# Allegra Tashjian

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## Overview

I use techniques from radiogenic and stable isotope geochemistry and aqueous geochemistry to study Earth surface processes, with emphases on enhanced rock weathering (ERW), climate change, and carbonate chemistry.

## Education

**Northwestern University,** Evanston, IL **Sept. 2022 - Present**
PhD Candidate, Department of Earth and Planetary Sciences, GPA 4.0
Advisor: Dr. Andrew Jacobson

**Carleton College**, Northfield, MN **Sept. 2016 - June 2020**
Bachelor of Arts in Geology, GPA: 3.57
Advisors: Drs. Mary Savina and Dan Maxbauer

## Publications

Rich, R.L., Mueller, P., Fuß, M., Gonçalves, S., Ostertag, E., Reents, S., Tang, H., **Tashjian, A.,** Thomsen, S., Kutzbach, L. Jensen, K, and Nolte, S., 2023, Design and Assessment of a Novel Approach for Ecosystem Warming Experiments in High-Energy Tidal Wetlands: Journal of Geophysical Research: Biogeosciences, v. 128, p. e2023JG007550, doi:10.1029/2023JG007550.

## Conference Presentations

Ulrich, R.N., Lucarelli, J.K., Waldeck, A.R., **Tashjian, A.**, Tarique, M., Purgstaller, B., Goetschl, K., Ni, P., Blättler, C.L., Jacobson, A.D., Tipper, E., Dietzel, M., Eagle, R., and Tripati, A.K., 2024, Cation Isotope ($\delta^{7/6}$Li, $\delta^{26/24}$Mg, and $\delta^{44/40}$Ca) and Concentration (Li/Ca, Mg/Ca) Investigations into the Transformation of Synthetic Amorphous Calcium Magnesium Carbonates (ACMC) at Different Temperatures: Abstract PP11D-0588 presented at 2024 Fall Meeting, AGU, Washington, D.C., 9-13 December.

**Tashjian, A.**, Rich, R., Jensen, K., and Nolte, S., 2022, Design and Assessment of Marsh Ecosystem Response to Increase Temperature (MERIT): an ecosystem warming experiment in a high-energy tidal wetland: Abstract GC42J-0832 presented at 2022 Fall Meeting, AGU, Chicago, IL, 12-16 December.

**Tashjian, A.**, Noyce, G., and Megonigal, J.P., 2020, Examining the Effects of Elevated Atmospheric $CO_2$ and Warming on Soil Redox Potential: Abstract 13-1 presented at Geological Society of America North Central Section Meeting, 54th, Virtual, 18-19 May.

**Tashjian, A.**, Noyce, G., and Megonigal, J.P., 2019, Climate Change in the "Wetland of the Future": Examining the Effects of Elevated Atmospheric $CO_2$ on Soil Redox Potential: Abstract 79 presented at 2019 Carleton College Student Research Symposium, Northfield, MN, 18 Oct.

## Awards and Honors

NSF Graduate Research Fellowship Program – Honorable Mention **Apr. 2024**
Northwestern Buffett Institute Conference Travel Award, **June 2023**
*Northwestern University* ($1,000)
Department of Earth and Planetary Sciences Travel Grant, **May 2023**
*Northwestern University* ($400)

The Graduate School Conference Travel Grant, *Northwestern University* ($600) **May 2023**
Mac Hyde Brownfield Scholarship Recipient (Professional award), *Minnesota Brownfields* ($2,000) **Oct. 2019**

## Research Projects

Evaluating $CO_2$ Sequestration Under Varying Climate and Fertilization Practices: A Novel Enhanced Rock Weathering Experiment **Sept. 2023 - Present**

*Graduate Student Investigator,* Northwestern University
Advised by *Dr. Andrew Jacobson, Ph.D.* | Dpt. Earth and Planetary Sciences
Combines radiogenic isotopic tracers and carbonate analyses to study mineral weathering, pedogenic carbonate formation, and $CO_2$ sequestration

Precipitation Mechanisms of Amorphous Calcium-Magnesium Carbonate Minerals **Apr. 2023 - Present**

*Research Collaborator* alongside PI *Rob Ulrich* (UCLA) and Drs. *Andrew Jacobson* (Northwestern University), *Clara Blattler* (The University of Chicago), *Anna Waldeck* (Penn State)
Project Role: High precision $\delta^{44/40}Ca$ analysis via TIMS of experimentally precipitated ACMC samples

Did the Deccan Traps Eruptions Cause Ocean Acidification? A Ca-Sr multiproxy investigation **Sept. 2022 - Present**

*Graduate Student Investigator,* Northwestern University
Advised by *Dr. Andrew Jacobson, Ph.D.* | Dpt. Earth and Planetary Sciences
Application of a Ca-Sr isotope multiproxy ($\delta^{44/40}Ca$, $\delta^{88/86}Sr$, and $^{87}Sr/^{86}Sr$) to study incidents and causes of ocean acidification before and during the Cretaceous-Paleogene boundary event

## Invited Talks

"A Ca Isotope Study of Marine Geochemistry Across the K-Pg Boundary", *EARTH310: Stable Isotope Geochemistry, Northwestern University* **Mar. 2025**

## Professional Experience

Biological Science Technician, *Smithsonian Environmental Research Center* **Aug. 2020 - Aug. 2022**

- Completed electronics prototyping for ecosystem manipulation experiments (project details here); maintained and repaired experimental infrastructure
- Developed algorithmic scripts and interactive web applications in the R programming language to analyze marine and coastal environmental data
- Proposed and led an investigation into plant-hydrology interactions at the Global Change Research Wetland (GCReW), a Chesapeake Bay tidal salt marsh

NSF REU Biogeochemistry Intern, *Smithsonian Environmental Research Center* **June 2019 - Aug. 2019**

- Conducted a research project investigating the effects of warming and increased atmospheric $CO_2$ on tidal wetland soil biogeochemistry
- Prepared reagents, analyzed porewater samples, measured soil methane flux, and collected soil cores and plant phenological data
- Used regression analysis techniques to analyze data

## Professional Development

Urbino Summer School in Paleoclimatology, *Urbino, Italy* **July 2023**
The CDR Academy, *North American Carbon Program (Virtual)* **Oct. – Dec. 2022**
National Estuarine Research Reserve Instrumentation Training, *Virtual* **May 2021**

## Teaching

Teaching Assistantships, *Northwestern University* **Sept. 2023 – Present**

- Courses: Earth System History (EARTH203); The Ocean, the Atmosphere, & Our Climate (EARTH106)
- Hold office hours and one-on-one meetings with students seeking extra assistance
- Lead and instruct weekly lab sessions
- Grade course assignments

Teaching Assistantships, *Carleton College* **Jan. 2019 - June 2020**

- Courses: Abrupt Climate Change; Paleobiology; Climate Change in Geology
- Assisted with instruction of course material, grading, and preparation of laboratory experiments for classes of 15-30 students
- Helped coordinate and participated in two lake sediment coring expeditions

## Professional Service/Outreah

Expert Screener, *CDRXIV* **Jan. 2025 – Present**
Speaker, Science with Seniors, *Northwestern University* **Aug. 2023**
Mentor, Northwestern University GeoPaths **Feb. 2023 – July 2024**

- Designs individual research project curricula for high school interns
- Provides guidance and mentoring

Co—Director, Northwestern University GeoPaths **Feb. 2023 – Aug. 2023**

- Worked alongside co-directors to recruit high school students for paid geoscience research internships
- Built annual program curricula for high school mentees and assessed program performance

Volunteer, Expanding Your Horizons Chicago **Feb. 2023**

- Assisted in outreach and fundraising to support an annual STEM symposium for middle school girls

Member, Northwestern GeoClub Outreach Division. **2022 - 2023**

- Works with graduate students to plan and organize STEM-focused volunteer opportunities in the Chicagoland area

## Skills

*Programming*: R; Python; Arduino; Bash; LoggerNet; CRBasic
*Laboratory/analytical:* Thermal ionization mass spectrometry; elemental analysis via inductively coupled plasma optical emission spectroscopy, ion chromatography, and scanning electron microscopy; wet chemistry sample preparation; column chromatography
*Design:* Adobe Illustrator; Adobe InDesign