

# Laura F. Piccirillo

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## EDUCATION

**Ph.D.**, Earth and Climate Sciences, Duke University 2024 – present  
Supervisor: Dr. Michael Kipp

**Master of Science**, Environmental Science, Memorial University of Newfoundland 2023  
Thesis: Sclerochronology of Deep-Sea Bamboo Corals from the Northwest Atlantic: *Acanella arbuscula* and *Keratoisis* spp.  
Supervisors: Dr. Evan Edinger & Dr. Meghan Burchell

**Bachelor of Science**, Geology (Honors), Biology Minor, Union College 2020  
Thesis: A Peruvian Speleothem Deposit from 25,000 to 64,000 years BP: Insight into South American Summer Monsoon Variability  
Supervisors: Dr. Donald Rodbell & Dr. David Gillikin

## RESEARCH & WORK EXPERIENCE

**Lab Technician**, Stable Isotope & Core Labs, Geosciences, Union College Dec. 2022–Aug. 2024  
Main responsibility is to operate a Delta V Advantage Isotope Ratio Mass Spectrometer with Gas Bench II, Costech Elemental Analyzer, ConFloIV, and TC/EA peripherals. Additional instrumentation learned and used includes Picarro cavity ringdown spectrometer, autotitrator, UIC auto furnace and coulometer, New Wave micro mill, and Sartorius microbalance. Prepare samples and standards for isotopic analyses, train and supervise undergraduate students, and work with the lab manager and director on scheduling and upkeep of the lab. Assist with lab research tasks for tropical paleoclimatology project using speleothems.

**Masters Graduate Research**, Environmental Science, Memorial University 2020 – 2022

**Undergraduate Senior Thesis Research**, Geosciences Dept., Union College 2019 – 2020

**Student Worker**, Stable Isotope Lab, Geosciences Dept., Union College 2016 – 2020  
Prepared samples and standards for stable isotope analysis. Assisted with cleaning, tidiness, and organization of labs, including general up-keep of lab instruments and equipment. Learned basic proficiency on a Delta V Advantage IRMS with ConFloIV, Gas Bench II, and Costech EA peripherals.

**Undergraduate Summer Research**, Geosciences Dept., Union College 2018 - 2019  
2019: Prepared speleothem samples for U-Th dating and  $\delta^{18}\text{O}$  and  $\delta^{13}\text{C}$  stable isotope analysis using a New Wave MicroMill. Conducted a literature review of other paleoclimate research on South American climate proxies.  
2018: Created an in-house standard for carbon, nitrogen, and oxygen stable isotope analysis of organic material using corn leaves.

## **PUBLICATIONS**

*In review:* **L. Piccirillo**, Edinger, E., Neves, B., Burchell, M., Layne, GD. Growth rates and ages of the small bamboo coral *Acanella arbuscula* in the Northwest Atlantic. Submitted to: Palaeogeography, Palaeoclimatology, Palaeoecology Special Issue for the 2023 International Sclerochronology Conference.

*Accepted:* E. Olson, Gillikin, DP., **Piccirillo, L.**, Verheyden, A., Forsyth, A., Litchfield, K., Stoltenberg, H., Clavel, A., Ramjohn, M., Nazir, S., Tapia, PM., Parmenter, D., and Rodbell, DT. Cave monitoring in the Peruvian Andes reveals monsoon climate preserved in speleothem calcite. Submitted to: Journal of Chemical Geology.

## **PRESENTATIONS**

Edinger E., **L. Piccirillo**, M. Burchell, O. Sherwood, S. Chen, C. Welte, M. Wertnik (2024). Laser-ablation AMS-14C measurements of bomb radiocarbon in Arctic and sub-Arctic bamboo corals in the Northwest Atlantic. Geological Society of America, Anaheim, CA, USA. *Submitted for acceptance.*

Parmenter, D., E.J. Olson, K. Velasquez, H. Stoltenberg, A. Clavel, A. Verheyden, **L. Piccirillo**, D.T. Rodbell, D.P. Gillikin, R.L. Edwards. (2023). A Multi-Proxy Speleothem Approach to Understanding the South American Monsoon System During the Last Glacial Cycle. American Geophysical Union Annual Meeting, San Francisco, CA, USA.

Gillikin, D.P., Wanamaker, A.D., Goodwin, D.H., Verheyden, A., **Piccirillo, L.**, Shirai, K. (2023). Nitrogen isotopes in macroalgae along the coast of Japan – insights into organic coastal pollution. Geological Society of America. Abstracts with Programs. Vol. 55, No. 6, doi: 10.1130/abs/2023AM-392286. Pittsburgh, PA, USA.

Olson, E., Parmenter, D., Gillikin, D.P., Stoltenberg, H., Clavel, A., **Piccirillo, L.**, Verheyden, A., Edwards, L., Rodbell, D.T. (2023). Middle Pleistocene hydroclimate changes in the tropical Andes inferred from carbon and oxygen isotope records of speleothems from Huagapo Cave, Peru. Geological Society of America. Abstracts with Programs. Vol. 55, No. 6, doi: 10.1130/abs/2023AM-394169. Pittsburgh, PA, USA.

Forsyth, A., Litchfield, K., Olson, E., Stoltenberg, H., Clavel, A., Ramjohn, M., Nazir, S., **Piccirillo, L.**, Parmenter, D., Verheyden, A., Rodbell, D.T., Gillikin, D.P. (2023). Karst hydrological control on oxygen isotope variability of cave drip water: a regional cave monitoring study from the Peruvian Andes. Geological Society of America. Abstracts with Programs. Vol. 55, No. 6, doi: 10.1130/abs/2023AM-391666. Pittsburgh, PA, USA.

**Piccirillo, L.**, E. Edinger, B. de Moura Neves, M. Burchell, G.D. Layne, S. Chen, O. Sherwood. (2023). Growth rates and ages of two deep-sea bamboo coral species from the Northwest Atlantic. Oral Speed Talk, International Symposium on Deep-Sea Corals, Edinburgh, Scotland. *Attended virtually*

Olson, E.J., D.P. Gillikin, A. Clavel, **L. Piccirillo**, S. Nazir, N. Snider, A. Verheyden, D. Parmenter, R.L. Edwards, D.T. Rodbell. (2022). Determining the source of speleothem  $\delta^{18}\text{O}$  variability from *in situ* measurements of seasonal and inter-annual isotope trends in precipitation, cave drip water and modern calcite from sites in the Central Peruvian Andes. Oral Presentation, AGU Fall Meeting, Chicago IL, USA.

- Piccirillo, L.,** E. Edinger, B. de Moura Neves, M. Burchell, G.D. Layne. (2022). Growth ring counts in deep-sea bamboo coral (*Acanella arbuscula* and *Keratoisis flexibilis*) skeletons to determine longevity and growth rates. Poster Presentation, Virtual International Sclerochronology Conference.
- Piccirillo, L.,** E. Edinger, B. de Moura Neves, M. Burchell, G.D. Layne. (2022). Using a remotely operated vehicle to study growth rates and ages in two bamboo coral species from the Northwest Atlantic and Eastern Canadian Arctic. Oral Presentation, ICES PICES Early Career Scientist Conference, St. John's NL, Canada.
- Piccirillo, L.,** E. Edinger, B. de Moura Neves, M. Burchell, G.D. Layne. (2022). Growth rates and ages in the deep-sea bamboo corals *Acanella arbuscula* and *Keratoisis* spp. from the Northwest Atlantic and Eastern Canadian Arctic. Poster Presentation, Annual Meeting of GAC-MAC-IAH-CNC-CSPG, Halifax NS, Canada.
- Piccirillo, L.,** E. Edinger, B. de Moura Neves, M. Burchell, G.D. Layne. (2022). A geographic and bathymetric comparison of growth rates and ages in the deep-sea bamboo coral *Acanella arbuscula* from the Northwest Atlantic and Eastern Canadian Arctic. Oral Presentation, 14<sup>th</sup> Annual Biology Graduate Student Symposium, Memorial University. *Virtual due to COVID-19 pandemic*
- Malayny, C., E. Edinger, B. de Moura Neves, **L. Piccirillo.** (2022). Estimating calcium carbonate production of cold-water *Primnoa resedaeformis* gorgonian coral forests on the Northeast Saglek Bank of the Labrador Sea. Oral Presentation, 14<sup>th</sup> Annual Biology Graduate Student Symposium, Memorial University. *Virtual due to COVID-19 pandemic*
- Piccirillo, L.,** M. MacKinnon, I. Predham. (2022). A Comparison of Visualization Techniques for Analyzing Microgrowth Structures in Three Species of Marine Carbonates. Poster, Annual Aldrich Interdisciplinary Conference, Memorial University. *Virtual due to COVID-19 pandemic*
- Piccirillo, L.** (2022). Sclerochronology of two species of deep-sea bamboo corals from the NW Atlantic and Eastern Canadian Arctic. Oral Presentation, Union College Intro to Oceanography Class. *Invited talk by D. Gillikin*
- Piccirillo, L.,** E. Edinger, B. de Moura Neves, M. Burchell, G.D. Layne. (2021). Habitat and growth rates of the small bamboo coral *Acanella arbuscula*. Poster, 2021 ArcticNet Annual Scientific Meeting. *Virtual due to COVID-19 pandemic*
- Parmenter, D., K. Velasquez, H. Stoltenberg, A. Clavel, **L. Piccirillo,** F.W. Cruz Sr., H. Cheng, D.T. Rodbell, D.P. Gillikin, X. Wang, A.S. Auler, X.-Y. Zheng, R. L. Edwards. (2021). South American Hydroclimate Change on Millennial and Orbital Timescales: Insights From 70,000 Year Amazon and Andes Speleothem Records. AGU Fall meeting, New Orleans LA, USA. PP21A-06.
- Piccirillo, L.** (2021). Sclerochronology of deep-sea bamboo corals in the Northwest Atlantic: *Keratoisis* spp. and *Acanella arbuscula*. Oral Presentation, CCGS Amundsen Virtual Tour for the Canada Foundation of Innovation (CFI) Board of Directors. *Invited talk by Amundsen Science*
- Piccirillo, L.** (2020). A Peruvian Speleothem Deposit from 25,000 to 64,000 years BP: Insight into South American Summer Monsoon Variability. Oral Presentation, Steinmetz Research Symposium, Union College, Schenectady NY, USA. *Virtual due to COVID-19 pandemic*

## **FIELDWORK & SEAGOING EXPERIENCE**

**Precipitation, drip-water, and speleothem collection in three caves in Peruvian Andes** 2023  
Assisted PIs, post-doctoral researcher, and undergraduate students with water collection for isotopes, trace elements, DIC, and total alkalinity.

**Research Cruise on Canadian Coast Guard scientific icebreaker (*Amundsen*)** 2021  
Participated in a four-week research cruise in the Northwest Atlantic and Eastern Canadian Arctic to collect some of MSc thesis samples. Contributed to various research objectives in a wide variety of scientific disciplines, and learned about and assisted with common scientific operations that are conducted at sea.

**Tropical Biogeochemistry Research in Bocas del Toro, Panama** 2019  
Completed a research project in 10 days focused on mangroves' ability to buffer natural ocean acidification for nearby coral reefs at the Institute for Tropical Ecology and Conservation's Bocas del Toro Biological Station. Conducted various different scientific tasks in a primarily marine environment, often working on small boats with scientific equipment.

**Caving expedition in Peru** 2019  
10-day field excursion in Huagapo cave and Pacupahuain cave, located in the Peruvian Andes to collect speleothems and atmospheric measurements for undergraduate paleoclimate thesis work. The collected speleothems from this expedition are contributing to samples used in the funded project by the National Science Foundation (\$1.5 million USD) entitled "Development of Precipitation, Evaporation and Temperature Records from Tropical Lake Sediments and Cave Deposits for the last 700,000 years" [D. Rodbell and D. Gillikin, Co-Principal Investigators].

## **AWARDS & FELLOWSHIPS**

**Moire A. Wadleigh Graduate Award for Excellence in Environmental Science** 2023  
Memorial University School of Graduate Studies (\$656 CAD). Awarded annually to the student completing the best Master of Science thesis in Environmental Science within the previous 12 months.

**Fellow of the School of Graduate Studies** 2023  
Memorial University School of Graduate Studies. Awarded to recognize continued academic excellence throughout MSc program.

**Best MSc Oral Presentation**, Biology Graduate Student Symposium (\$50 CAD) 2022

**Geology Faculty Prize** (\$600 USD) 2020  
Awarded to the senior who contributes most to the Geology Department and social morale at Union College.

**Davenport Fellowship for STEM Undergraduate Research** (\$3800 USD) 2019

**Potter Fellowship for STEM Undergraduate Research** (\$1900 USD) 2018

## **ACADEMIC ACHIEVEMENTS**

**Honors Thesis in Geology**, Union College 2020  
Successfully defended thesis to all faculty in the Geology Department at Union College.

**Dean's List**, Union College 2020

**Term Abroad**, University of Queensland, Brisbane, QLD, Australia 2018  
Studied at University of Queensland's Heron Island Research Station (Heron Island), Moreton Bay Research Station (North Stradbroke Island), Lamington National Park, and Girraween National Park.

## **TEACHING EXPERIENCE**

**Teaching Assistant**, Earth Sciences Dept., Memorial University 2022  
Undergraduate course: Earth Systems

**Teaching Assistant**, Geography Dept., Memorial University 2021  
Undergraduate course: Geographies of global change

**Teaching Assistant**, Geology Dept., Union College 2020  
Undergraduate course: Geologic perspectives on global warming

## **SOFTWARE & CODING PROFICIENCY**

Experience with data analysis and creating figures in RStudio, ArcGIS, Adobe Illustrator, ImageJ/FIJI, Microsoft Office, and all Google applications. Basic knowledge of Python.

## **CERTIFICATIONS**

PADI Open Water Diver (2020)