Mia Teresa Tuccillo

email: miatuccillo@u.northwestern.edu

website: miattuccillo.com

CV Updated: 16 July 2025

Northwestern University Department of Earth, Environmental & Planetary Sciences
Technological Institute: 2145 Sheridan Road, Evanston, IL 60208-3130 U.S.A.

Based in Chicago, IL and New York, NY, on the unceded homelands of the Council of Three Fires – Ojibwe, Odawa, & Potawatomi Nations – the Miami, Ho-Chunk & Menominee nations, and on the ancestral lands of the Lenape peoples (Lenapehoking), respectively.

EDUCATION

Sept. 2020 - Present	Ph.D. Candidate in Earth, Environmental & Planetary Sciences Northwestern University
Sept. 2016 - May 2020	B.A. in Biogeochemistry Wellesley College

RESEARCH & PROFESSIONAL INTERESTS

Paleolimnology, (paleo)ecology, sedimentary pigments, current & past climates, cyanobacterial blooms, water security and quality in the Arctic, Indigenous and local knowledge, building reciprocity between scientists and communities, science communication, science publishing, mentoring & education of diverse audiences.

FELLOWSHIPS, GRANTS & AWARDS

National Science Foundation Polar STEAM Fellow - Polar Educators Program (2024-2025)

NSF-funded program that matches polar researchers with educators teaching natural science to underrepresented populations to facilitates virtual collaborations between scientists conducting research in the polar regions and teachers developing curriculums or educational programming.

National Science Foundation Doctoral Dissertation Research Improvement Grant (NSF-DDRI, Arctic Systems Science; 2024)

Awarded Proposal: “A Paleolimnological Investigation of Climate and Nitrogen Impacts on Primary Producers in Greenland Lakes and Community Water Supplies.” Co-PI with Dr. Yarrow Axford, Northwestern University. Award supports one scientific field season (Narsaq, Greenland) and community relations and networking trips to Nuuk, Greenland and Washington, D.C.
NSF Award # 2330271

Northwestern University Buffett Institute of Global Affairs Fellowship (2023-2024)

Funded program for Ph.D. students whose research is interdisciplinary, international, and exhibits relevance to at least one of the 17 United Nations Sustainable Development Goals. I was selected in part for my research on Greenland's lakes, which has relevance to the UN's priority of monitoring freshwater quality and resourcing global communities with clean drinking water infrastructure.

Northwestern University Earth and Planetary Sciences COHEN Graduate Service Award (2022)

Granted for contributions and service to the department through management of and mentorship in the NU-Geopaths program in Summer 2021, and participation in other justice-oriented initiatives in the Earth and Planetary Sciences Department.

FELLOWSHIPS, GRANTS & AWARDS cont.

Madeline Albright '59 Institute of Global Affairs Fellowship (2020)

3-week program of interdisciplinary lectures, resulting in giving a presentation to Secretary Madeleine Albright regarding internation issues of women's justice. Fellow profile available here.

Stanford Calderwood Prize in Public Writing (2019)

Awarded annually to exceptional student writing in the Sciences, Humanities, and Social Science nominated by instructors and selected by an oversight committee. Read the winning essay here.

Wellesley College Dorothy Thorndike '75 Fellowship (2017-18)

Fellowship in Wellesley College Botanic Gardens, aimed at connecting the community to plants, nature, and the environment. Personal work summary here (p. 12).

PUBLICATIONS

Tuccillo, M.T., Garla, S., Osburn, M.R., Nash, B.C., Axford, Y. (*in review*) Sedimentary pigments reveal complex intra-ecosystem responses of primary producers to Holocene changes in climate, mixing, and anoxia in a South Greenland lake.

Nichols, F., Pontefract, A., Masterson, A.L., Thomspon, M.L., Carr, C.E., **Tuccillo, M.T**., Osburn, M.R. (2024) Leveraging Machine Learning Approaches to Predict Organic Carbon Abundance in Mars-Analog Hypersaline Lake Sediments. JGR Machine Learning and Computation, 1(2), e2024JH000138.

CONFERENCES & ACCEPTED ABSTRACTS

(1) American Geophysical Union (AGU) Conference – Washington D.C. (2024)
   a. **Tuccillo M T,** Garla S, Osburn M R, Nash B C, Axford Y (2024) Holocene Periods of Lake Stratification, Anoxia, and Major Lake-Level Change Revealed by High-Resolution Sedimentary Pigment Analyses in a Small South Greenland Lake. (PP33D-0568)
   b. Chugh S., **Tuccillo M T**, Axford Y, Osburn M R (2024) Seasonal and Spatial Variation of δ2H in Willow (*Salix arctica*) Plant Waxes from High Arctic Greenland. (PP51F-0618)
   c. Edwards A, **Tuccillo M T**, Blair N E, Stumpf A, Grimley D A, Rhoads B L, Anders A M (2024) Soil particulate organic C inputs and burial in a Midwest USA floodplain in the watershed of an intensively managed landscape. (2EP41D-1239)

(2) Navigating the New Arctic (NNA) Conference – Washington D.C. (2023)

(3) American Geophysical Union (AGU) Conference – San Francisco, CA (2023)
   a. **Tuccillo, M.T.,** Nash, B., Puleo, P., Garla, S., Osburn, M.R., Axford, Y. (2023) A Biological Tipping Point? Sediment Accumulation Rates from a South Greenland Lake Point to an Abrupt Late Holocene Drop in Primary Productivity. (PP23D-1398)
   b. Puleo, P., Osburn, M.R., **Tuccillo, M.T.,** Douglas Akers, P.D., Kopec, B.G., Welker, J.M., Axford, Y. (2023) Developing a Proxy for Seasonality of Arctic Climate: δ18O of Seasonal Aquatic Moss Growth. (PP14B-02)

(4) Greenland Science Week (GSW) – Nuuk, Greenland (2023)

(5) American Geophysical Union (AGU) Conference – Chicago, IL (2022)
   a. van der Lee, S., Davis, T., **Tuccillo, M.T.,** Harp, R., Larocca, L., Bausch, H., Montgomery, A., Nichols, F., Savatic, K., Puleo, P., Perkins, K., Bueno, N., Woods, S., Drane, D. (2021). NU-Geopaths 1.0 Increased Awareness of and Aided the Possible Diversification of the Geosciences.

(6) ArcticNet Conference – Toronto, Ontario, Canada (2022)

(7) American Quaternary Association (AMUQA) – Madison, WI (2022)

TEACHING EXPERIENCE & PROFESSIONAL DEVELOPMENT

School of the Arts Institute - Chicago (SAIC) – Lecturer (2024)

Part-time Lecturer in Liberal Arts Department for SCIENCE-3314: Abrupt Climate Change.

Designed curriculum and taught a semester-long undergraduate course for students with a range of prior experience levels with science.

https://www.saic.edu/profiles/faculty/mia-t-tuccillo

Northwestern Prison Education Program (NU-PEP) – Coordinator & TA (2023)

Co-coordinator and course TA for EARTH-171: The Science of Fossils.

Undergraduate Teaching in STEM: MOOC CIRTL Course Completion (2022)

Course Certificate of Completion for an 8-week online course on research-backed approaches to teaching STEM in undergraduate institutions.

NU - Geopaths Academic Mentorship Training Completion (2020, 2022)
Two-session, 5-hour training for graduate students to develop better approaches for mentoring high school students in STEM (Northwestern University Geopaths Program; NSF Award # 2023263.

General Teaching Assistantships at Northwestern University
EARTH106 – The Ocean, The Atmosphere and Our Climate; *Dr. Neal E. Blair* (2021)
NU-Geopaths Summer Program- Program TA; *Dr. Suzan van der Lee* (2021)
EARTH105 – Climate Catastrophes in Earth History; *Dr. Matthew T. Hurtgen* (2022)

Guest Lecturing Experiences
2022: Community, Art and a Shifting Environment. Free educational and artmaking event hosted by OKO Exhibits at The Martin Gallery in Chicago. Delivered a lecture about climate science and social perceptions of climate change.
2023: Substitute lecture at School of the Arts Institute of Chicago (SAIC) for "SCIENCE 3003-01S: Environmental Archives of lake bed and seafloor sediments."

SCIENCE COMMUNICATION & OUTREACH

Community Science-Art Engagement in Narsaq, Greenland (2024-Present)
Supported by NSF DDRIG (Award # 2330271) and Northwestern University, and in collaboration with the Narsaq International Research Station (NIRS), Innuttaasut Illuat (community center), Klub Qaqqavaarsuk (youth club), Narsap Atuarfia (school), and Utoqqarmiuni (elders' center) in Narsaq Greenland, I organized three community art-science events:

a. Community Cyanotype Storytelling Workshop (2024)- Workshop combining storytelling through art (cyanotype prints) with our paleolimnological approach to storytelling about the environmental history of Narsaq, Greenland.
b. Youth Photography, Phytoplankton & Microscopy Workshop (2025)- Science workshop to teach a middle school class how to collect zooplankton using a plankton tow and tutorial on using microscopy to analyze samples.
c. Knowledge transfer: Microscopy & Photography from Youth to Elders (2025)- Science workshop where middle schoolers participated in showing their elders how to use a microscope to study water samples, combined with dissemination of our approach and research findings to the Narsaq elders' community.

Read more about the events: https://www.miattuccillo.com/community-outreach-greenland

Northwestern University Mentoring Opportunities for Research Engagement (MORE) (2022-2025)

Outreach Panel Coordinator & Mentor for Chicago-area High School Students
MORE is a science outreach group that holds virtual and in-person discussions with high school students about futures in academic research and careers in STEM.

SCIENCE COMMUNICATION & OUTREACH, cont.

Laboratory Tours & Interviews with Students at Northwestern Medill School of Journalism (2021-present)

Delivered laboratory tours, communicated research findings & responded to interview requests from young journalists at Northwestern University. Selected published interviews:

a. Northwestern students reconstruct past climate change records to model where the climate is heading today: https://planetforward.org/story/reconstructing-past-climate-change/
b. Bugs and bacteria: How one Northwestern lab tracks climate change: https://planetforward.org/story/bug-bacteria-climate-change/
c. Ancient Lake Sediment Reveals Millennia of Climate History and Pacing for Climate Change Now: https://www.inournaturemag.com/all/2022/10/28/ancient-lake-sediment-reveals-millenia-of-climate-history-and-pacing-for-climate-change-now

Northwestern University "NU-Geopaths" Summer Research & Mentorship Program (2021 and 2023)

High School Student Mentor proiding guidance for high school students through a self-designed research projects focused on collecting real-time environmental data and characterizing diatom algae in Lake Michigan. NU-Geopaths is supported under NSF Award # 2023263.

URGE (Unlearning Racism in Geoscience) Northwestern University Pod (2021)

Northwestern University Pod Member engaged in anti-racist curriculum to design and implement anti-racist strategies within the Northwestern Dept. of Earth & Planetary Sciences and in the field at large. URGE is supported by NSF under grants EAR-1714909 and EAR-2126109.

District 65/EvanSTEM 6th Grade Climate Action Project Mentoring Program (2021)

Graduate Student Mentor for a 6th-Grade Student.

Serving as a mentor to support a 6th grade student in completing a local Climate Action Project.

RESEARCH PROJECTS

NSF-DDRI: A Paleolimnological Investigation of Climate and Nitrogen Impacts on Primary Producers in Greenland Lakes and Community Water Supplies (2024-Present)

Co-Investigator (Co-I: Dr. Yarrow Axford, Ph.D., Northwestern University)
Characterizing Holocene ecosystem shifts of primary producers with sedimentary pigment biomarkers extracted from lake sediment cores in Narsaq, Greenland.

Targeted lakes in Greenland resemble those used for water supplies or fishing. This work centers community relationship building, collaborative science, & science education/communication.

Cyanobacterial & Algal Pigment Biomarkers in Lake Sediments of Southwest Greenland Illuminate Holocene Responses to Hydrological Changes and Stratification (2022-Present)

Graduate Student Investigator (Advisor: Dr. Yarrow Axford, Ph.D., Northwestern University)

HPLC-MS (QTOF) analysis of cyanobacterial pigments to reconstruct primary production regimes and characterize lake stratification changes through dynamics of aquatic biota (Narsarsuaq, Greenland).

Characterizing Lake Biological Responses to Permafrost Thaw Across a Discontinuous-to-Continuous Permafrost Landscape: Inuvik to Tuktoyaktuk, Northwest Territories, Canada (2023-Present)

Graduate Student Investigator (Advisor: Dr. Yarrow Axford, Ph.D., Northwestern University)

Collaboration with Dr. Andrew Medeiros, Ph.D. (Dalhousie University) and Aurora Research Institute (Inuvik, NWT, Canada).

Testing lake water for water quality/chemistry parameters and microbial-ecological communities (DNA and pigment analysis). Complementary analyses on surface sediments provide the basis for a modern calibration in a shifting environment with applications to downcore measurements from ancient sediments.

Characterizing Transport & Deposition of Organic Carbon in a Floodplain of the Upper Sangamon River, Robert Allerton Park, Monticello, IL (2020-21)

Graduate Student Investigator (Advisor: Dr. Neal E. Blair, Ph.D., Northwestern University)

Organic geochemical analysis of sources, residence time, and deposition of organic carbon in floodplains using chemical and isotopic biomarkers, in conjunction with the Critical Interface Network (CINet) and in pursuit of Ph.D. Candidacy.

Identifying the Deep Chlorophyll Maximum (DCM) in Lake Baikal's Northern Basin (2019)

Undergrad. Student Investigator (Advisor: Dr. Marianne Moore, Ph.D., Wellesley College)

Wellesley College Lake Baikal Research Program in collaboration with Irkutsk & Bolshie Koty Field Station and Irkutsk State University, Russia.

Quantifying chlorophyll & dissolved oxygen to identify a DCM in the vertical water column.

Modeling the Ecological Niche of *Alliaria petiolata* through Soil Nutrient Analysis and Statistical Frameworks (2017-2019)

Undergrad. Student Research Assistant (Advisor: Dr. Alden Griffith, Ph.D., Wellesley College).

Analytical chemistry/spectrophotometric analysis of soil nutrients and greenhouse experimentation with environmental conditions successfully modelled the

ecological niche of Garlic Mustard, an invasive plant species. Press coverage available here (p. 4). NSF Award #1655541

FIELD EXPEDITIONS

Narsaq Southwest Greenland (2025): Collection of Lakewater Data Loggers & Organization of Community Science Workshops.
Graduate Student (co-PI: Dr. Yarrow Axford, Ph.D., Northwestern University)

Narsaq & Nuuk, Southwest Greenland (2024): Collection of Lake Sediments to Investigate Primary Productivity Shifts in Arctic Lakes; Community Networking to Frame Research Questions & Build Research Partnerships.
Graduate Student (co-PI: Dr. Yarrow Axford, Ph.D., Northwestern University)

Inuvik & Tuktoyaktuk, Northwest Territories, Canada (2023): Collection of Lake Sediments and Modern Surface Waters to Investigate the Impact of Melting Permafrost on Lake Water Quality & Hydrologic Connectivity.
Graduate Student (Advisors: Dr. Yarrow Axford, Ph.D., Northwestern University; Dr. Andrew Medeiros, Ph.D., Dalhousie University).

Pituffik U.S. Airbase, Northwest Greenland (2022): Collection of Lake Sediments, Surface & Atmospheric Waters, and Plant Material for a Paleoclimate Modern Calibration Study.
Graduate Student (Advisors: Dr. Yarrow Axford, Ph.D., and Dr. Magdalena Osburn, Ph.D., Northwestern University)

Crystal Lake, Illinois, U.S.A. (2021, 2022): Lake Sediment Coring.
Graduate Student (Advisor: Dr. Yarrow Axford, Ph.D., Northwestern University)

Lake Baikal, Siberia, Russia (2019): Lake Sediment Coring, Water Sampling, Cultural Immersion (including spoken language).
Undergraduate Student (Advisors: Dr. Katrin Monecke, Ph.D., Dr. Marianne Moore, Ph.D., Dr. Thomas Hodge, Ph.D., Wellesley College, & Institute of the Earth's Crust, Irkutsk, Siberia).

Glacier National Park, Montana, U.S.A. (2017): Ecological demographic study (organism census) of an alpine desert shrub (*Smelowskia calycina*).
Undergraduate Student, Advised by Dr. Alden Griffith | Dept. Environ. Studies, Wellesley College

SCIENCE COMMUNICATION SKILLS

Grant writing, manuscript and figure drafting, public outreach about environmental science, engagement with local communities where fieldwork is conducted, merging science with art.

TEACHING & MENTORING SKILLS

Syllabus & course development, lecturing, project coaching and supervision, training mentees in laboratory techniques and mentees' college application assistance.

FIELDWORK SKILLS

Sediment coring (Universal check-valve surface percussion coring; Nesje piston coring) in lakes, plankton towing, water sampling, deployment of environmental monitors (e.g., HOBO data loggers), environmental DNA sampling.

FIELDWORK MANAGEMENT SKILLS

Flight booking and management, field safety training, safe and inclusive working environments plan development, comfortable with NSF, Polarfield Services, and Battelle systems, cargo tracking and shipping (CTS).

LAB & SCHOLARLY RESEARCH SKILLS

Microsoft Office software, Google Office software, coding in R (proficient), coding in Python (intermediate).
High Performance Liquid Chromatography (HPLC-MS) on QTOF and Triple-quad -Mass Spectrometry, GeoTEK Sediment Core Scanner, with Magnetic Susceptibility (MS), Hyper-Spectral Imaging Spectrophotometry, and X-Ray Fluorescence (XRF) Detectors, Elemental Analyzer (EA) & Isotope Ratio Mass Spectrometry (IRMS), Cuvette Spectrophotometry & Biotek Multi-mode Well Reader, Fourier Transform Infrared Reflectance (FTIR), Geochronology techniques including C-14, Pb-210, and Cs-137 radiometric chronometry.