

CATHLEEN L. DOHERTY (NÉE DALE)

Director of Inorganic Analysis Facility | Science Educator

Environmental and Occupation Health Sciences Institute

Rutgers, The State University of New Jersey

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EDUCATION

- 2016 **Ph. D. Columbia University**, Geochemistry, Department of Earth and Environmental Sciences, Lamont-Doherty Earth Observatory, “*Multi-stage evolution of the lithospheric mantle in the West Antarctic Rift System – a mantle xenolith study*” (Dr. Cornelia Class, advisor)
- 2015 **M.Phil. Columbia University**, Department of Earth and Environmental Sciences, Lamont-Doherty Earth Observatory (Dr. Cornelia Class, advisor)
- 2009 **M.S. Montclair State University**, Geoscience, Department of Earth and Environmental Studies, “*Geochemical and petrographic signatures from Marie Byrd Land and Larsen-B Ice Shelf: Implications for provenance tracing*” (Dr. Stefanie Brachfeld, advisor)
- 2007 **B.S. Montclair State University**, Biology (Honors), Department of Biology; *Minors: Geoscience & Chemistry*

PROFESSIONAL EXPERIENCE

TEACHING APPOINTMENTS

- 2023 - Faculty, Citizen Science Program, Bard College, Annandale-on -Hudson, NY (Course: *Citizen Science*)
- 2020 - Adjunct Professor, Department of Earth and Planetary Science, Rutgers University, Piscataway, NJ (Courses: *Mineralogy, Petrology, Environmental Geology*)
- 2016 - 18 Columbia Science Postdoctoral Fellow, Lecturer in Discipline, Department of Earth and Environmental Sciences, Columbia University, New York, NY (Course: *Frontiers of Science*)
- 2012 - 13 NSF GK-12 Fellow, Learning from Earth and Ecological Field Studies (LEEFS) Graduate Fellowship Program, Columbia University, New York, NY. *Placement: Young Women’s Leadership School of East Harlem (Gr.9-12), New York, NY*
- 2012 Teaching Assistant, *Isotope Geology I*, Department of Earth and Environmental Sciences, Columbia University, New York, NY (Awarded Teaching Assistant of the Year 2012-13)
- 2011- 12 Teaching Assistant, *Earth Resources & Sustainable Development*, Department of Earth and Environmental Sciences, Columbia University, New York, NY
- 2010 Teaching Assistant, *Modern Analytical Methods in Geochemistry*, Department of Earth and Environmental Sciences, Columbia University, New York, NY
- 2007 - 09 NSF GK-12 Fellow, Fellows in the Middle: Partnerships for Inquiry and Interdisciplinary Middle School Science and Mathematics, Montclair State University, Montclair, NJ *Placements: Washington & Franklin Elementary Schools (Gr. 8), Kearny, NJ.*

RESEARCH APPOINTMENTS

- 2018 - Director of Inorganic Analysis Facility/Research Scientist, Rutgers, The State University of New Jersey, Environmental and Occupational Health Sciences Institute, Piscataway, NJ
- 2017 - 18 Research Mentor, Secondary School Field Research Program (SSFRP), Lamont-Doherty Earth Observatory, Columbia University, New York, NY

Research Project: Heavy metal distribution in surface waters of Piermont Marsh in the Lower Hudson River Estuary, NY.

- 2016 - 18 Postdoctoral Research Scientist, Geochemistry Division, Lamont-Doherty Earth Observatory, Columbia University, New York, NY (Mentors: C. Class, S. Goldstein, P. Kelemen)
Research Projects: Geochemical evolution of the lithospheric mantle; low abundance trace element patterns in abyssal peridotites
- 2014 - 17 Radiation Safety Manager, Ultraclean Laboratory, Lamont-Doherty Earth Observatory, Columbia University, New York, NY
- 2010 - 16 Graduate Research Assistant, Dept. of Earth and Environmental Sciences, Columbia University, New York, NY (Advisor: Dr. Cornelia Class)
NSF Grant 10-543: Dynamic and geochemical evolution of the lithospheric mantle beneath the Western Ross Sea Area, Antarctica (PI: C. Class, Co-PI: S. Goldstein)
- 2009 - 17 Laboratory Manager, Isotope Geochemistry Laboratory, Lamont-Doherty Earth Observatory, Columbia University, New York, NY
- 2009 - 10 Research Staff Assistant, Geochemistry Division, Lamont-Doherty Earth Observatory, Columbia University, New York, NY (Mentors: Sidney Hemming, Steven Goldstein)
- 2007 - 09 Graduate Research Assistant, Department of Earth and Environmental Studies, Montclair State University, Montclair, NJ (Advisor: Dr. Stefanie Brachfeld)
NSF Office of Polar Research Grant 0348274: CAREER: Tracing Antarctic Sediment Transport Pathways and Antarctic Ice Sheet Stability Using Iron-titanium Oxide Magnetic and Chemical fingerprints (PI: S. Brachfeld)
- 2006 - 09 Laboratory Research Technician, Marine Geology and Geochemistry, Montclair State University, Montclair, NJ (Mentors: Stefanie Brachfeld, Matthew Gorryng)

RESEARCH GRANTS

- Rutgers Office for Research Core Facilities Grant Award*** (\$ 80,000)
Cathleen Doherty (PI) 01/05/22 - 12/31/2022
Laser Ablation Inductively Coupled Plasma Mass Spectrometry (LA-ICP-MS): State of the art imaging and in-situ quantification of metals (for the acquisition of an ESI NWR213 Laser Ablation System)
- NIEHS P30 Center Grant, Rutgers Center for Environmental Exposures & Disease*** (\$ 25,000)
Cathleen Doherty (Co-PI; Brian Buckley: PI) 10/30/19 - 08/01/2020
Validation of Lead Service Line Removal as a Mitigation Technique for Lead in Tap Water
- NIEHS P30 Center Grant, Rutgers Center for Environmental Exposures & Disease*** (\$ 25,000)
Cathleen Doherty (PI) 05/26/19 - 03/01/2020
Toward source apportionment of lead in blood using high precision lead isotope ratios
- Columbia Climate Center NSF Grant*** (\$ 10,000)
Cathleen Doherty (Co-PI; Merry Cai: PI), 11/15/2016 - 12/31/2018
Provenance of the Marlboro Clay, a unique formation deposited during the Paleocene-Eocene Thermal Maximum (PETM)
- Chevron Student Initiative Fund*** (\$ 2,044)
Cathleen Doherty (PI) 11/26/2014 - 08/31/2015
Creation and calibration of new mixed isotopic spike solution for the analysis of Sm-Nd, Rb-Sr, and Lu-Hf in terrestrial samples
- Chevron Student Initiative Fund*** (\$ 950)
Cathleen Doherty (PI) 03/23/2011 - 04/01/2012
Re-Os isotope systematics of the lithospheric mantle beneath the Western Ross Sea Area, Antarctica

AWARDS AND HONORS

- 2015 Goldschmidt Student Travel Grant, Geochemical Society & NASA
- 2015 Chrysalis Scholarship Recipient, Association for Women Geoscientists
- 2013 Teaching Assistant of the Year, Dept. of Earth & Environmental Sciences, Columbia University
- 2012 Outstanding Student Paper Award in Tectonophysics Section, AGU Fall Meeting
- 2012-13 NSF Graduate STEM Fellow, NSF GK-12, Columbia University, 2012-2013
- 2009 Outstanding Graduate Student in Geoscience Award, Montclair State University
- 2007-09 NSF Graduate STEM Fellow, NSF GK-12, Montclair State University, 2007-2009
- 2007 Conservation Scholarship recipient, The Greater Pascack Valley Woman's Club
- 2006 Lechner Scholarship recipient, The Association of NJ Environmental Commissions

PROFESSIONAL AFFILIATIONS

- 2020 - EDUCAUSE
- 2018 - NSF Petrology & Geochemistry Division (Proposal Reviewer)
- 2016 - Geochemical Society
- 2015 - Association for Women Geoscientists
- 2007 - American Geophysical Union
- 2007 - Geological Society of America
- 2006 - Gamma Theta Upsilon Geographical Honor Society

PROFESSIONAL DEVELOPMENT

- 2022 Diversity Equity and Inclusivity Workshop; Truth, Racial Healing, and Transformation Center, Rutgers University, June 16, 2022
- 2022 Underrepresentation in STEM Virtual Panel, Rutgers Newark Psychology Diversity Equity and Inclusion Committee, March 4, 2022
- 2017 GeoPRISMS Theoretical and Experimental Institute (TEI) for the Rift Initiation and Evolution (RIE) initiative, February 8-10, 2017, Albuquerque, NM
- 2016 Reflective Teaching Seminar (14-week course), Columbia Center for Teaching and Learning (Sept-Dec 2016)
- 2015 Innovative Summer Teaching Institute: Preparing Doctoral Students for 21st Century Teaching, June 15-18, 2015, Graduate School of Arts & Sciences Teaching Center, Columbia University (Certificate of completion June 30, 2015)
- 2012 Cooperative Institute for Dynamic Earth Research (CIDER) 2012 Tutorial Program and Workshop: "Deep Time: How did early Earth become our modern world?" July 15, 2012-August 10, 2012, Kavli Institute for Theoretical Physics, U.C. Santa Barbara
- 2008 Communicating Science and Mathematics: GK-12 Teacher Professional Development Workshops, May 21, 2008, New Jersey Institute of Technology
- 2007 New Jersey Science Convention: Science Educator professional development, October 10, 2007, Somerset, NJ
- 2007 Connected Math Project lead by Nancy Schultz, PRISM, Montclair State University, NSF GK-12 Summer Institute, 2007
- 2007 Limited English Proficiency lead by Anna Mazzaro, PRISM, Montclair State University, NSF GK-12 Summer Institute, 2007
- 2007 Specific Learning Disabilities simulation lead Fran Greb, Montclair State University School of Education, NSF GK-12 Summer Institute, 2007

OUTREACH AND SYNERGISTIC ACTIVITIES

- 2021 - Diversity, Equity, and Inclusion Committee: Staff Representative, Environmental and Occupational Health Science Institute, Rutgers University, NJ
- 2018 - *Manuscript Reviewer*: International Journal of Environmental Research and Public Health; PLOS ONE; Journal of Health and Pollution; American Journal of Public Health
- 2021 Diversity, Equity, and Inclusion Focus Group: Staff Representative, Environmental and Occupational Health Science Institute, Rutgers University, NJ
- 2019-22 Research Mentor: Research Intensive Summer Experience (RISE) Program
- 2018-22 Research Mentor/Session Leader: Summer Undergraduate Research Fellowship (SURF) Program, Rutgers University
- 2019 Research Mentor: Mentored high school students' summer research project on "Quality of Drinking Water in NJ Schools". Assumption Regional Catholic School, Galloway, NJ. Press: <https://tinyurl.com/cwejctzm>
- 2019 Pre-K Laboratory Field Trip Host: hosted 17 students from Rutgers Psychology Child Development Center for interactive activities on chemical reactions
- 2018 Field Sampling Expert: Environmental sampling of contaminated soils and dust in Trenton, NJ, Summer Undergraduate Research Fellowship (SURF) Program, Rutgers University
- 2014-18 First Lego League, Assistant Coach, Fieldstone Middle School, Montvale, NJ
- 2015-17 Field Trip Guide, Fieldstone Middle School trip to American Museum of Natural History
- 2014-15 Mentor, Young Women's Leadership School of East Harlem (Gr. 9-12), NY
- 2014 Women in Science at Columbia University, 2012-2014: Department of Earth and Environmental Sciences Representative
- 2014 Lamont-Doherty Open House: Volcanic eruptions demonstration
- 2013 AGU Meeting Session Convener: Characterizing Antarctic Geology & Tectonics (T12A)
- 2013 Field Trip Guide: Fieldstone Middle School trip to American Museum of Natural History
- 2013 Girls Science Day at Columbia University Demonstration: Volcanic Eruptions
- 2013 A Day in the Life of the Hudson River: Site leader in water sampling studies
- 2012-13 Research Mentor, Young Women's Leadership School of East Harlem, NY
- 2012 Lamont-Doherty Open House: Volcanic eruptions demonstration, mass-spectrometer laboratory tour
- 2011 Girls Science Day at Columbia University Demonstration: Volcanic Eruptions
- 2010-11 Lamont-Doherty Earth Observatory Open House: Volcanic eruptions demonstration
- 2010 Mentor, Research Experience for Undergraduates (REU), Lamont-Doherty Summer Intern Program, Columbia University
- 2009 Math & Science Day Workshop Leader: Analyzing Antarctic Ice Cores, Montclair State University
- 2009 Science Fair Judge: Benjamin Franklin Middle School, Teaneck, NJ
- 2008 Math & Science Day Workshop Leader: Antarctic Marine Sediments, Montclair State University
- 2003-07 New Jersey Community Water Watch, Chapter President, Montclair State University

FIELD RESEARCH EXPERIENCE

- 2022 Environmental Field Sampling Leader: heavy metal contaminant sampling in the Elizabeth, NJ, Summer Undergraduate Research Fellowship (SURF) and Research Intensive Summer Institute (RISE) Programs, Rutgers University, NJ

- 2021 New Jersey Transit Field Validation Scientist: Testing the Efficacy and Persistence of Quaternary Ammonium Compounds (QACs) for Surface Disinfection of COVID-19
- 2020 New Jersey Transit Field Validation Scientist: Testing the Efficacy of Ultraviolet (UV-C) and Other Disinfection Devices for Public Transit in Response to COVID-19
- 2020-21 Remote Sampling Training Leader: Citizen Scientist water sampling for lead contamination in home drinking water. Exposure Science and Toxicology Division, Environmental & Occupational Health Science Institute, Rutgers University, NJ
- 2019 Field sampling instructor for heavy metal contamination in water samples from the Raritan River, NJ. Exposure Science and Toxicology Division, Environmental & Occupational Health Science Institute, Rutgers University, NJ
- 2018 Field sampling instructor for soil, water, and dust for exposure to legacy contamination in Trenton, NJ. Exposure Science and Toxicology Division, Environmental & Occupational Health Science Institute, Rutgers University, NJ
- 2017 Piermont Marsh, NY: Field Sampling and Research Mentor for the Learning from Earth and Ecological Field Studies (LEEFS) Summer Program. Field sampling for heavy metal distribution in surface waters of Piermont Marsh in the Lower Hudson River Estuary, NY. Lamont Doherty Earth Observatory, Columbia University, NY
- 2013 Semail Ophiolite: Oman field trip, 2013, Petrology and high/low temperature alteration of ophiolite sequence and natural carbon capture and mineralization for CO₂ storage
- 2011 Wyoming student organized field trip: Wyoming regional geology, Yellowstone, and the Stillwater complex
- 2006 Antarctica Peninsula: Marine Geology and Geophysics field season aboard *R.V. Nathaniel B. Palmer*. Water, marine sediment, and specimen sampling for paleo-climate research, and bathymetric mapping of seafloor beneath the collapsed Larsen B iceshelf.
- 2006 St. John, USVI: Marine Biology and Ecology field work investigating mangrove and seagrass biodiversity

SEMINARS AND INVITED TALKS

- 2022 “Earth as a Geochemical System: From chemical evolution in Antarctica to environmental health in New Jersey”, Environmental Studies and Sustainability Program, Drew University, Madison, NJ. March 23, 2022 (**Invited Talk**)
- 2022 “Great Challenges in Environmental Science: Environmental Health and Toxicology”, Environmental Studies and Sustainability Program, Drew University, Madison, NJ. March 23, 2022 (**Guest Lecture**)
- 2021 Interactive Session on Lead Exposure and Toxicity: “Analytical Methods for Testing Lead in Home Drinking Water”. Summer Undergraduate Research Fellowship Program Symposium, Rutgers University, Environmental & Occupational Health Sciences Institute, Piscataway, NJ, July 29, 2020 (**Invited Talk**)
- 2020 Environmental Lead Exposure: “Testing Lead and Heavy Metals in Home Drinking Water”. Summer Undergraduate Research Fellowship Program Symposium, Rutgers University, Environmental & Occupational Health Sciences Institute, Piscataway, NJ, July 27, 2020 (**Invited Talk**)
- 2019 “Earth as a Geochemical System: From lithospheric mantle evolution in Antarctica to environmental health in New Jersey”, Department of Earth and Planetary Sciences Colloquium, Rutgers University, Piscataway, NJ. October 30, 2019 (**Invited Talk**)
- 2019 “Lead in Newark Drinking Water: Identifying Sources and Verifying Mitigation Strategies. Rutgers Center for Environmental Exposures and Disease Environmental Health Summit, Newark, NJ. October 25, 2019 (**Invited Talk**)

- 2019 Environmental Lead Exposure: Metal Analysis in Potable Water. Summer Undergraduate Research Fellowship Program, Rutgers University, Environmental & Occupational Health Sciences Institute, Piscataway, NJ, July 25, 2019 **(Invited Talk)**
- 2018 Metal Concentration Analysis in Potable Water Sources. Summer Undergraduate Research Fellowship Program, Rutgers University, Environmental & Occupational Health Sciences Institute, Piscataway, NJ, July 19, 2018 **(Invited Talk)**
- 2016 “Beneath the Ice: Antarctica’s history recorded in mantle xenoliths”, Science Spotlight Public Lecture Series, Columbia University, December 1, 2016 **(Invited Talk)**
- 2015 “Geochemical Evolution of the Lithospheric Mantle in the West Antarctic Rift System”, Department of Earth & Planetary Sciences Seminar, American Museum of Natural History, NY, October 2015 **(Invited Talk)**
- 2015 “Lithospheric mantle evolution of the Western Ross Sea Area in the West Antarctic Rift System”, Research Experience for Undergraduates (REU) Summer Intern Lecture Series, Lamont-Doherty Earth Observatory, Columbia University, July 16, 2015 **(Invited Talk)**
- 2015 “Geochemical Evolution of the Lithospheric Mantle in the West Antarctic Rift System”, Department of Earth & Environmental Science, Sustainability Seminar Series, Montclair State University, NJ, April 5, 2015 **(Invited Talk)**
- 2014 “Melt depletion and geochemical evolution of the lithospheric mantle in the West Antarctic Rift System”, Lamont-Doherty Earth Observatory, Columbia University, Geochemistry Seminar Series, October 2014
- 2013 “Understanding the behavior of the mantle in the West Antarctic Rift System using Re-Os isotopes”, Secondary School Field Research Program-Piermont Marsh, August 2, 2013 **(Invited Talk)**
- 2013 “Re-Os systematics of the lithospheric mantle beneath the Western Ross Sea area, Antarctica: Depletion ages and dynamic response during rifting”. Lamont-Doherty Earth Observatory, Columbia University, Geodynamics Seminar Series, October 2013
- 2013 “Procedural blanks and isobaric interferences: measuring Os isotopes via N-TIMS”, Mass Spectrometry Special Seminar, Lamont-Doherty Earth Observatory, Columbia University, May 2013
- 2012 Re-Os Systematics Reading Seminar Leader, Lamont-Doherty Earth Observatory, Columbia University, Summer 2012

PUBLICATIONS († = mentored student)

1. †Lazofsky, A.T., **Doherty, C.L.**, Buckley, B.T., 2022. A Simple Surface Sampling and Liquid Chromatography Mass Spectrometry Method for the Analysis of Quaternary Ammonium Compounds Collected from Public Transportation Vehicles in NJ. *Emerging Contaminants*
2. Karas, B., **Doherty, C.L.**, Cooper, K.R., Buckley, B.T., *IN PRESS*. Dose Determination of Metal and Metal-based Compound Exposure in Zebrafish Larvae using Inductively Coupled Plasma Mass Spectrometry (ICPMS). *JoVE Journal*
3. †D’Errico, J N., **Doherty, C L.**, Reyes George, J., Buckley, B T., Stapleton, P A., 2022. Maternal, Placental, and Fetal Distribution of Titanium Dioxide Nanoparticles After Repeated Inhalation Through Pregnancy. *PLACENTA*.
4. Buckley, B.T., Buckley, R., **Doherty, C.L.**, 2021. Moving Toward a Handheld “Plasma” Spectrometer for Elemental Analysis, Putting the Power of the Atom (Ion) in the Palm of Your Hand. *Molecules*, 26(16):4761. <https://doi.org/10.3390/molecules26164761>
5. Wen, X., Kozlosky, D., Zhang, R., **Doherty, C.L.**, Buckley, B.T., Barrett, E., Aleksunes, L., 2021. BCRP/ABCG2 Transporter Regulates Accumulation of Cadmium in Kidney Cells: Role of the Q141K Variant in Modulating Nephrotoxicity. *Drug Metabolism and Disposition*

6. **Doherty, C.L.**, Buckley, B.T., 2021. Translating Analytical Techniques in Geochemistry to Environmental Health. *Molecules*, 26 (9), 2821. <https://doi.org/10.3390/molecules26092821>
7. Martin, A. P., Cooper, A. F., Price, R. C. **Doherty, C. L.**, Gamble, J.A., 2021. A review of mantle xenoliths in volcanic rocks from southern Victoria Land, Antarctica. *Geological Society, London, Memoirs (2021):M56-2019-42*. <https://doi.org/10.1144/M56-2019-42>
8. Pereira, P.S., van de Fliedrt, T., Hemming, S.R., Frederichs, T., Hammond, S.J., Brachfeld, S., **Doherty, C.**, Kuhn, G., Smith, J.A., Klages, J.P. and Hillenbrand, C.D., 2020. The geochemical and mineralogical fingerprint of West Antarctica's weak underbelly: Pine Island and Thwaites glaciers. *Chemical Geology*, 119649.
9. Côte-Real, L., Karas, B., Brás, A.R., Pilon, A., Avecilla, F., Marques, F., Preto, A., Buckley, B., Cooper, K., **Doherty, C.**, Garcia, M., Valente, A., 2019. Ruthenium-Cyclopentadienyl Bipyridine-Biotin Based Compounds: Synthesis and Biological Effect. *Inorganic Chemistry*, 58(14), 9135-9149.
10. D'Errico, J.N., **Doherty, C.**, Fournier, S.B., Renkel, N., Kallontzi, S., Goedken, M., Fabris, L., Buckley, B., Stapleton, P.A. 2019. Identification and quantification of gold engineered nanomaterials and impaired fluid transfer across the rat placenta via ex vivo perfusion. *Journal of Biomedicine & Pharmacotherapy*, 117, p.109148.
11. Karas, B.F., Côte-Real, L., **Doherty, C.L.**, Valente, A., Cooper, K.R., Buckley, B.T., 2019. A novel screening method for transition metal-based anticancer compounds using zebrafish embryolarval assay and inductively coupled plasma-mass spectrometry analysis. *Journal of Applied Toxicology*, 3802.
12. Côte-Real, L., Karas, B., Gírio, P., Moreno, A., Avecilla, F., Marques, F., Buckley, B.T., Cooper, K.R., **Doherty, C.**, Falson, P., Garcia, M.H., Valente, A., 2018. Unprecedented inhibition of P-gp activity by a novel ruthenium-cyclopentadienyl compound bearing a bipyridine-biotin ligand. *European Journal of Medicinal Chemistry*, 163, 853-863. <https://doi.org/10.1016/j.ejmech.2018.12.022>
13. Simões Pereira, P., van de Fliedrt, T., Hemming, S. R., Hammond, S. J., Kuhn, G., Brachfeld, S., **Doherty, C.**, Hillenbrand, C-D, 2018. Geochemical fingerprints of glacially eroded bedrock from West Antarctica: Detrital thermochronology, radiogenic isotope systematics and trace element geochemistry in Late Holocene glacial-marine sediments. *Earth-Science Reviews*, 182, 204-232p, doi.org/10.1016/j.earscirev.2018.04.011.
14. Bologna, P.A.X., Papagian, R., Regetz, S., **Dale, C.**, 2008. Assessment of turtle grass (*Thalassia testudinum* ex Banks Konig) community structure in a UNESCO Biosphere Reserve. *Journal of Experimental Marine Biology and Ecology*, 365, 2, 148-155p. 1.

IN REVIEW

1. †Stratton, S.A., **Doherty, C.L.**, Buckley, B.T., The Lead and Copper Rule Old and New, Limitations and Lessons Learned from Newark, New Jersey. *WIREs Water*

IN PREPARATION

1. Emily S. Barrett, Zorimar Rivera-Núñez, Kylie Getz, Pamela Ohman-Strickland, Ranran Zhang, Danielle Kozlosky, **Cathleen Doherty**, Brian T. Buckley, Jessica Brunner, Carolyn Salafia, Richard K. Miller, Thomas O'Connor, Lauren M. Aleksunes. Prenatal cadmium exposure in relation to placenta and birth size: effect modification by fetal sex and genetic variation in the ABCG2 transporter. To be submitted to *Environment International* in September 2022.
2. **Doherty, C.L.**, Butch, K., Crespo, L., Buckley, B.T., Aleksunes, L.M. *Environmental Health Science in Action: Field Sampling with Community Partners*. To be submitted to CourseSource Evidence-based teaching resources for undergraduate biology and physics in 2022.
3. **Doherty, C.L.**, et al. Persistence of industrial legacy site contamination in Trenton, NJ identified using heavy metal and lead isotope analysis for source apportionment. To be submitted to *Journal of Exposure Science and Environmental Epidemiology* in 2022.

4. **Doherty, C.L.**, et al. Paleoproterozoic stabilization of the lithospheric mantle beneath the Western Ross Sea area, Antarctica. To be submitted to Earth and Planetary Science Letters in 2023.
5. **Doherty, C.L.**, Karas, B., et al. Heavy Metal Analysis of Potable Water Sources: An Educational Activity to Introduce Undergraduate Students to Toxicology.
6. Isotopic constraints on the depletion and metasomatic history of the lithospheric mantle beneath the West Antarctic Rift System and its role in intraplate magmatism.

THESES

1. **Doherty, C.L.**, 2016. Multi-stage evolution of the lithospheric mantle in the West Antarctic Rift System—a mantle xenolith study, Columbia University Department of Earth and Environmental Sciences, New York, NY, Ph.D. Thesis
2. **Dale, C.L.**, 2009. Geochemical and petrographic signatures from Marie Byrd Land and Larsen-B Ice Shelf: Implications for provenance tracing, Montclair State University Department of Earth and Environmental Studies, Montclair, NJ, M.S. Thesis

CONFERENCE PROCEEDINGS († = mentored student; § = mentored teacher)

1. †Bermeo Grajoles, D., Urias, S., **Doherty, C.L.**, Gemmellaro, D., 2023. Extraction and quantification of toxic heavy metals from Calliphoridae larvae. American Academy of Forensic Sciences Conference, February 13-18, 2023. (*abstract accepted*)
2. Urias, S., †Bermeo Grajoles, D., **Doherty, C.L.**, Gemmellaro, D., 2023. Effects of lead on the growth rate of *Phormia regina* (Meigen) (Diptera: Calliphoridae). American Academy of Forensic Sciences Conference, February 13-18, 2023. (*abstract accepted*)
3. Stefanie Brachfeld, Olga Libman-Roshal, Ashley Cirone, **Cathleen Doherty**, Shane Nicols-O’Neil, Brendan T. Reilly, Lisa Tauxe, Michael E. Weber, Maureen Raymo, Victoria Peck, Trevor Williams, Ian Bailey, Sidney Hemming, Suzanne O’Connell, Michael Kaplan, Kathy Licht, and the IODP Expedition 382 Science Team, 2022. Late Pleistocene Atmosphere-Ocean-Ice Sheet Coupling in the Scotia Sea. American Geophysical Union Meeting, December 12-16, 2022. (*abstract accepted*)
4. †Bermeo Grajoles, D., **Doherty, C.L.**, Gemmellaro, D., 2022. Detection and quantification of toxic heavy metals on Calliphoridae larvae. Entomological Society of America Meeting, Vancouver, BC, Canada. November 13-16, 2022 (*abstract accepted*)
5. Barrett, ES, Rivera-Nunez, Z, Getz, K, Ohman-Strickland, P, Zhang, R, Kozlosky, D, **Doherty, C**, Buckley, B, Brunner, J, Salafia, C, Miller, R, O’Connor, T, Aleksunes, L. Prenatal cadmium exposure in relation to placental and birth size: effect modification by fetal sex and genetic variation in the placental barrier transporter ABCG2. Oral presentation at the 35th Annual Conference of the International Society for Environmental Epidemiology (ISEE 2021). Athens, Greece. September 2022. (*abstract accepted*)
6. †Kozlosky L., Lu A., **Doherty C.L.**, Brian Buckley B., Goedken M.J., Barrett E., Aleksunes L.M. 2022. *In Utero* Cadmium Exposure Disrupts Development of the Placental Vasculature Leading to Growth Restriction in Male Offspring. Society of Toxicologic Pathology Meeting, Austin, TX. June 19-23, 2022
7. Aleksunes LM, **Doherty C**, Smith C, †Abustan M, Andres J, Walker L, Bellomo A, Laskin DL, 2022. Hybrid Summer Internships Facilitate Nationwide Collaboration in Toxicology Training. Society of Toxicology Meeting, San Diego, CA. March 27-31, 2022
8. †Abustan M., Chen Y., **Doherty C.L.**, Wen X., Buckley B., Joy M.S., Aleksunes L.M., 2022. Establishing an In Vitro Model for Screening Transporter-Mediated Cisplatin Drug Interactions. Society of Toxicology Meeting, San Diego, CA. March 27-31, 2022

9. †Kozlosky L., Lu A., **Doherty C.L.**, Brian Buckley B., Goedken M.J., Barrett E., Aleksunes L.M. 2022. *In Utero* Cadmium Exposure Disrupts Development of the Placental Vasculature Leading to Growth Restriction in Male Offspring. Society of Toxicology Meeting, San Diego, CA. March 27-31, 2022
10. †Lazofsky, A.T., **Doherty, C.L.**, Szary, P., Buckley, B.T., Surface Sampling and Liquid Chromatography Mass Spectrometry Method for the Analysis of Quaternary Ammonium Compounds Collected from Public Transportation Vehicles in NJ. American Chemical Society Meeting, San Diego, CA. March 20-24, 2022
11. †Reyes George, J., †D'Errico, J N., **Doherty, C L.**, Buckley, B T., Stapleton, P A., 2021. Ti deposition in fetal tissue exposed through maternal nano-TiO₂ inhalation during pregnancy. SACNAS National Diversity in STEM (NDiSTEM) Digital Conference. July 16, 2021.
12. **Doherty C.L.**, Smith LC, Buckley B, Li M, Henry Z, Walker L, Laskin DL, Aleksunes LM, 2021. Environmental Health Sciences Training-At-Home During a Pandemic. Society of Toxicology Meeting. Virtual Event, March 2021
13. †Gorczyca L, Meakin C, **Doherty C.L**, Buckley B, Aleksunes LM, 2021. Placental ABCC5/MRP5 Transporter Regulates Trophoblast Cell Fusion and Hormone Production. Society of Toxicology Meeting. Virtual Event, March 2021
14. †Abustan M., Chen, Y., **Doherty, C.L.**, Wen, X., Buckley, B., Joy, M.S., Aleksunes, L.M., 2021. Establishing an *In Vitro* Model for Screening Transporter-Mediated Cisplatin Drug Interactions. Society of Toxicology Meeting. Virtual Event, March 2021
15. Pereira, P.S., van de Flierdt, Hillenbrand, C.D., T., Hemming, S.R., Frederichs, T., Hammond, S.J., Brachfeld, S., **Doherty, C.**, Larter, R., Smith, J.A., Kuhn, G., Klages, J.P., Gohl, K., Frederichs, T., Hammond, S., 2020. Tracing West Antarctic ice stability in the Amundsen Sea during Late Pleistocene Warm Times. Scientific Committee on Antarctic Research (SCAR) Conference, Hobart, Tasmania. August 3-7, 2020.
16. †Stratton, S., **Doherty, C.L.**, Buckley, B., 2020. Identifying Pb Sources in Newark Homes, with Help from the Residents. National Environmental Health Association Annual Educational Conference, New York, NY. July 13-16, 2020.
17. **Doherty, C.**, Smith, L.C., Laskin, D.L., Aleksunes, L.M., Buckley, B.T, 2020. Team Science in a Summer Undergraduate Fellowship: Field Sampling for Metal Contamination in the Raritan River. Society of Toxicology Meeting, Anaheim, CA. March 15-19, 2020
18. Wen, X., **Doherty, C.**, Buckley, B., Aleksunes, L.M., 2020. Loss-of-Function Variant in the BCRP/ABCG2 Transporter Increases Cadmium Renal Injury In Vitro. Society of Toxicology Meeting, Anaheim, CA. March 15-19, 2020
19. Zhang, R., Wen, X, **Doherty, C.**, Buckley, B., Barrett, E., Aleksunes, L.M., 2020. Interaction of the Human Placental BCRP/ABCG2 Transporter with Cadmium. Society of Toxicology Meeting, Anaheim, CA. March 15-19, 2020
20. †Anthony, S., Zhang, R., Gorczyca, L., **Doherty, C.**, Buckley, B., Aleksunes, L., 2019. Metal-related Sequestration Genes and Environmental Contaminants in Human Placentas. Annual Biomedical Research Conference for Minority Students, Anaheim, CA. November 13-16, 2019
21. §Guerrier, R., **Doherty, C.**, Smith, L.C., Pivnick, E., Aleksunes, L., Buckley, B., Laskin, D., 2019. From the Community to the Laboratory: Field Research to Advance Student Learning. Experimental Biology 2019 Meeting, Orlando, FL. April 6-9, 2019.

22. **Doherty, C.L.**, §Guerrier, R., Smith, L.C., Laskin, D., Pivnick, E., Aleksunes, L.M., Buckley, B., 2019. Engagement of Undergraduate Students in Community-Based Environmental Health Science. Society of Toxicology Meeting, Baltimore, MD. March 10-14, 2019
23. †Kozlosky, D., **Doherty, C.**, Buckley, B., Goedken, M., Aleksunes, L.M., 2019. Disposition and Toxicity of Cadmium in Wild-type and Bcrp-Null Mice Following Acute Exposure. Society of Toxicology Meeting, Baltimore, MD. March 10-14, 2019
24. †JN D'Errico, SB Fournier, **Doherty, C.L.**, Renkel, N, Buckley, B., Fabris, L., Kallontzi, M., Goedken, M., Yurkow, E, Alder, D., Stapleton, P., 2018. Quantifying placental transfer of engineered nanomaterials using a novel *in situ* model. Society of Toxicology Meeting, San Antonio, TX. March 10-15, 2018
25. **Doherty, C.L.**, Class, C., S. B. Shirey, S. L. Goldstein, A. F. Cooper, A. P. Martin, J. H. Berg, J. A. Gamble, 2017. Multi-Stage Evolution of the Lithospheric Mantle in the West Antarctic Rift System. GeoPRISMS RIE TEI Workshop, 2017
26. **Doherty, C.L.**, Class, C., S. B. Shirey, S. L. Goldstein, A. F. Cooper, A. P. Martin, J. H. Berg, J. A. Gamble, 2015. Lithospheric mantle evolution of the Western Ross Sea Area in the West Antarctic Rift System. Goldschmidt Conference, August 20, 2015. (**Oral Presentation**)
27. **Doherty, C.L.**, Class, C., S. B. Shirey, S. L. Goldstein, A. F. Cooper, A. P. Martin, J. H. Berg, J. A. Gamble, 2013. Re-Os systematics of the lithospheric mantle beneath the Western Ross Sea area, Antarctica: depletion ages and dynamic response during rifting. American Geophysical Union Meeting, December 9-13, 2013.
28. **Doherty, C.L.**, Class, C., S. B. Shirey, S. L. Goldstein, A. F. Cooper, A. P. Martin, J. H. Berg, J. A. Gamble, 2013. Constraining the dynamic response of subcontinental lithospheric mantle to rifting using Re-Os model ages in the Western Ross Sea, Antarctica. Graduate Student Symposium, March 1, 2013.
29. Lloyd, A., Bouilhol, P., Carlson, R.W., **Doherty, C.L.**, Emry, E.L., Li, M., Paulson, E., Wiens, D.A., Yuan, H., 2012. Reconciling geophysical and geochemical data to understand craton architecture. American Geophysical Union Meeting, December 3-8, 2012.
30. Bouilhol, P., Carlson, R.W., **Doherty, C.L.**, Emry, E.L., Li, M., Paulson, E., Wiens, D.A., Yuan, H., 2012. Reconciling geophysical and geochemical data to understand craton architecture and stability: Special focus on the Kaapvaal, Slave, and North Atlantic Cratons. Post-AGU 2012 Cooperative Institute for Dynamic Earth Research (CIDER) Workshop, University of California, Berkeley. December 8, 2012.
31. **Doherty, C.L.**, Class, C., S. B. Shirey, S. L. Goldstein, A. F. Cooper, A. P. Martin, J. H. Berg, J. A. Gamble, 2012. Constraining the dynamic response of subcontinental lithospheric mantle to rifting using Re-Os model ages in the Western Ross Sea, Antarctica. American Geophysical Union Meeting, December 3-8, 2012.
32. **Doherty, C.L.**, Class, C., S. B. Shirey, S. L. Goldstein, A. F. Cooper, A. P. Martin, J. H. Berg, J. A. Gamble, 2012. Constraints on the dynamic response of subcontinental lithospheric mantle to rifting from Re-Os model ages – a case study from the Western Ross Sea Area, Antarctica. Cooperative Institute for Dynamic Earth Research (CIDER) Summer Program, UC Santa Barbara, CA, July-August 2012.
33. Williams, T., Hemming, S.R., van de Flierdt, T., Brachfeld, S., Pierce, E., **Dale, C.**, Cook, C., Goldstein, S., Roy, M., 2011. Isotope geochemistry of circum-Antarctic marine core tops for sub-glacial geology and sediment provenance. International Symposium of Antarctic Earth Sciences, July 2011.

34. Brachfeld, S., Cuomo, D., van de Flierdt, T., Hemming, S., **Dale, C.**, Goldstein, S., Pierce, E., Williams, T. 2011. Iron oxide geochemistry and texture as a tracer of Antarctic sediment provenance. International Symposium of Antarctic Earth Sciences, July 2011.
35. Hemming, SR., Goldstein, SL., Van De Flierdt, T., Pierce, E., **Dale, C.**, Williams, T., Brachfeld, S., Licht, KJ., 2010. Tracing Antarctica's terrigenous sediment contributions to the Southern Ocean. *Geochimica et Cosmochimica Acta*, Goldschmidt Conference, August 2010
36. **Dale, C.**, Brachfeld, S., Hemming, S., van de Flierdt, T., 2009. Geochemical and petrographic signatures from Marie Byrd Land and Larsen-B Ice Shelf sediments: Implications for provenance tracing. NSF GK-12 Annual Meeting, March 27-29, 2009.
37. **Dale, C.**, Brachfeld, S., Hemming, S., van de Flierdt, T., 2009. Geochemical and petrographic signatures from Marie Byrd Land and Larsen-B Ice Shelf sediments: Implications for provenance tracing. Poster selected for presentation at NSF Headquarters, Arlington, VA, March 26, 2009.
38. **Dale, C.**, Brachfeld, S., Hemming, S., van de Flierdt, T., 2008. Geochemical and lithology results from Marie Byrd Land and Larsen-B Ice Shelf sediments: Implications for provenance tracing. American Geophysical Union Meeting, December 15-19, 2008.
39. Hemming, S., Brachfeld, S., **Dale, C.**, Ar-Ar Ages of Glacially Derived Detrital Hornblende Grains along the West Antarctic Margin. American Geophysical Union Meeting, December 15-19, 2008.
40. **Dale, C.**, Brachfeld, S., Hemming, S., van de Flierdt, T., 2008. Geochemical and ϵ_{Nd} results from Larsen-B Ice Shelf and Marie Byrd Land sediments: Implications for provenance tracing. Joint Annual Meeting Geological Society of America, October 5-9, 2008. (**Oral Presentation**)
41. **Dale, C.**, Brachfeld, S., Hemming, S., van de Flierdt, T., 2008. Tracing Larsen Ice Shelf and West Antarctic Ice-Sheet stability through sediment provenance. Antarctic Peninsula Climate Change Meeting, June 24-26, 2008, UC Urvine.
42. **Dale, C.**, Brachfeld, S., Hemming, S., van de Flierdt, T., 2008. Tracing Antarctic Ice-Sheet stability through sediment provenance. Sigma Xi Student Research Symposium, May 3, 2008, Montclair, NJ.
43. **Dale, C.**, Regetz, S., Papagian, R., Ward, D., Townsend, T., Bologna, P., 2006. Sediment size, structure, and organic carbon content of *Rhizophora mangle* and *Thalassia testudinum* beds, in St. John, United States Virgin Islands, New Jersey Academy of Sciences Meeting, April 15, 2006. Sigma Xi Student Research Conference, May 6, 2006, Montclair, NJ.
44. Papagian, R., Regetz, S., **Dale, C.**, Townsend, T., Ward, D., Kontos, C., Rudorfer, E., Gizas, M., Bologna, P., 2006. A comparative study of seagrass (*Thalassia testudinum*) and mangrove (*Rhizophora mangle*) community structure in St. John, USVI, New Jersey Academy of Sciences Meeting, April 15, 2006. Sigma Xi Student Research Conference, May 6, 2006, Montclair, NJ.
45. Townsend, T., Papagian, R., Ward, D., Kontos, C., **Dale, C.**, Regetz, S., Bologna, P., 2006. An assessment of the relationship of *Didema antillarum* and juvenile coral reef fishes, New Jersey Academy of Sciences Meeting, April 15, 2006. Sigma Xi Student Research Conference, May 6, 2006, Montclair, NJ.

Select presentations by mentored undergraduate students (*) and high school students (+)

1. Haroon, A. +, Chowdhury, A. +, Feng, S. +, Fernandez, R. +, Lopez, C. +, Reyes, N. *, **Doherty, C.**, Newton, R., 2012. Carbon Content of Sediment in Piermont Marsh, Hudson River Estuary. Poster, Geological Society of America Annual Meeting, Charlotte, NC, November 4-7, 2012

2. Tatiana Gallardo⁺, **Cathleen Doherty**, Martha Montufar⁺, and Susan Vincent, 2013. Levels of Enterococcus and Nutrients in Piermont Marsh. Poster, Society of Wetlands Scientists, Duluth, MN, June 2-6, 2013
3. Areej Haroon⁺, Amira Chowdhury⁺, **Cathleen Doherty**, Shiyong Feng⁺, Rossibel Fernandez⁺, Cristal Lopez⁺, Nunny Reyes*, Susan Vincent, 2013. Modern and Past Carbon Dynamics in Piermont Marsh, Hudson River Estuary. Poster, Society of Wetlands Scientists, Duluth, MN, June 2-6, 2013
4. Keyla Lora⁺, **Cathleen Doherty**, Susan Vincent, 2013. Seasonal Changes in Plankton Community of Piermont Marsh. Poster, Society of Wetlands Scientists, Duluth, MN, June 2-6, 2013
5. Nancy Ramirez⁺, Lavern Cash⁺, **Cathleen Doherty**, Susan Vincent, 2013. Impact of Invasive Plant Species Phragmites Australis in Piermont Marsh. Poster, Society of Wetlands Scientists, Duluth, MN, June 2-6, 2013
6. Fernandez, R. ⁺, Haroon, A. ⁺, Lopez, C. ⁺, Poster, New York City Science and Engineering Fair, Finals Round, American Museum of Natural History, March 19, 2013. 2nd Place Award.
7. Mabson, M.*; Pierce, E. L.; **Dale, C. L.**; Williams, T.; Hemming, S. R.; van de Flierdt, T.; Cook, C.; Goldstein, S. L., 2010. Variations in the Nd isotope composition of Late Miocene to Early Pliocene glacially derived sediments in Prydz Bay, East Antarctica, American Geophysical Union Meeting, December 2010
8. Gombiner, J.*; Hendy, I., Hemming, S., Fleisher, M., **Doherty, C.**, 2010. Spatial and temporal variation of last ice age mega-floods in the Pacific Northwest: Sediment provenance using single-aliquot K/Ar dating, American Geophysical Union Meeting, December 2010

CURRENT MENTORED STUDENTS

- 2022- Daniela Bermeo Grajales, Kean University, Dept. of Chemistry, RISE Mentee
- 2022- Justin Epstein, Oberlin College, Chemistry Intern, Undergraduate Student
- 2021- Christopher Stradford, Rutgers University, Toxicology Program, MS Student
- 2018- Sean Stratton, Rutgers University, School of Public Health, PhD Student
- 2018- Danielle Kozlosky, Rutgers University, Toxicology Program, PhD Student

PAST STUDENTS

- 2021- 22 Yufei Wu, Rutgers University, Dept. of Chemistry, Undergraduate Thesis Mentee
- 2021- 22 Jatin Jain, Rutgers University, Ernest Mario School of Pharmacy, Pharmacy Student
- 2018- 21 Jeanine D'Errico, Rutgers University, Toxicology Program, PhD Student
- 2021 Jarett Reyes George, Rutgers University, RISE/SURF Program, Undergraduate
- 2019 Shabree Anthony, University of the Virgin Islands, RISE/SURF Program, Undergraduate
- 2019 Brittany Phan, Rutgers Ernest Mario School of Pharmacy, PharmD Candidate
- 2018- 20 Brittany Karas, Rutgers University, Toxicology Program, PhD Student
- 2016- 17 Secondary School Field Research Program (SSFRP)
I served as a research mentor to a team of 6 high school students and 2 college students conducting a 6-week intensive research project. *Project title: Heavy metal distribution in surface water samples from Piermont Marsh, NY in the Lower Hudson River Estuary*
- 2012-14 Young Women's Leadership School, East Harlem, NY
I served as a research mentor to a team of 20 high school students conducting wetlands science research, competing in the NY Science and Engineering Fair, and presenting their research at national conferences. *Project title: Modern and past carbon dynamics in Piermont Marsh, Hudson River Estuary*

- 2010 Michele Mabson, Howard University, Lamont Summer Intern Program (REU)
Project title: Variations in the Nd isotope composition of Late Miocene to Early Pliocene glacially derived sediments in Prydz Bay, East Antarctica
- 2010 Joel Gombiner, Columbia University, Lamont Summer Intern Program (REU)
Project title: Spatial and temporal variation of last ice age mega-floods in the Pacific Northwest: Sediment provenance using single-aliquot K/Ar dating

ANALYTICAL AND INSTRUMENTATION EXPERIENCE

- Nu AttoM High Resolution Inductively Coupled Plasma Mass Spectrometer (ICP-MS)
- Thermo Scientific Neptune *Plus* Multi-Collector ICP-MS
- Thermo-Fisher Triton Thermal Ionization Mass Spectrometer (TIMS)
- Thermo VG Plasma Quad Excell ICP-MS
- New Wave UP 193 FX Excimer Laser Ablation System (LA-ICP-MS)
- Agilent 700 Inductively Coupled Plasma Optical Emission Spectrometer (ICP-OES)
- Cameca SX-100 electron microprobe (EMP)
- Axiom Multi-Collector ICP-MS (MC-ICP-MS)
- Zeiss Aksioskop Petrographic Microscope and AxioVision camera software
- CEM Microwave digestion system
- SELFRAG high voltage pulsed power fragmentation of rocks
- Magnetic separation techniques for rocks powders/minerals
- Method development for the analyses of low abundance trace elements in rocks/sediments, water, plants, animal/human specimens (tissue, blood, urine), and synthetic materials
- Isotope dilution, rock dissolution, acid distillation, and column chromatography
- Low concentration ultra-clean lab chemistry
- Analysis of major elements, trace elements, and Sr-Nd-Hf-Pb-Os isotope systems, and the ability to set up these methods and train others in new laboratories

RELEVANT COURSEWORK

Frontiers of Science, Earth Resources and Sustainable Development, Paleoceanography, Environmental Geochemistry, Isotope Geology, Advanced Isotope Geochemistry, Advanced Marine Geology, Environmental Geoscience, Mineralogy, Igneous & Metamorphic Petrology, Geochronology & Thermochronology, Modern Analytical Methods in Geochemistry, Tectonics, Evolutionary Biology, Physical Geology, Historical Geology, Geologic Mapping, Structural Geology, Stratigraphy, Teaching for Critical Thinking, Reflective Teaching Seminar, Innovative Teaching Summer Institute