

Anne Gothmann, CV

I. PERSONAL

Name: **Anne M. Gothmann**

Address: St. Olaf College, 1520 St. Olaf Avenue Northfield, MN 55057

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II. EDUCATION

B.A., **Williams College**, Geosciences and Physics, *cum laude* 2006 – 2010

Ph.D., **Princeton University**, Geosciences 2010 – 2015

Advisors: Michael Bender, John Higgins

Dissertation Title: Fossil corals as archives of secular variations in seawater chemistry

Areas of Expertise/Interest: paleoclimate, climate change, biomineralization, oceanography

III. EMPLOYMENT

Assistant Professor, **St. Olaf College**, Environmental Studies and Physics 2018 – present

Courses taught at St. Olaf: Exploring the Deep (FYS 120P), Geophysics (ENVST 123), Introduction to Environmental Studies (ENVST 137), Global Climate Change (ENVST 245), Oceanography (ENVST 381), DUR: Coral Paleoclimate Proxies (ENVST 396), Analytical I (PHYS 130), Analytical II (PHYS 131), Modern Physics (PHYS 244), Analytical I Lab (PHYS 130 Lab), Principles of Physics I Lab (PHYS 124 Lab), Principles of Physics II Lab (PHYS 125 Lab)

Postdoctoral Associate, **University of Washington**, Oceanography 2015 – 2017
JISAO Postdoctoral Associate (after June 2016)

Advisor: Alexander Gagnon

Project: Developing paleoenvironmental proxies in coral for tracing changes in the global carbon cycle

IV. SCHOLARLY/ARTISTIC WORK

Publications and papers (*St. Olaf undergraduate student coauthor)

*Mottram, J., **Gothmann, A.M.**, Prokopenko, M., *Raser, R., Rollinson, V., Cordova, A., Granger, J. (in prep)
Refining the use of cold-water corals as a proxy for marine nitrogen cycling: comparison of the $\delta^{15}\text{N}$ of diet, tissue, and skeletons of *Balanophyllia elegans*.

Gothmann, A.M., Gagnon, A.C. (2021) Insight into cold-water coral biomineralization from culture experiments with decoupled carbonate chemistry parameters, *Geochimica et Cosmochimica Acta*, 315, 38-60.

Gagnon, A.C., **Gothmann, A.M.**, Branson, O., Rae, J.W.B., Stewart, J.A. (2021) The cost of resilience to ocean acidification in cold-water coral revealed by boron isotopes, *Earth and Planetary Science Letters*, 554, 116662.

*Patterson, E., *Eanes, S., *Lancrete, P., **Gothmann, A.M.**, Roback, P. (2021) Factors Controlling Coral Skeletal U/Ca Ratios with Implications for their Use as a Proxy for Past Ocean Conditions. *AJUR*, <https://doi.org/10.33697/ajur.2020.031>.

Stolarski, J., Coronado, I. Janiszewska, K., Murphy, J.G., Higgins, J.A., Kitahara, M.V., Ouatrinni, A.M., **Gothmann, A.M.**, Mazur, M., Meibom, A. (2021) A modern scleractinian coral with a two-component calcite-aragonite skeleton, *PNAS*, <https://doi.org/10.1073/pnas.2013316117>.

Gothmann, A.M., Higgins, J.A., Adkins, J.F., Broecker, W., Farley, K.A., McKeon, R., Planavsky, N., Wang, X., Stolarski, J., Bender, M.L. (2019). A Cenozoic Record of Seawater Uranium in Fossil Corals, *Geochimica et Cosmochimica Acta* 250, 173-190.

Gothmann, A.M., Higgins, J.A., Adkins, J.F., Stolarski, J. (2017) A Cenozoic record of Mg isotopes from fossil corals, *Geology* 45, 1039-1042.

Frankowiak, K., Wang, X.T., Sigman, D.M., **Gothmann, A.M.**, Kitahara, M.V., Mazur, M., Meibom, A., Stolarski, J., (2016) Photosymbiosis and the expansion of shallow-water corals, *Science Advances*, 2, e1601122.

Stolarski, J. Bosellini, F.R., Wallace, C.C., **Gothmann, A.M.**, Mazur, M., Domart-Coulon, I., Gutner-Hoch, E., Neuser, R.D., Levy, O., Shemesh, A., Meibom, A. (2016) A unique coral biomineralization pattern has resisted 40 million years of major ocean chemistry change, *Scientific Reports*, 6, 27579.

Gothmann, A.M., Higgins, J.A., Swart, P.K., Giri, S.J., Adkins, J.F., Stolarski, J., Blättler, C.L., Bender, M.L. (2016) Calcium isotopes in fossil corals: implications for coral vital effects and biomineralization through time, *Earth and Planetary Science Letters*, 444, 205-214.

Gothmann, A.M., Stolarski, J., Adkins, J.F., Schoene, B., Dennis, K.J., Schrag, D.P., Mazur, M., Bender, M.L. (2015) Fossil corals as an archive of past variations in seawater chemistry since the Mesozoic, *Geochimica et Cosmochimica Acta*, 160, 188-208.

Frankowiak, K., Mazur, M., **Gothmann, A.M.**, Stolarski, J. (2013) Diagenetic alteration of the Triassic coral from the aragonite-konservat-lagerstätte in Alakir Çay, Turkey: Implications for geochemical measurements, *Palaios*, 28, 333-342.

Presentations in the last 2 years

Invited Lectures

Gothmann, A.M. (February 9, 2021) "Fossil Corals as Archives of Past Seawater Chemistry" Pomona College, Woodford-Eckis Endowed Lecture (virtual).

Gothmann, A.M. (December 2021) “Testing controls on trace element proxies in cold-water corals cultured under decoupled carbonate chemistry conditions” Woods Hole Oceanographic Institute, Marine Chemistry and Geochemistry Seminar (virtual).

Gothmann, A.M. (October 2021) “Scanning electron microscope based tools for studying coral skeleton mineralization and alteration” Women in Astronomy and Physics Lecture Series (WaPhLs).

*Selected Conference Presentations (*denotes St. Olaf undergraduate author, **denotes undergraduate student from institutions other than St. Olaf)*

*Daniel, J., *Chan, Y., *Mottram, J., *Raser, R., Granger, J., Prokopenko, M., **Gothmann, A.** (February 2022) “Assessing the importance of starvation on the nitrogen isotope composition of cold-water coral bound organic matter” Ocean Sciences Meeting, Hawaii (Virtual).

*Mottram, J., **Gothmann, A.**, Granger, J., Prokopenko, M., *Raser, R., Rollinson, V., Cordova, A., Dobkowski, K. “Refining the use of cold-water corals as a proxy for marine nitrogen cycling through comparison of the d15N of diet, tissue and skeletons of the cold-water coral species *Balanophyllia elegans*” Ocean Sciences Meeting, Hawaii (Virtual).

*Chan, Y., *Daniel, J., *Mottram, J., *Raser, R., Granger, J., Prokopenko, M., **Gothmann, A.** “Tracing nitrogen pathways in cold water scleractinian coral using an isotope pulse labeling experiment” Ocean Sciences Meeting, Hawaii (Virtual).

** Salowey, P., *Mottram, J., **Gothmann, A.**, Granger, J., Prokopenko, M., Cordova, A. “Exploring coral-bound d15N in *Balanophyllia elegans* from Northern California tidal pools as a proxy for coastal nitrogen cycling” Ocean Sciences Meeting, Hawaii (Virtual).

Moore, S.*, **Gothmann, A.M.** (March 2020) Developing an Experimental Setup to Test Cold-Water Coral’s Ability to Record the d15N of Particulate Organic Nitrogen, The fourth conference of the Nordic Society Oikos, Reykjavik.

Honors, Awards, Grants:

EMSL-DOE, Large-Scale Research Proposal (*to be submitted March 24, 2022*). A Letter of Intent was submitted in February 2022 and EMSL has extended an invitation to submit this proposal.

EMSL-DOE, Limited Scope Proposal #60274: “Using NanoSIMS to map N distribution and uptake rates in cold-water coral skeletons”, **Principal Investigator**, (FUNDED, Awarded December 2021, for instrument time January-February 2022)

NSF-OCE “RUI: Collaborative Research: Refining the use of scleractinian cold-water coral skeleton-bound d15N as a proxy for marine N cycling”, **Principal Investigator** (FUNDED, 3/15/2020 - 1/28/2023)

NSF-EAR “MRI: Acquisition of a Variable Pressure Scanning Electron Microscope at Carleton College”,
Co-PI (FUNDED, 9/5/2018 - 9/30/2021)

JISAO Postdoctoral Fellowship, 2016-2017

Professional Memberships:

- American Geophysical Union
- Geochemical Society

Other Scholarly and Artistic Work:

- Co-editor of the Research Topic: “Biomineralization: From the Lab Bench to Paleoenvironments” [Total of 9 articles published], *Frontiers in Earth Science*.
- Session Convener for Goldschmidt Conference 2021, *Session 6f: Proxies and biomineralisation: from the lab bench to paleoenvironments*
- NSF February 2021 Proposal Evaluation Panel, Marine Geology and Geophysics
- Referee: NSF Marine Geology and Geophysics, Paleocyanography, Geobiology, *Geochimica et Cosmochimica Acta*, *Earth and Planetary Science Letters*, *Nature Communications*, *Geochemistry Geophysics Geosystems*, *ACS Earth and Space Chemistry*

V. COLLEGE AND COMMUNITY

Contributions of service and leadership to the departments

Society of Physics Students Faculty Advisor	2018-present
Participating in Physics Department, TEAM-UP Initiative	Spring 2021-present
Participated in AAPT Early Career Workshop	Summer 2021
Leading Discussion to Revise Introduction to Environmental Studies Curriculum	Fall 2021-present
Biology and Environmental Studies Tenure Track Search Committee Member	Fall 2021
Physics Department Tenure Track Search Committee Member	Fall 2019

Other contributions of service and leadership to the College

Facilitator for Common Read Discussion	Fall 2021
CURI Research Advisor	Summer 2018-2022
Buntrock Scholars Conversations Program Panelist	Spring 2020
MSCS Tenure Track Search Committee Member	Fall 2019
Faculty Chaperone, Denver Connections Trip	Spring 2019
Buntrock Scholars Group Discussion Leader	Spring 2019

Contributions to the wider community

Creating Climate Change Educational Materials for Northfield High School	Spring 2022
STEM Day, Prairie Creek Community School	2019