. Middleton.**, L. Pyle, and J. Stellmann. Tectonic reorganization and the cause of Paleocene and Eocene pCO2 anomalies. European Geophysical Union General Assembly, 2017.

[8] **Middleton, J.L.**, S. Mukhopadhyay, C. Langmuir, K. Costa, J. McManus, M. D'Almeida, P. Huybers, and G. Winckler. Constant flux proxies and Pleistocene sediment accumulation rates on the Juan de Fuca Ridge in the Northeast Pacific. American Geophysical Union Fall Meeting, 2016.

[9] **Middleton, J.L.**, S. Mukhopadhyay, C.H. Langmuir, J.F. McManus, and P.J. Huybers. 70 ka of dust deposition in the subtropical Mid-Atlantic. Goldschmidt, 2016.

[10] **Middleton, J.L.**, S. Mukhopadhyay, J.F. McManus, and C.H. Langmuir. Last Glacial Maximum and hydrothermal sediment fluxes on the Mid-Atlantic Ridge. Goldschmidt, 2015.

[11] **Middleton, J.L.**, S. Mukhopadhyay, J.F. McManus, and C.H. Langmuir. Last Glacial Maximum and hydrothermal sediment fluxes on the Mid-Atlantic Ridge. Deep Carbon Observatory Thematic Institute, 2015.

[12] **Middleton, J.L.**, R.P. Ackert, and S. Mukhopadhyay. The Not-so-Dry Valleys?: Cosmogenic Nuclides and Complex Exposure in the Dry Valleys of Antarctica. American Geophysical Union Fall Meeting, 2011.