Megan Thompson-Munson

PhD Candidate at the University of Colorado Boulder
Pronouns: she/her/hers

metm9666@colorado.edu
megantm.github.io
github.com/MeganTM
linkedin.com/in/megantm

Education

University of Colorado — Boulder, CO
PhD in Atmospheric and Oceanic Sciences (ATOC) (GPA: 3.9/4.0) — May 2024 (expected)
Student of the Cooperative Institute for Research in Environmental Sciences (CIRES)

- Dissertation research: Ice-atmosphere interactions and ice-sheet firn processes
- Co-advisors: Jennifer Kay and Bradley Markle (2022–present); Jan Lenaerts (2020–2022)

University of Wyoming — Laramie, WY
MS in Geology (GPA: 4.0/4.0) — May 2020

- Thesis: *Observations and Implications of Three-Dimensional Deformation in the Greenland Ice Sheet*
- Advisor: Neil Humphrey

University of Massachusetts — Amherst, MA
BS in Geology; BS in Environmental Science (GPA: 3.8/4.0) — May 2017
Commonwealth Honors College Scholar with Greatest Distinction, *cum laude*

- Thesis: *Understanding the Environments in which Early Humans Lived: Insights from Organic Geochemical Analyses of East African Rift Valley Paleolakes*
- Advisor: Isla Castañeda

Fellowships

Graduate Student Research Award, CIRES, two-semester stipend — 2023–2024
Women in Quaternary Science Award, Shlemon Center for Quaternary Sciences, one-semester stipend — 2019

Publications and Presentations

Peer-Reviewed Publications

[3] **Thompson-Munson, M.**, Wever, N., Stevens, C.M., Lenaerts, J.T.M., and Medley, B. (2023). An evaluation of a physics-based firn model and a semi-empirical firn model across the Greenland Ice Sheet (1980–2020). The Cryosphere. https://doi.org/10.5194/tc-17-2185-2023

[2] Maclennan, M.L., Lenaerts, J.T.M., Shields, C.A., Hoffman, A.O., Wever, N., **Thompson-Munson, M.**, Winters, A.C., Pettit, E.C., Scambos, T.A., Wille, J.D. (2023). Climatology and Surface Impacts of Atmospheric Rivers on West Antarctica. The Cryosphere. https://doi.org/10.5194/tc-17-865-2023

[1] Lam, A., Bauer, J.E., Fraass, S., Sheffield, S., Limbeck, M.R., Borden, R.M., **Thompson-Munson, M.**, Fraass, A.J., Hills, J.M., Muskelly, C.E., Hartshorn, K.R., and Bryant, R. (2019). Time Scavengers: An Educational Website to Communicate Climate Change and Evolutionary Theory to the Public through Blogs, Web Pages, and Social Media Platforms. The Journal of STEM Outreach, 2(1). https://doi.org/10.15695/jstem/v2i1.05

Theses

[2] **Thompson-Munson, M.** (2020). Observations and implications of three-dimensional deformation in the Greenland Ice Sheet. Master's thesis, University of Wyoming.

[1] **Thompson-Munson, M.** (2017). Understanding the Environments in which Early Humans Lived: Insights from Organic Geochemical Analyses of East African Rift Valley Paleolakes. Bachelor's thesis, University of Massachusetts.

Datasets and Tools

[3] **Thompson-Munson, M.**, Wever, N., Stevens, C.M., Lenaerts, J.T.M., and Medley, B. (2023). Greenland Ice Sheet modeled firn properties from SNOWPACK and the Community Firn Model (1980–2020). Zenodo. https://doi.org/10.5281/zenodo.7671892.

[2] **Thompson-Munson, M**. SUMMEDup 2022: The SUMup Dataset Explorer. https://github.com/MeganTM/SUMMEDup2022.

[1] **Thompson-Munson, M**, Montgomery, L., Lenaerts, J.T.M., and Koenig, L. (2022). Surface Mass Balance and Snow Depth on Sea Ice Working Group (SUMup) snow density, accumulation on land ice, and snow depth on sea ice datasets 1952-2019. Arctic Data Center. doi:10.18739/A24Q7QR58.

Conference Abstracts and Presentations

* indicates invited talk

[14] **Thompson-Munson, M.**, Kay, J., and Markle, B. (2023). Characterizing the influence of idealized atmospheric forcings on firn using the SNOWPACK firn model. EGU General Assembly 2023, Vienna, Austria, 24–28 Apr 2023, EGU23-1329, https://doi.org/10.5194/egusphere-egu23-1329.

[13] Dunmire, D.R., Wever, N., Banwell, A.F., Lenaerts, J.T.M., **Thompson-Munson, M.** (2022). Future (2015-2100) Ice-Shelf Firn Air Depletion from a Statistical Firn Emulator. AGU Fall Meeting, Chicago, IL.

[12] ***Thompson-Munson, M.** (5 October 2022). Greenland Data Management: The Firn Community's Perspective. Greenland Data Workshop, Boulder, CO.

[11] **Thompson-Munson, M.**, Wever, N., Lenaerts, J.T.M., Stevens, C.M., Medley, B., and Keenan, E. (2021). Simulated and Observed Firn Properties Across the Greenland Ice Sheet. AGU Fall Meeting, online.

[10] **Thompson-Munson, M.**, Humphrey, N.F., Harper, J.T., and Meierbachtol, T.W. (2020). In-Situ Measurements of Three-Dimensional Deformation in the Greenland Ice Sheet. AGU Fall Meeting, online.

[9] Dunmire, D.R., **Thompson-Munson, M.**, Lenaerts, J., Wever, N., Keenan, E., Banwell, A.F., and Datta, R. (2020) Improving Understanding of Future Antarctic Ice-Shelf Vulnerability to Atmospheric Warming. AGU Fall Meeting, online.

[8] **Thompson-Munson, M.**, Humphrey, N.F., Harper, J.T., and Meierbachtol, T.W. (2019). Multi-day summer speed-up events in western Greenland's ablation zone driven by non-local ice sheet motion. AGU Fall Meeting, San Francisco, CA.

[7] **Thompson-Munson, M.** (2019). Evidence of cross-flow deformation in the Greenland Ice Sheet's ablation zone. Northwest Glaciologists Conference, Corvallis, OR.

[6] Castañeda, I.S., **Thompson-Munson, M.**, Gilchrist, S., Lupien, R., Russell, J.M., Salacup, J., Feibel, C.S., and Cohen, A.S. (2018). Early Pleistocene temperature history of Paleolake Lorenyang, West Turkana Basin (Kenya). AGU Fall Meeting, Washington, D.C.

[5] Lam, A.R., Bauer, J., Sheffield, S.L., Muskelly, C.E., **Thompson-Munson, M.**, Limbeck, M., Hils, J.M., Hartshorn, K.R., Fraass, A., Fraass, S., Borden, R. (2018). Time Scavengers: A Website to Disseminate Climate Change and Evolutionary Principles to Increase Public Literacy. AGU Fall Meeting, Washington, D.C.

[4] **Thompson-Munson, M**. and Castañeda, I.S. (2017). Understanding the Environments in which early humans lived: Insights from organic geochemical analyses of East African Rift Valley paleolakes. Massachusetts Undergraduate Research Conference, Amherst, MA.

[3] **Thompson-Munson, M.**, Castañeda, I.S., Lupien, R., and Russell, J.M. (2017). Evaluation the potential for isoprenoid and branched GDGT temperature reconstructions in West Turkana and Northern Awash Basin sediments. Hominin Sites and Paleolakes Drilling Project Annual Meeting, Tempe, AZ.

[2] **Thompson-Munson, M.** and Castañeda, I.S. (2015). Late Pliocene and Early Pleistocene temperature reconstructions from paleolakes of the West Turkana and North Awash basins, East Africa. GSA Annual Meeting, Baltimore, MD.

[1] Castañeda, I.S., **Thompson-Munson, M.**, Lupien, R., Russell, J.M. (2015). Late Pliocene and Early Pleistocene temperature reconstructions from paleolakes of the West Turkana and North Awash Basins, East Africa. AGU Fall Meeting, San Francisco, CA.

Reviews Performed

Earth System Science Data (1), Journal of Climate (1), Journal of Glaciology (1)

Teaching and Mentorship Experience

Teaching Positions

ATOC 1060: Our Changing Environment — University of Colorado
Teaching Assistant (57 students) — Jan–May 2023

Lead Graduate Teacher Program — University of Colorado
ATOC Lead TA — May 2022–May 2023

ATOC REU Python Bootcamp — University of Colorado
Lesson Developer and Instructor (17 students, 9 students) — Jun 2021, Jun 2022

ATOC 1070: Weather and Atmosphere Lab — University of Colorado
Teaching Assistant (64 students) — Aug–Dec 2020

GEOG 1010: Physical Geography — University of Wyoming
Teaching Assistant (60 students, 45 students) — Aug–Dec 2019, Jan–May 2020

GEOG 3600 Earth and Mineral Resources — University of Wyoming
Teaching Assistant (31 students) — Aug–Dec 2018

Research Mentorship

Ethan Glenn, CIRES Research Experience for Community College Students (RECCS) — May 2023–present
Beth Mason, BA student in ATOC at University of Colorado — Jul 2021–Apr 2022

Teaching Workshops Developed

Teaching in ATOC, University of Colorado — 14 Feb 2023
Holistic Collaboration: How to Make Networking Less Awkward, University of Colorado — 6 Feb 2023

Teaching Workshops Attended

Equitable Grading, University of Colorado — 14 Apr 2023
Inclusive Practices for Graduate Instructors, University of Colorado — 20 Feb 2023
Best Pedagogical Practices for Promoting Mental Health, University of Colorado — 17 Aug 2022
Intercultural Communication in the Classroom, University of Colorado — 17 Aug 2022
Student Engagement in the Classroom, University of Colorado — 9 May 2022
The Universal Classroom: Designing Your Course for Diverse Learners, University of Colorado — 9 May 2022
The Hidden Curriculum, University of Colorado — 9 May 2022
Teaching About Our Changing Climate, GETSI — 26 Jan 2021
Teaching in the Era of COVID-19, University of Colorado — 9 Sep 2020
Universal Design for Learning, University of Colorado — 20 Aug 2020
Using Dialogue in the Classroom, University of Colorado — 20 Aug 2020
How to Be an Anti-Racist in the Classroom, University of Colorado — 19 Aug 2020

Outreach, Service, and Other Employment

Interviews and Articles

[3] **Thompson-Munson, M.** 29 March 2021. *Icebergs.* AntarcticGlaciers.org.

http://www.antarcticglaciers.org/glacier-processes/glacier-types/icebergs/

[2] Interviewed for the article: Amos-Landgraf, I. 12 March 2021. *How Does an Iceberg Really Float?* GlacierHub. https://blogs.ei.columbia.edu/2021/03/12/iceberg-really-float/

[1] Interviewed about icebergs for *Breakfast with Sammy J* on ABC Radio Melbourne. 2 March 2021.

Outreach

Eagle Crest Elementary School, Visiting Scientist — 22, 27 Apr 2021
Colorado STEM Academy, Visiting Scientist — 9 Apr 2021
Laramie Middle School, Visiting Scientist — 5 Mar 2020
Time Scavengers Science Outreach Blog, Collaborator, Writer — 2017–2019
University of Minnesota Paleoclimate Class, Virtual Presenter — Apr 2019
Girls Inc. Eureka! STEM Career Development, Activity Developer — Jun 2015

Service

International Firn Workshop, Developer, Organizer, Junior Coordinator — Jan–Jun 2022
University of Colorado Graduate Mentorship Program, Mentor — Aug 2021–May 2022
ATOC First-Year Graduate Student Mentorship Program, Mentor — Aug 2021–May 2022
Colorado State Science Fair, Judge — 9 Apr 2021
ATOC Outreach Committee, Member, Lead — Aug 2020–May 2021
ATOC Justice, Equity, Diversity, and Inclusion Committee, Member — Aug 2020–May 2021
ATOC Forum Committee, Member — Aug 2020–May 2021
AGU Flash Freeze Competition, Judge — Dec 2010
ATOC Graduate Application Mentorship Program, Mentor, Developer — Aug–Dec 2020
Research Lunch Seminar Series, Lead and Co-Organizer — Jan 2018–Dec 2019
Wyoming State Science Fair, Judge — Mar 2018, Mar 2019
Virtual Climate Scientist Project, Ice Sheet Consultant — Dec 2018

Other Relevant Employment

Mount Rainier National Park, Geoscientists-in-the-Park Interpretative Ranger — May–Sep 2016

Field and Laboratory Experience

CIRES Snow Science Project — Boulder, CO
Lab Technician and Mentor — Oct–Nov 2022

– Mentored three undergraduate students in building a wind-shielded observation tower for measuring snow accumulation as part of a CIRES-funded project with Dr. Mark Seefeldt

Niwot Ridge Snow Science Field Work — Nederland, CO
Field Assistant (2 days) — Summer 2021

– Set up a field station containing instruments for measuring snow height and snow water equivalent

Lake Agnes Rock Glacier Field Work — State Forest State Park, CO
Field Assistant (1 day) — Oct 2019

– Hiked equipment up to a rock glacier to collect seismic refraction data in the active region of the glacier

Southern Sierra Nevada Critical Zone Observatory Field Work — Sierra Nevada, CA
Field Assistant (14 days, 11 days) — Jul 2018, Jul 2019

– Collected seismic refraction data and assisted with soil and saprolite core recovery from a Geoprobe
– Surveyed vegetation while mentoring high school students in the Hands on the Land program

Greenland Ice Sheet Field Work — Kangerlussuaq and Ilulissat, Greenland
Field Team Member (32 days, 31 days) — May–Jun 2018, May–Jun 2019

- Established first two years of a new firn project in the Greenland Ice Sheet percolation zone
- Hot-water drilled 100-m boreholes, extracted 30-m firn cores, and traveled by ski and snowmobile

University of Massachusetts Biogeochemistry Laboratory — Amherst, MA
Undergraduate Research Technician — May 2015–May 2017

- Used geochemical analyses to quantify biomarker abundances in East African Rift Valley paleolake sediments

University of Massachusetts Soil Science Laboratory — Amherst, MA
Undergraduate Research Technician — Sep–Dec 2013

- Evaluated the role of biochar in sustainable agriculture by monitoring crop yield in fields and greenhouses

Technical Skills

- **Programming Languages:** Python (excellent), Matlab (proficient), JavaScript (proficient)
- **Systems:** MacOS, Windows, Unix/Linux, high-performace computing
- **Software:** Microsoft Office, Adobe, Inkscape, LaTeX, QGIS, ArcGIS, ENVI, JMP, Git/GitHub, Jupyter Lab/Notebook, Google Colab, Google Earth Engine
- **Field Skills:** Firn coring, hot-water drilling, ground-penetrating radar, seismic refraction, rock drilling, Trimble GPS surveying, snow sampling

Awards and Scholarships

Flash Freeze Cryosphere Innovation Award for Students, AGU, $1000 — 2021
Best Graduate Student ESSS Poster, University of Colorado, $50 — 2021
AntClimNow Dataset Development and Stewardship Grant, SCAR, $2500 — 2021
EarthCube Learning Communities Fellow, EarthCube, $1000 — 2021
Fall 2020 Lab Teaching Assistant Award, University of Colorado ATOC, $250 — 2021
2020 Outstanding Master's Student, University of Wyoming Geology & Geophysics, $100 — 2021
Outstanding Student Award, Association for Women Geoscientists — 2019
Anne Kirtland Selden Lowe Scholarship, University of Wyoming, $1,500 — 2019
Page Jenkins Memorial Scholarship, University of Wyoming, $2,200 — 2019
Geology & Geophysics Meritorious Graduate Research Grant, University of Wyoming, $1,260 — 2018
Walter Harrison and Constance Chatterton Spears Fellowship, University of Wyoming, $2,500 — 2018
Bozanic Student Support, University of Wyoming, $1,000 — 2018
S H Knight Geology Scholarship, University of Wyoming, $900 — 2018
Outstanding Geology Senior Award, University of Massachusetts — 2017
Linda G. Lockwood Environmental Science Scholarship, University of Massachusetts — 2017
Education Award, AmeriCorps, $1,500 — 2016
New York Farmers Scholarship, University of Massachusetts, $1,000 — 2016
Angelo Tagliacozzo Memorial Geological Scholarship, NEAIPG, $2,000 — 2016
Ascension Farms Scholarship, University of Massachusetts, $1,000, $7,000 — 2014, 2016
Dean's Award, University of Massachusetts, $2,000 — 2013–2016
John & Abigail Adams Tuition Waiver, University of Massachusetts — 2013–2016

Organizations

European Geosciences Union, Student Member — 2022–present
American Geophysical Union, Student Member — 2019–2021
Association for Women Geoscientists, Student Member — 2019
American Institute of Professional Geologists, Student Member — 2017

Phi Kappa Phi, Student Member 2017
University of Massachusetts Geosciences Club, Vice President 2015–2017
Phi Sigma Pi, Student Member, Education Chair, Regional Delegate 2014–2017
Geological Society of America, Student Member 2014–2017