Lizz Ultee, PhD

Research Roles

2024 –	**NASA Goddard Space Flight Center** Associate Research Scientist, Cryospheric Sciences Lab. GESTAR-II Cooperative Agreement with Morgan State University.
2021–2024	**Middlebury College** Assistant Professor, Department of Earth & Climate Sciences.
2021	**Georgia Tech** Postdoctoral Fellow, School of Earth & Atmospheric Sciences.
2018–2021	**Massachusetts Institute of Technology** Postdoctoral Associate, Dept. of Earth, Atmospheric, & Planetary Sciences.
2014–2018	**University of Michigan** Ph.D., Climate & Space Sciences. *Dissertation:* Constraints on the dynamic contribution to 21st-century sea level rise from Greenland outlet glaciers
2009–2013	**Queen's University** B.Sc.Hons., Specialist in Mathematical Physics. *Thesis:* Energy conditions with nonzero cosmological constant λ
2011	**University of Toronto** Summer researcher, Centre for Global Change Science.

Peer-Reviewed Research

Student and undergraduate student† coauthors indicated.*

19. **Ultee, L.**, Wimberly, F.†, Coats, S., Mackay, J. and Holmgren, E.* (2026). 'CMIP6 climate model spread outweighs glacier model spread in 21st-century drought buffering projections.' *The Cryosphere* 20: 1339-1361. doi: 10.5194/tc-20-1339-2026

18. Verjans, V., Robel, A.A., **Ultee, L.**, Seroussi, H., Thompson, A., Ackerman, L., Choi, Y., and Krebs-Kanzow, U. (2025). 'The Greenland Ice Sheet Large Ensemble (GrISLENS): Simulating the future of Greenland under climate variability.' *The Cryosphere* 19: 3749-3789. doi: 10.5194/tc-19-3749-2025

17. Schuster, L.*, Maussion, F., Rounce, D., **Ultee, L.**, Schmitt, P.*, Lacroix, P., Frölicher, T., and Schleussner, C.-F. (2025). 'Irreversible glacier change and trough water for centuries after overshooting 1.5° C.' *Nature Climate Change*. doi: 10.1038/s41558-025-02318-w

16. Wimberly, F.†, **Ultee, L.**, Schuster, L.*, Huss, M., Rounce, D. R., Maussion, F., Coats, S., Mackay, J., and Holmgren, E.* (2025). 'Inter-model differences in 21st Century glacier runoff for the world's major river basins.' *The Cryosphere*. doi: 10.5194/tc-19-1491-2025

✉ elizabeth.ultee@morgan.edu ehultee.github.io

15. Aguayo, R.*, Maussion, F., Schuster, L.*, Schaefer, M., Caro, A., Schmitt, P.*, Mackay, J., **Ultee, L.**, Leon-Muñoz, J., and Aguayo, M. (2024). 'Unravelling the sources of uncertainty in glacier runoff projections in the Patagonian Andes (40–56° S)'. *The Cryosphere* 18: 5383–5406. doi: 10.5194/tc-18-5383-2024

14. Robel, A., **Ultee, L.**, Ranganathan, M, and Nash, M. (2024). 'For whom and by whom is glaciology?' *Journal of Glaciology*. doi: 10.1017/jog.2024.29

13. Hanna, E., Topál, D., ..., and **Ultee, L.** (2024). 'Short- and long-term variability of the Antarctic and Greenland ice sheets.' *Nature Reviews Earth & Environment*. doi: 10.1038/s43017-023-00509-7

12. **Ultee, L.**, Robel, A., and Castruccio, S. (2024). 'A stochastic parameterization of ice sheet surface mass balance for the Stochastic Ice-Sheet and Sea-Level System Model (StISSM v1.0).' *Geoscientific Model Development* 17: 1041-1057. doi: 10.5194/gmd-17-1041-2024

11. Malles, J.-H.*, Maussion, F., **Ultee, L.**, Kochtitzky, W.*, Copland, L., and Marzeion, B. (2023). 'Exploring the impact of a frontal ablation parameterization on projected 21st-century mass change for Northern Hemisphere glaciers.' *Journal of Glaciology* 69(277): 1317-1332. doi: 10.1017/jog.2023.19.

10. Verjans, V., Robel, A., Seroussi, H., **Ultee, L.**, and Thompson, A. (2022). 'The Stochastic Ice-Sheet and Sea-Level System Model v1.0 (StISSM v1.0).' *Geoscientific Model Development* 15: 8269–8293. doi: 10.5194/egusphere-2022-699

9. **Ultee, L.**, Felikson, D., Minchew, B., Stearns, L. A., and Riel, B. (2022). 'Helheim Glacier ice velocity variability responds to runoff and terminus position change at different timescales.' *Nature Communications* 13: 6022. doi: 10.1038/s41467-022-33292-y

8. **Ultee, L.**, Coats, S., and Mackay, J. (2022) 'Glacial runoff buffers drought through the 21st century.' *Earth System Dynamics* 13: 935-959. doi: 10.5194/esd-13-935-2022

7. **Ultee, L.** and Bassis, J. N. (2020). 'SERMeQ model produces a realistic upper bound on calving retreat for 155 Greenland outlet glaciers.' *Geophysical Research Letters* 47(21). doi: 10.1029/2020GL090213

6. **Ultee, L.**, Meyer, C.R., and Minchew, B. M (2020). 'Tensile strength of glacial ice deduced from observations of 2015 collapse of Eastern Skaftá Cauldron, Vatnajökull Ice Cap, Iceland.' *Journal of Glaciology* 66(260): 1024–1033. doi: 10.1017/jog.2020.65

5. Bassis, J. N. and **Ultee, L.** (2019). 'A thin film viscoplastic model for calving glaciers: an upper bound on calving retreat.' *Journal of Geophysical Research: Earth Surface.* 124: 2036–2055. doi: 10.1029/2019JF005160

4. **Ultee, L.**, Arnott, J. C., Bassis, J. N., and Lemos, M. C. (2018). 'From ice sheets to main streets: Intermediaries connect climate scientists to coastal adaptation.' *Earth's Future* 6(3): 299–304. doi: 10.1002/2018EF000827

3. Boone, L., **Ultee, L.**, Waisanen, E., Newell, J., Thorne, J. A.†, and Hardin, R. (2018). 'Collaborative creation and implementation of a Michigan Sustainability Case on urban farming in Detroit.' *Case Studies in the Environment* 2(1): 1–13. doi: 10.1525/cse.2017.000703

2. **Ultee, L.** and Bassis, J. N. (2017). 'A plastic network approach to model calving glacier advance and retreat.' *Frontiers in Earth Sciences* 5(24). doi:10.3389/feart.2017.00024.

1. **Ultee, L.** and Bassis, J. N. (2016). 'The future is Nye: an extension of the perfect plastic approximation to tidewater glaciers.' *Journal of Glaciology* 62(236): 1143–1152. doi:10.1017/jog.2016.108.

In Review

Yang, R., **Ultee, L.**, Aalstad, K., Debolskiy, M. V., Hock, R., Schmitt, P., Rounce, D., and Li, T. (in review for *Geoscientific Model Development*, 2026). 'Joint Bayesian Calibration of Frontal Ablation and Surface Mass Balance in Global Glacier Models.' *EGUsphere* preprint: doi: 10.5194/egusphere-2026-1081

Jenson, A. J., ... and **Ultee, L.** (in review for *Geophysical Research Letters*, 2026). 'Seasonal velocity variations of fast-flowing outlet glaciers in coupled ice-hydrology simulations.'

Invited Works

Ultee, L. (2025). 'How does glacier flow vary by season?' *Science* 390 (6776): 886. doi: 10.1126/science.aec7025

Ultee, L., Carey, M., Sugiyama, S., and Young, T. J. (in review). 'A framework for modern glaciology.' In R. Carr and C. Batchelor (Eds.), *Handbook for Glacial Environments*. Routledge: forthcoming.

Awards & Honours

Research awards	International Glaciological Society - Early Career Scientist Award (2021)
	Michigan Sustainability Cases IMPACT Award (2018)
Service awards	MIT School of Science Spot Award (2020)

Funding

Funded, Lead PI	'Collaborative Research: Disentangling runoff- and terminus-driven velocity variations of fast flowing outlet glaciers', NSF OPP, $944,000 ($227,000 to Middlebury/Morgan State). *Inst. PIs: Martin Truffer (UAF) & Jason Amundson (U Alaska Southeast).*
Funded Collaborator	'Global glacier modeling: Do non-linear feedbacks matter for century-scale projections?', Research Council of Norway. *PI: Regine Hock (U. Oslo).*
Internal support	NASA Sea Level Change Team (ongoing task at GESTAR) Middlebury student research grants (Total $24,000) UMich conference organizing funds (Total $20,000)

Select Invited Presentations

'Future glacial water resources in a changing climate.' Earth & Environmental Sciences Seminar at University of Pennsylvania, Philadelphia, PA, USA. (2025)

'Greenland ice sheet variability and its implications for sea-level projections.' Geophysics Seminar at UT Institute for Geophysics, Austin, TX, USA. (2025)

'Glacier effects on future water resources at local to global scale.' Geosciences Seminar at University of Arizona, Tucson, AZ, USA. (2025)

'Global glacier models agree on 21st century runoff and drought metrics at river basin scale.' *American Geophysical Union Fall Meeting 2024*, Washington, DC, USA. (2024)

'Evidence-based practices for community-oriented cryospheric science.' *American Geophysical Union Fall Meeting 2024*, Washington, DC, USA. (2024)

'Can we count on glacial runoff through the 21st century?' *International Union of Geodesy and Geophysics*, Berlin, Germany. (2023)

'A global analysis of glacial drought buffering through the 21st century.' Geoscience Seminar at Williams College, Williamstown, MA. (2023)

" " CryoHydro Seminar at University of Oslo, Oslo, Norway. (2023)

" " Earth & Atmospheric Sciences Seminar at Georgia Tech, Atlanta, GA. (2022)

'Mathematical avenues to climate science.' Mathematics Colloquium at Queen's University, Kingston, ON, Canada. (2022)

'A stochastic approach to ice sheet surface mass balance for sea-level forecasting.' *American Geophysical Union Fall Meeting 2021*, New Orleans, LA, USA. (2021).

" " Utrecht University IMAU Colloquium, Utrecht, Netherlands. (2021)

" " NASA GISS Sea Level Seminar. (2021)

'An upper bound on 21st century outlet glacier retreat.' IceFlow Seminar at University of Copenhagen. (2020)

'Simulating 21st century iceberg calving from the Greenland Ice Sheet with SERMeQ.' Interagency Arctic Research Policy Committee's Glaciers and Sea Level Team meeting. (2019)

'Fractura del hielo glaciar y su contribución al nivel del mar *(Fracture of glacier ice and how it contributes to global sea level)*.' Public lecture given in Spanish at Universidad Nacional de Ingeniería, Lima, Peru. (2019)

Field experience & Relevant training

Sept. 2025	**Sermeq Kujalleq dynamic drivers – recovery**	
	US National Science Foundation	Ilulissat, Greenland
	Recovered instruments from the Greenland Ice Sheet by helicopter. Worked around crevasse hazard in roped team. Serviced time-lapse cameras near glacier front. Managed entire project including team configuration, helicopter route planning, cargo, safety planning, permitting, and winter storage. *PI: Lizz Ultee*.	
May 2025	**Sermeq Kujalleq dynamic drivers – install**	
	US National Science Foundation	Ilulissat, Greenland
	Installed 12 stations of GNSS and meteorological instruments on the surface of the Greenland Ice Sheet. Serviced time-lapse cameras near glacier front. *PI: Lizz Ultee*.	
Apr. 2024	**Sermeq Kujalleq dynamic drivers – logistics misadventures**	
	US National Science Foundation	Ilulissat, Greenland
	Planned helicopter deployment of GNSS and meteorological instruments on the surface of the Greenland Ice Sheet. Revised field plans due to inclement weather and transit difficulties. Installed time-lapse cameras to observe glacier calving front and ice melange in fjord. *PI: Lizz Ultee*.	

Aug. 2023	**Sholes Glacier mass balance**	
	North Cascade Glacier Climate Project	Mt. Baker, WA
	Surveyed snowpack with hand-held probe, installed ablation stakes using hand-powered Kovacs ice auger, measured proglacial streamflow with dye tracing and depth cross-sections. Practiced mountaineering skills. Self-supported camp in a wilderness area — backpacked in all supplies for 6 days. *PI: Mauri Pelto (Nichols College)*.	
Sept. 2022	**Project COEBELI**	
	Swiss National Science Foundation	Ilulissat, Greenland
	Recovered instruments from the Greenland Ice Sheet by helicopter. Serviced ice-adjacent instruments including tide gauge and broadband seismometer. Maintained, inventoried, and packed instruments for shipping to Switzerland. Received training in Greenland field logistics. *PI: Martin Lüthi (U. Zurich)*.	

Wilderness First Aid	SOLO (certified through 2024)
Mental Health First Aid	MHFA USA (certified through 2025)
Crevasse rescue	Ice Journey, Iceland (2022); Petra Cliffs, Vermont (2025)
Ice climbing	Petra Cliffs, Vermont (2023-present)
Polar risk management	US National Science Foundation (*workshop co-organizer*, 2021); Polar Field Services (2024-present)

Professional engagement & Service

Model intercomparison	Ice Sheet Model Intercomparison Project phase 7 (2024 -)
UNFCCC Observer	Civil society delegate, COP21 Paris climate negotiations (2015)
NOAA Climate Process Team	Iceberg calving in climate models (2014-2016)
Open Science support	AGU session convener, 'Community tools and products for cryosphere discovery and application' (2021-2023) Hackathon advisor, GeoLatinas 'GeoHackeo' (2020)
Reviewer	IPCC Special Report on Oceans & Cryosphere in a Changing Climate; NASA Cryosphere & Physical Oceanography sections; NSF Office of Polar Programs; Natural Sciences and Engineering Research Council (Canada); Natural Environment Research Council (UK); Journals inc. *Nature*, *Geophysical Research Letters*, *Global Environmental Change*, *The Cryosphere*, *Frontiers in Earth Sciences*, *Geoscientific Model Development*, *Journal of Advances in Modeling of the Earth System*, *Water Resources Research*, *Journal of Hydrology*

Peer-Reviewed Public Teaching Materials

Ultee, L. and Maussion, F. (2022). 'OGGM-Edu Glaciology Lab 1: What Makes a Glacier?' In: *On the Cutting Edge Exemplary Teaching Activities* collection, Science Education Resource Center (SERC), Carleton, MN. serc.carleton.edu/teachearth/activities/250452.html

Ultee, L. and Maussion, F. (2022). 'OGGM-Edu Glaciology Lab 2: Exploring glacier data.' SERC, Carleton, MN. serc.carleton.edu/teachearth/activities/250446.html

Ultee, L. and Maussion, F. (2024). 'OGGM-Edu Glaciology Lab 3: Simulating glacier flow.' SERC, Carleton, MN. serc.carleton.edu/teachearth/activities/281855.html

Teaching & Supervision Experience

Research advising
1 University of Oslo postdoctoral scholar
1 University of Alaska Fairbanks Ph.D. student
10 Middlebury College undergraduate students (2 thesis + 8 assistant)
2 MIT undergraduate students
1 Universidad Nacional Federico Villarreal undergraduate (bachillerato)

Thesis examiner
1 Simon Fraser University M.Sc.

Course instructor

ECSC 392 - Modern Climate Seminar
Undergrad seminar focused on current climate lit., esp. National Climate Assessment. Middlebury, 3 hr weekly seminar.

ECSC 362 - Glaciology
Upper-level undergrad elective in ice dynamics & consequences of glacier change. Middlebury, 3 hr lecture + 3 hr lab weekly.

ECSC 202 - Climate Dynamics
Undergrad course on energy balance, circulation, and quant. methods of Earth Science. Middlebury, 3 hr lecture + 3 hr lab weekly.

ECSC 111 - Natural Hazards
Introductory course on mechanisms & social considerations behind hazard phenomena. Middlebury, 3 hr weekly lecture.

CLIMATE 405 - Knowing Climate Change
Community-engaged course for climate literacy. Partner org: EDGI. UMich Residential College, 3 hr weekly seminar.

Clubes de Ciencia - Glaciología y recursos hídricos
Spanish-language glaciology research workshop (40 hr) in Lima, Peru.

Public Engagement & Media

2025
- Museum residency at ILLU Science & Art Hub, Ilulissat
- School visits at Atuarfik Matthias Storch and Atuarfik Jørgen Brønlund, Ilulissat
- Career development talk for Young Water Professionals Perú

2024
- "The world's glaciers are melting faster than we thought." *National Geographic* article
- "Antarctic ice loss is significant, contrary to claims." FactCheck article
- "For whom, and by whom, is glaciology?" AntarcticGlaciers guest post

2023-
- Lead investigator, Museum of the North special exhibit development

2022
- Academic partner, National Weather Service Burlington office

2021
- "Defining climate leadership" workshop leader for AIESEC UK

2019
- International instructor, Clubes de Ciencia Peru

2018
- "Web Monitoring in the Classroom Builds Information Literacy, Civic Engagement." Environmental Data & Governance Initiative blog post
- "Knowing Climate Change: A Student Panel on Accountability and Accessibility." Student radio broadcast (archived)
- Panelist, Michigan Institute for Social Change

2017
- Participant, APECS Polar Science Communication workshop

2016
- "What is Community-Engaged Glaciology?" Guest workshop facilitated at International Summer School in Glaciology
- Developed instructional case study and podcast about Detroit urban farming (related radio broadcast)
- "Good COP, Bad COP: Bringing the Paris Climate Talks Back to Ann Arbor." Event organizer and presenter

2015
- "City Limits To Climate Change: Climate Justice from Neighborhoods to Negotiations." *It's Hot in Here* podcast.
- Fellow, Michigan Engaged Pedagogy Initiative

Further Skills

Languages English (*fluent*), Dutch (*fluent*), Spanish (*good*), German (*fair*), French (*fair*)

✉ ELIZABETH.ULTEE@MORGAN.EDU EHULTEE.GITHUB.IO