

Christopher “Max” Stevens

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(i) Professional Preparation:

- Ph.D., University of Washington, Earth and Space Sciences, 2018. Advisor: Edwin D. Waddington
 - o Dissertation: *Investigations of physical processes in polar firn through modeling and field measurements.*
- B.A., Colorado College, Physics and Mathematics, 2005.

(ii) Appointments:

- **Assistant Research Scientist**, University of Maryland, College Park, Earth System Science Interdisciplinary Center, 2020-present.
- **Assistant Research Scientist**, NASA Goddard Space Flight Center Cryospheric Sciences Laboratory, 2020-present.
- **Research Physical Scientist**, U.S. Geological Survey, Northern Rocky Mountain Science Center, 2021-2024.
- **Postdoctoral fellow**, University of Washington, Earth and Space Sciences, 2018-2020.

(iii) Peer-reviewed Publications:

1. **Stevens, C. M.**, Sass, L., Florentine, C., McNeil, C., Baker, E., and Bollen, K.: Direct measurements of firn-density evolution from 2016 to 2022 at Wolverine Glacier, Alaska, *Journal of Glaciology*, 1–11, <https://doi.org/10.1017/jog.2024.24>, 2024.
2. Dattler, M. E., Medley, B., and **Stevens, C. M.**: A physics-based Antarctic melt detection technique: combining Advanced Microwave Scanning Radiometer 2, radiative-transfer modeling, and firn modeling, *The Cryosphere*, 18, 3613–3631, <https://doi.org/10.5194/tc-18-3613-2024>, 2024.
3. The Firn Symposium team: Firn on ice sheets, *Nat Rev Earth Environ*, 5, 79–99, <https://doi.org/10.1038/s43017-023-00507-9>, 2024.
4. **Stevens, C. M.**, Lilien, D. A., Conway, H., Fudge, T. J., Koutnik, M. R., and Waddington, E. D.: A new model of dry firn-densification constrained by continuous strain measurements near South Pole, *Journal of Glaciology*, 1–15, <https://doi.org/10.1017/jog.2023.87>, 2023.
5. Ryan, J. C., Medley, B., **Stevens, C. M.**, Sutterley, T. C., and Siegfried, M. R.: Role of Snowfall Versus Air Temperatures for Greenland Ice Sheet Melt-Albedo Feedbacks, *Earth and Space Science*, 10, e2023EA003158, <https://doi.org/10.1029/2023EA003158>, 2023.
6. Thompson-Munson, M., Wever, N., **Stevens, C. M.**, Lenaerts, J. T. M., and Medley, B.: An evaluation of a physics-based firn model and a semi-empirical firn model across the Greenland Ice Sheet (1980–2020), *The Cryosphere*, 17, 2185–2209, <https://doi.org/10.5194/tc-17-2185-2023>, 2023.
7. Jones, T. R., Cuffey, K. M., Roberts, W. H. G., Markle, B. R., Steig, E. J., **Stevens, C. M.**, Valdes, P. J., Fudge, T. J., Sigl, M., Hughes, A. G., Morris, V., Vaughn, B. H., Garland, J., Vinther, B. M., Rozmiarek, K. S., Brashear, C. A., and White, J. W. C.: Seasonal temperatures in West Antarctica during the Holocene, *Nature*, 613, 292–297, <https://doi.org/10.1038/s41586-022-05411-8>, 2023.
8. Medley, B., Neumann, T. A., Zwally, H. J., Smith, B. E., and **Stevens, C. M.**: Simulations of firn processes over the Greenland and Antarctic ice sheets: 1980–2021, *The Cryosphere*, 16, 3971–4011, <https://doi.org/10.5194/tc-16-3971-2022>, 2022.
9. MacFerrin, M. J., **Stevens, C. M.**, Vandecrux, B., Waddington, E. D., and Abdalati, W.: The Greenland Firn Compaction Verification and Reconnaissance (FirnCover) dataset, 2013–2019, *Earth System Science Data*, 14, 955–971, <https://doi.org/10.5194/essd-14-955-2022>, 2022.

10. Kahle, E. C., Steig, E. J., Jones, T. R., Fudge, T. J., Koutnik, M. R., Morris, V. A., Vaughn, B. H., Schauer, A. J., **Stevens, C. M.**, Conway, H., Waddington, E. D., Buizert, C., Epifanio, J., and White, J. W. C.: Reconstruction of Temperature, Accumulation Rate, and Layer Thinning From an Ice Core at South Pole, Using a Statistical Inverse Method, *JGR Atmospheres*, 126, e2020JD033300, <https://doi.org/10.1029/2020JD033300>, 2021.
11. Verjans, V., Leeson, A. A., McMillan, M., **Stevens, C. M.**, Van Wessem, J. M., Van De Berg, W. J., Van Den Broeke, M. R., Kittel, C., Amory, C., Fettweis, X., Hansen, N., Boberg, F., and Mottram, R.: Uncertainty in East Antarctic Firn Thickness Constrained Using a Model Ensemble Approach, *Geophysical Research Letters*, 48, e2020GL092060, <https://doi.org/10.1029/2020GL092060>, 2021.
12. Horlings, A. N., Christianson, K., Holschuh, N., **Stevens, C. M.**, and Waddington, E. D.: Effect of horizontal divergence on estimates of firn-air content, *Journal of Glaciology*, 67, 287–296, <https://doi.org/10.1017/jog.2020.105>, 2021.
13. Gkinis, V., Holme, C., Kahle, E. C., **Stevens, C. M.**, Steig, E. J., and Vinther, B. M.: Numerical experiments on firn isotope diffusion with the Community Firn Model, *J. Glaciol.*, 67, 450–472, <https://doi.org/10.1017/jog.2021.1>, 2021.
14. Hawley, R. L., Neumann, T. A., **Stevens, C. M.**, Brunt, K. M., and Sutterley, T. C.: Greenland Ice Sheet Elevation Change: Direct Observation of Process and Attribution at Summit, *Geophysical Research Letters*, 47, e2020GL088864, <https://doi.org/10.1029/2020GL088864>, 2020.
15. Vandecrux, B., Mottram, R., Langen, P. L., Fausto, R. S., Olesen, M., **Stevens, C. M.**, Verjans, V., Leeson, A., Ligtenberg, S., Kuipers Munneke, P., Marchenko, S., Van Pelt, W., Meyer, C., Simonsen, S. B., Heilig, A., Samimi, S., Machguth, H., MacFerrin, M., Niwano, M., Miller, O., Voss, C. I., and Box, J. E.: The firn meltwater Retention Model Intercomparison Project (RetMIP): Evaluation of nine firn models at four weather station sites on the Greenland ice sheet, *Ice sheets/Greenland*, <https://doi.org/10.5194/tc-2019-331>, 2020.
16. **Stevens, C. M.**, Verjans, V., Lundin, J. M. D., Kahle, E. C., Horlings, A. N., Horlings, B. I., and Waddington, E. D.: The Community Firn Model (CFM) v1.0, *Geosci. Model Dev.*, 13, 4355–4377, <https://doi.org/10.5194/gmd-13-4355-2020>, 2020.
17. Verjans, V., Leeson, A. A., Nemeth, C., **Stevens, C. M.**, Kuipers Munneke, P., Noël, B., and Van Wessem, J. M.: Bayesian calibration of firn densification models, *The Cryosphere*, 14, 3017–3032, <https://doi.org/10.5194/tc-14-3017-2020>, 2020.
18. Hughes, A. G., Jones, T. R., Vinther, B. M., Gkinis, V., **Stevens, C. M.**, Morris, V., Vaughn, B. H., Holme, C., Markle, B. R., and White, J. W. C.: High-frequency climate variability in the Holocene from a coastal-dome ice core in east-central Greenland, *Clim. Past*, 16, 1369–1386, <https://doi.org/10.5194/cp-16-1369-2020>, 2020.
19. Fudge, T. J., Lilien, D. A., Koutnik, M., Conway, H., **Stevens, C. M.**, Waddington, E. D., Steig, E. J., Schauer, A. J., and Holschuh, N.: Advection and non-climate impacts on the South Pole Ice Core, *Clim. Past*, 16, 819–832, <https://doi.org/10.5194/cp-16-819-2020>, 2020.
20. Heilig, A., Eisen, O., Schneebeli, M., MacFerrin, M., **Stevens, C. M.**, Vandecrux, B., and Steffen, K.: Relating regional and point measurements of accumulation in southwest Greenland, *The Cryosphere*, 14, 385–402, <https://doi.org/10.5194/tc-14-385-2020>, 2020.
21. Vandecrux, B., Fausto, R. S., Van As, D., Colgan, W., Langen, P. L., Haubner, K., Ingeman-Nielsen, T., Heilig, A., **Stevens, C. M.**, MacFerrin, M., Niwano, M., Steffen, K., and Box, J. E.: Firn cold content evolution at nine sites on the Greenland ice sheet between 1998 and 2017, *J. Glaciol.*, 66, 591–602, <https://doi.org/10.1017/jog.2020.30>, 2020.
22. MacFerrin, M., Machguth, H., As, D. V., Charalampidis, C., **Stevens, C. M.**, Heilig, A., Vandecrux, B., Langen, P. L., Mottram, R., Fettweis, X., Broeke, M. R. V. D., Pfeffer, W. T., Moussavi, M. S., and Abdalati, W.: Rapid expansion of Greenland's low-permeability ice slabs, *Nature*, 573, 403–407, <https://doi.org/10.1038/s41586-019-1550-3>, 2019.

23. Verjans, V., Leeson, A. A., **Stevens, C. M.**, MacFerrin, M., Noël, B., and van den Broeke, M. R.: Development of physically based liquid water schemes for Greenland firn-densification models, *The Cryosphere*, 13, 1819–1842, <https://doi.org/10.5194/tc-13-1819-2019>, 2019.
24. Vandecrux, B., MacFerrin, M., Machguth, H., Colgan, W. T., Van As, D., Heilig, A., **Stevens, C. M.**, Charalampidis, C., Fausto, R. S., Morris, E. M., Mosley-Thompson, E., Koenig, L., Montgomery, L. N., Miège, C., Simonsen, S. B., Ingeman-Nielsen, T., and Box, J. E.: Firn data compilation reveals widespread decrease of firn air content in western Greenland, *The Cryosphere*, 13, 845–859, <https://doi.org/10.5194/tc-13-845-2019>, 2019.
25. Lilien, D. A., Fudge, T. J., Koutnik, M. R., Conway, H., Osterberg, E. C., Ferris, D. G., Waddington, E. D., and **Stevens, C. M.**: Holocene Ice-Flow Speedup in the Vicinity of the South Pole, *Geophysical Research Letters*, 45, 6557–6565, <https://doi.org/10.1029/2018GL078253>, 2018.
26. Shean, D. E., Christianson, K., Larson, K. M., Ligtenberg, S. R. M., Joughin, I. R., Smith, B. E., **Stevens, C. M.**, Bushuk, M., and Holland, D. M.: GPS-derived estimates of surface mass balance and ocean-induced basal melt for Pine Island Glacier ice shelf, Antarctica, *The Cryosphere*, 11, 2655–2674, <https://doi.org/10.5194/tc-11-2655-2017>, 2017.
27. Sommers, A. N., Rajaram, H., Weber, E. P., MacFerrin, M. J., Colgan, W. T., and **Stevens, C. M.**: Inferring Firn Permeability from Pneumatic Testing: A Case Study on the Greenland Ice Sheet, *Front. Earth Sci.*, 5, <https://doi.org/10.3389/feart.2017.00020>, 2017.
28. Lundin J, **Stevens C.M.**, Arthern R, Buizert C, Orsi A, Ligtenberg S, Simonsen S, Cummings E, Essery R, Leahy W, Harris P, Helsen M, Waddington E. Firn Model Intercomparison Experiment (FirnMICE). *Journal of Glaciology*. 2017 February 07; 63(239):401-422.

(iv) Selected Oral Presentations

1. *Constraining glacier mass balance uncertainty using firn cores from Wolverine Glacier, Alaska*. Stevens, C.M., Sass, L., Florentine, C., Baker, E., McNeil, C. Bollen, K. American Geophysical Union Annual Meeting, Washington D.C., December 12, 2024. (invited)
2. *Observations of Firn Compaction near South Pole Compared with Model Predictions*, Stevens, C.M., Lilien D.A., Conway, H., Waddington, E.D., Fudge, T.J., Koutnik, M.R., Medley B.. American Geophysical Union Fall Meeting, New Orleans, LA, December 16, 2021
3. *Firn effects on ice core climate records*, Stevens, C.M., IARPC Glaciers and Sea Level Collaboration Team Meeting, Online, February 22, 2021 (invited)
4. *Firn strain-rate observations compared with firn model predictions in Greenland*, Stevens, C.M., MacFerrin M., Waddington, E.D., Abdalati, W., EGU General Assembly, Vienna, April 12, 2019
5. *Challenges in modeling firn evolution in the percolation zone*, Stevens, C.M., MacFerrin, M. Waddington, E.D., Abdalati, W., IARPC Glaciers and Sea Level Collaboration Team Meeting, Online, October 27, 2017
6. *Modeling Nisqually Glacier surface-elevation and length changes using a mass-balance record derived from reanalysis and weather-station data*, Stevens, C.M., Conway, H., Koutnik, M., Rasmussen, A., Greenberg, H., Kennard P., GSA Annual Meeting, Seattle, WA, October 22, 2017
7. *Comparison of Greenland firn compaction-rate and stratigraphy data to model predictions from the Community Firn Model*, Stevens, C.M., MacFerrin, M., Waddington, E., Abdalati, W., Vandecrux, B., Heilig, A., Retain workshop on Modeling Meltwater in Snow and Firn: Processes, Validation, Intercomparison and Model uses of Optical Remotely Sensed Data, Copenhagen, Denmark, September 20, 2017

(iv) Other Products

The Community Firn Model (Lead Developer). An open-source, modular firn model framework, doi:10.5281/zenodo.3585885.

(v) Synergistic Activities

- Member of the International Firm Symposium organizing team (2022-2023).
- Mentor for the NASA summer internship program (2022).
- Physics and math teach for High School High Scholar Program, a STEM-based summer education program for first-generation and/or low-income students of color (2010, 2013), Carbondale, CO.
- Volunteer at the Pacific Science Center, Seattle, WA (2010-2019, 2024).
- Teaching fellow, Colorado Rocky Mountain School (2009-2010)