

# LIZZ ULTEE, PHD

## RESEARCH ROLES

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

## INVITED WORKS

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

## PEER-REVIEWED RESEARCH

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*Student\* and undergraduate student† coauthors indicated.*

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.<sup>†</sup>, **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
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.<sup>†</sup>, 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

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**Ultee, L.**, Wimberly, F.<sup>†</sup>, Coats, S., Mackay, J. and Holmgren, E.\* (in review for *The Cryosphere*). ‘Climate model spread outweighs glacier model spread in 21st-century drought buffering projections.’ *EGUsphere* preprint: doi: 10.5194/egusphere-2025-3965

**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

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

## FUNDING

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<b>Funded, Lead PI</b>	‘Collaborative Research: Disentangling runoff- and terminus-driven velocity variations of fast flowing outlet glaciers’, NSF OPP, \$944,000 (\$227,000 to Middlebury/Morgan State). <i>Inst. PIs: Martin Truffer (UAF) &amp; Jason Amundson (U Alaska Southeast).</i>
<b>Funded Collaborator</b>	‘Global glacier modeling: Do non-linear feedbacks matter for century-scale projections?’, Research Council of Norway. <i>PI: Regine Hock (U. Oslo).</i>
<b>Internal support</b>	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

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‘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)

‘21st century glacier change: from dynamics to downstream impacts.’ Research Seminar at Atmospheric & Environmental Research, Inc., Lexington, MA, 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

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SEPT. 2025	<b>Sermeq Kujalleq dynamic drivers – recovery</b>	
	US National Science Foundation	Ilulissat, Greenland
Recovered instruments from the Greenland Ice Sheet by helicopter. Managed crevasse hazard working 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. <i>PI: Lizz Ultee.</i>		

MAY 2025	<b>Sermeq Kujalleq dynamic drivers – install</b>	
	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. <i>PI: Lizz Ultee.</i>		

APR. 2024	<b>Sermeq Kujalleq dynamic drivers – character-building (failed install)</b>	
	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. Installed time-lapse cameras to observe glacier calving front and ice melange in fjord. <i>PI: Lizz Ultee.</i>		

AUG. 2023	<b>Sholes Glacier mass balance</b>	
	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. <i>PI: Mauri Pelto (Nichols College).</i>		

SEPT. 2022	<b>Project COEBELI</b>	
	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. <i>PI: Martin Lüthi (U. Zurich).</i>		

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

## PROFESSIONAL ENGAGEMENT & SERVICE

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<b>Model intercomparison</b>	Ice Sheet Model Intercomparison Project phase 7 (2024 -)
<b>UNFCCC Observer</b>	Civil society delegate, COP21 Paris climate negotiations (2015)
<b>NOAA Climate Process Team</b>	Iceberg calving in climate models (2014-2016)
<b>Open Science support</b>	AGU session convener, 'Community tools and products for cryosphere discovery and application' (2021-2023) Hackathon advisor, GeoLatinas 'GeoHackeo' (2020)
<b>Reviewer</b>	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. <i>Nature</i> , <i>Geophysical Research Letters</i> , <i>Global Environmental Change</i> , <i>The Cryosphere</i> , <i>Frontiers in Earth Sciences</i> , <i>Geoscientific Model Development</i> , <i>Journal of Advances in Modeling of the Earth System</i> , <i>Water Resources Research</i> , <i>Journal of Hydrology</i>

## PEER-REVIEWED PUBLIC TEACHING MATERIALS

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**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](http://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](http://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](http://serc.carleton.edu/teachearth/activities/281855.html)

## TEACHING & SUPERVISION EXPERIENCE

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<b>Research advising</b>	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)
<b>Thesis examiner</b>	1 Simon Fraser University M.Sc.
<b>Course instructor</b>	<b><i>ECSC 392 - Modern Climate Seminar</i></b> Undergrad seminar focused on current climate lit., esp. National Climate Assessment. Middlebury, 3 hr weekly seminar. <b><i>ECSC 362 - Glaciology</i></b> Upper-level undergrad elective in ice dynamics & consequences of glacier change. Middlebury, 3 hr lecture + 3 hr lab weekly. <b><i>ECSC 202 - Climate Dynamics</i></b> Undergrad course on energy balance, circulation, and quant. methods of Earth Science. Middlebury, 3 hr lecture + 3 hr lab weekly. <b><i>ECSC 111 - Natural Hazards</i></b> Introductory course on mechanisms & social considerations behind hazard phenomena. Middlebury, 3 hr weekly lecture. <b><i>CLIMATE 405 - Knowing Climate Change</i></b> Community-engaged course for climate literacy. Partner org: EDGI. UMich Residential College, 3 hr weekly seminar. <b><i>Clubes de Ciencia - Glaciología y recursos hídricos</i></b> Spanish-language glaciology research workshop (40 hr) in Lima, Peru.

## PUBLIC ENGAGEMENT & MEDIA

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- 2025
  - Museum residency at ILLU Science & Art Hub, Ilulissat
  - School visits at Atuarfik Matthias Storch and Atuarfik Jørgen Brønlund, Ilulissat
- 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-
- 2022
  - Lead investigator, Museum of the North special exhibit development
- 2021
  - 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

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