Joel A. Wilner

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Curriculum Vitae

Education

2021 – present **Dartmouth College**
Ph.D. in Earth Sciences (expected 2026)
Advisors: Dr. Mathieu Morlighem, Dr. Meredith A. Kelly

2018 – 2021 **Brown University**
M.Sc. in Earth, Environmental and Planetary Sciences
Advisors: Dr. Alexander J. Evans, Dr. Christian Huber

2014 – 2018 **Middlebury College**
B.A. in Geology, *magna cum laude*
Minors: Mathematics, African Studies
Cumulative GPA: 3.75/4.00; Geology GPA: 3.87/4.00
Thesis: *Low-Temperature Thermochronology of the Moodus Deep Core, Connecticut: Spatio-Temporal Mechanisms of Passive Margin Rejuvenation*
Advisor: Dr. William H. Amidon

2017 **University Centre in Svalbard**, *semester abroad*
Course: Arctic Geophysics

Research Publications

Journal Articles

1. **J. A. Wilner**, A. M. Doughty, M. A. Kelly, and M. Morlighem, "Disentangling topographic and climatic controls on glacier length: A case study in tropical alpine Colombia," *Earth and Planetary Science Letters*, In review.
2. **J. A. Wilner**, B. J. Nordin, A. Getraer, R. M. Gregoire, M. Krishna, J. Li, D. J. Pickell, E. R. Rogers, K. T. McDannell, M. C. Palucis, and C. B. Keller, "Limits to timescale dependence in erosion rates: Quantifying glacial and fluvial erosion across timescales," *Science Advances*, vol. 10, no. 51, eadr2009, 2024.
3. **J. A. Wilner**, M. Morlighem, and G. Cheng, "Evaluation of four calving laws for Antarctic ice shelves," *The Cryosphere*, vol. 17, no. 11, pp. 4889–4901, 2023.
4. A. M. Palumbo, A. N. Deutsch, M. S. Bramble, J. D. Tarnas, B. D. Boatwright, L. H. Lark, E. M. Nathan, **J. A. Wilner**, Y. Chen, B. A. Anzures, C. A. Denton, L. Tokle, G. Casey, A. G. Pimentel, J. W. Head, K. R. Ramsley, U. Shah, A. Kothandhapani, H. P. Gokul, J. Mehta, and V. Vatsal, "Scientific exploration of Mare Imbrium with OrbitBeyond, Inc.: Characterizing the regional volcanic history of the Moon," *New Space*, vol. 7, no. 3, pp. 137–150, 2019.
5. S. W. Campbell, Z. R. Courville, S. N. Sinclair, and **J. A. Wilner**, "Brine, englacial structure and basal properties near the terminus of McMurdo Ice Shelf, Antarctica," *Annals of Glaciology*, vol. 58, no. 74, pp. 1–11, 2017.

Technical Reports

1. S. W. Campbell, Z. R. Courville, S. N. Sinclair, and **J. A. Wilner**, "Geophysical survey of McMurdo Ice Shelf to determine infrastructure stability and for future planning," Engineer Research and Development Center, Hanover, NH, United States, Tech. Rep., 2017.

First-Author Conference Proceedings

1. **J. A. Wilner**, "Linking glacier velocity and erosion: Insights from ITS_LIVE and suspended sediment," Northeast Glaciology Meeting, Ithaca, NY, 2025.
2. **J. A. Wilner**, B. J. Nordin, A. Getraer, R. M. Gregoire, M. Krishna, J. Li, D. J. Pickell, E. R. Rogers, K. T. McDannell, M. C. Palucis, and C. B. Keller, "Global quantification of glacial versus fluvial erosion rates: Limits to timescale dependence," European Geosciences Union General Assembly, Vienna, Austria, 2025.
3. **J. A. Wilner**, B. J. Nordin, A. Getraer, R. M. Gregoire, M. Krishna, J. Li, D. J. Pickell, E. R. Rogers, K. T. McDannell, M. C. Palucis, and C. B. Keller, "Global quantification of glacial versus fluvial erosion rates: Limits to timescale dependence," Landscapes Live, 2025, ***INVITED**.
4. **J. A. Wilner**, M. A. Kelly, A. A. Doughty, M. Morlighem, S. Restrepo-Moreno, Noriega-Londoño, P. B. Galloway, and G. Bromley, "Last Glacial Maximum climate reconstructions from glacier evolution modeling in the Colombian Andes," poster presentation, American Geophysical Union Annual Meeting, Washington, DC, 2024.
5. **J. A. Wilner**, M. A. Kelly, A. M. Doughty, and M. Morlighem, "Disentangling topographic and climatic controls on tropical moraine distribution," oral presentation, Northeast Glaciology Meeting, Cambridge, MA, 2024.
6. **J. A. Wilner**, B. J. Nordin, A. Getraer, R. M. Gregoire, M. Krishna, J. Li, D. J. Pickell, E. R. Rogers, K. T. McDannell, M. C. Palucis, and C. B. Keller, "Quantifying the global importance of glacial versus fluvial erosion rates over different timescales," oral presentation, American Geophysical Union Annual Meeting, Washington, DC, 2024.
7. **J. A. Wilner**, M. A. Kelly, A. M. Doughty, and M. Morlighem, "Topographic controls on tropical moraine distribution: A synthetic glacier modeling approach," eLightning presentation, American Geophysical Union Annual Meeting, San Francisco, CA, 2023.
8. **J. A. Wilner**, M. Morlighem, and G. Cheng, "Evaluating and comparing calving laws in Antarctica," oral presentation, Northeast Glaciology Meeting, Orono, ME, 2023, ***OSPA AWARD**.
9. **J. A. Wilner** and M. Morlighem, "Understanding calving dynamics through explainable machine learning," poster presentation, Northeast Glaciology Meeting, Hanover, NH, 2022.
10. **J. A. Wilner**, M. Morlighem, and G. Cheng, "Evaluating and comparing calving laws in Antarctica," oral presentation, American Geophysical Union Fall Meeting, Chicago, IL, 2022.
11. **J. A. Wilner**, A. J. Evans, R. E. Milliken, and M. M. Sori, "Spectroscopy of domes on Ceres and implications for emplacement," scheduled oral presentation (conference cancelled due to COVID-19 pandemic), Lunar and Planetary Science Conference, The Woodlands, TX, 2020.
12. **J. A. Wilner** and W. H. Amidon, "Low-temperature thermochronology of the Moodus Deep Core, Connecticut: Understanding spatio-temporal patterns of passive margin rejuvenation in New England," poster presentation, American Geophysical Union Fall Meeting, Washington, DC, 2018.
13. **J. A. Wilner** and W. H. Amidon, "Preliminary results: Deep drill core thermochronology, southeastern Connecticut," oral presentation, Geological Society of America Northeastern Section Meeting, Burlington, VT, 2018.
14. **J. A. Wilner**, W. H. Amidon, and S. N. Thomson, "Timing and rate of exhumation in the northeastern U.S. determined from drill core thermochronology," oral presentation, North Atlantic Margins Workshop, Dublin, Ireland, 2018.
15. **J. A. Wilner**, A. E. Hofmann, K. P. Hand, and 2016 Polarstern (PS101) Science Team, "Sea ice as a sink for CO_2 and biogeochemical material: A novel sampling method and astrobiological applications," poster presentation, American Geophysical Union Fall Meeting, New Orleans, LA, 2017.

16 **J. A. Wilner**, K. J. Tinto, R. E. Bell, and C. S. Siddoway, "Distribution of sediments beneath the Ross Ice Shelf, Antarctica, from airborne magnetic data," poster presentation, American Geophysical Union Fall Meeting, San Francisco, CA, 2016.

17 **J. A. Wilner**, B. Smith, T. Moore, S. W. Campbell, B. V. Slavin, J. Hollander, and J. Wolf, "Estimating temporal redistribution of surface melt water into upper stratigraphy of the Juneau Icefield, Alaska," poster presentation, American Geophysical Union Fall Meeting, San Francisco, CA, 2015.

Awards, Fellowships, and Academic Travel Funding

2023 — **Irving Institute Student Grant**, Dartmouth College

— **Conference Travel Award**, Guarini School of Graduate and Advanced Studies, Dartmouth College

2021 – 2023 — **NSF Joint Science Education Project (JSEP) Graduate Fellowship**

2022 — **Outstanding Student Presentation Award (OSPA)**, American Geophysical Union Fall Meeting 2022

2018 — **Conference Travel Award**, Brown University Graduate School

2014 – 2018 — **College Scholar** (*highest semester academic honor; all semesters*), Middlebury College

2017 — **Senior Research Project Supplement Award**, Middlebury College Undergraduate Research Office

— **Highpointers Club Scholarship**, Highpointers Club

2015 – 2017 — **Academic Conference Travel Fund Award (x3)**, Middlebury College Undergraduate Research Office

2015 — **First-Year Explore Grant**, Middlebury College Center for Careers and Internships

Research Experiences

Research Projects

2021 – present — **Dartmouth College**, *Graduate Research Assistant*

• Evaluating and comparing calving laws in Antarctica *(PI: Dr. Mathieu Morlighem)*
• Summit Land-Ice Validation of Elevation Retrievals in Greenland (SLIVER) *(PI: Dr. Robert Hawley)*
• Topographic controls on tropical glacier extent and moraine distribution *(PI: Dr. Meredith Kelly)*
• Limits to timescale-dependence in glacial and nonglacial erosion rates *(PI: Dr. C. Brenhin Keller, Dr. Marisa Palucis)*
• Last Glacial Maximum paleo-glacier modeling, Páramo de Frontino, Colombia *(PI: Dr. Meredith Kelly)*
• Global correlation between glacier velocities and proglacial suspended sediment concentration

2022 — **McCarthy International Summer School in Glaciology**, *Selected Participant*

• Modeling feedbacks between orographic precipitation, subglacial erosion, and glacier flow *(PI: Dr. Andy Aschwanden)*

2018 – 2020 — **Brown University**, *Graduate Research Assistant*

• Spectroscopy of putative cryovolcanic domes on Ceres *(PI: Dr. Alexander Evans, Dr. Ralph Milliken)*

2017 – 2018 — **Middlebury College**, *Undergraduate Researcher*

• Apatite fission track and (U-Th)/He borehole thermochronology *(PI: Dr. William Amidon)*

Research Experiences (continued)

2017 **NASA Jet Propulsion Laboratory**, *Summer Intern*
• Geochemical analyses of Arctic sea ice cores with a novel sampling technique *(PI: Dr. Amy Hofmann, Dr. Kevin Hand)*

2016 **Lamont-Doherty Earth Observatory, Columbia University**, *NSF Research Experience for Undergraduates: Summer Intern*
• Mapping crustal topography beneath the Ross Ice Shelf from airborne magnetics
• Mapping englacial structure and thickness of the Ross Ice Shelf from airborne radar

2015 **Juneau Icefield Research Program**, *Selected Participant*
• Quantifying englacial refreeze of surface melt with ice-penetrating radar *(PI: Dr. Seth Campbell)*

Field Experience

2023 **Páramo de Frontino, Colombia**. Moraine sampling for cosmogenic nuclides and paleoglacier reconstruction *(PI: Dr. Meredith Kelly)*

2022 **Summit Station, Greenland**. ApRES radar deployment for firn densification and dynamic strain components of surface elevation change and ice anisotropy *(PI: Dr. Robert Hawley)*

Kennicott Glacier, AK. Ice cliff dynamics and mass balance of a debris-covered Alaskan glacier *(PI: Dr. Eric Petersen)*

2019 **Nisyros, Greece**. Field course: geologic mapping of volcanic deposits *(PI: Dr. Christian Huber)*

2018 **Guanacaste Province, Costa Rica**. Field course: arsenic geochemistry and geologic mapping *(PI: Dr. Peter Ryan)*

2017 **Fram Strait, Svalbard, Norway**. Oceanographic research cruise on M/S *Polarsyssel* with *in situ* sea ice permeability experiments

Tellbreen and Blekumbreen glaciers, Svalbard, Norway. Structure-from-motion photogrammetry for glacier clast provenance and DEM development

2016 **Jarvis Glacier, AK**. Ice-penetrating radar for glacier shear rheology *(PI: Dr. Seth Campbell)*

2015 **Juneau Icefield, AK**. 2-month research ski traverse with ice-penetrating radar and GPS for englacial hydrology and mass balance (Juneau Icefield Research Program) *(PI: Dr. Seth Campbell)*

2014 **Lake Champlain, VT/NY**. Bathymetric and sub-bottom geologic survey of southern Lake Champlain on R/V *David Folger (PI: Dr. Thomas Manley)*

Teaching Experience

2025 **Teaching Assistant and Grader, Dartmouth College**. EARS 013: "Introduction to Computational Methods in Earth Science," Prof. C. Brenhin Keller

2021 – 2023 **NSF Joint Science Education Project (JSEP) Fellow, Dartmouth College**. Developed and led interactive remote and field modules on iceberg calving and photogrammetry for high school students in Greenland

2021 **Teaching Assistant and Grader, Dartmouth College**. EARS 014: "Meteorology," Prof. Erich Osterberg

2020 **Teaching Assistant, Grader, and Invited Lecturer, Brown University**. EEPS 0050: "Mars, Moon, and the Earth," Prof. John Mustard

Teaching Experience (continued)

2018 — **Teaching Assistant and Grader, Middlebury College**. MATH 0116: "Introduction to Statistical Science," Prof. Alexander Lyford

— **Invited Lecturer in Thermochronology, Middlebury College**. GEOL 0301: "Plate Tectonics and World Geology," Prof. William Amidon

2017 – 2018 — **Peer Writing Tutor, Middlebury College**. RELI 0233: "Christianity in Africa," Prof. Ellie Gebarowski-Shafer; peer writing tutor for students in various other science and humanities courses

2016 — **Teaching Assistant and Film Production Tutor, Middlebury College**. CRWR 1005: "Adventure Writing and Digital Storytelling," Prof. Peter Lourie

Professional Workshops Attended

2024 — **Informal Cosmogenic-nuclide Exposure-age Database (ICE-D) workshop**, University of Massachusetts Amherst, Amherst, MA

2023 — **7th Open Global Glacier Model (OGGM) workshop**, University of Edinburgh, Edinburgh, Scotland, UK

2022 — **Autonomous Phase-Sensitive Radio Echo-Sounder (ApRES) workshop**, Lamont-Doherty Earth Observatory, Columbia University, Palisades, NY

Relevant Coursework

Undergraduate Coursework

Geosciences — Snow/Ice Physics • Sea/Air/Ice Interactions • Geomorphology • Structural Geology • Environmental Geochemistry • Mineralogy • Climate Dynamics • Climate Dynamics • Plate Tectonics • Applied Geophysics • Remote Sensing in Geoscience • Physical Oceanography • Bedrock Geology of Vermont • Geology of Mars

Physics — Classical Mechanics • Electricity and Magnetism • Thermodynamics/Fluids/Waves/Optics

Mathematics — Multivariable Calculus • Linear Algebra • Differential Equations • Statistical Science • Data Science

Graduate Coursework

Geosciences — Continuum Physics of the Solid Earth • Advanced Methods for Environmental Data Analysis • Mathematical Modeling of Earth Processes • Isotope Geochemistry • Climate Dynamics • Glaciology • Glacial Erosion • Planetary Surface Processes • Planetary Remote Sensing • Geophysics of the Inner Solar System • Physics of Planetary Evolution • Gravitational Analyses • Physical Volcanology

Other — Computational Approaches to Modeling and Quantitative Analysis in Natural Sciences • Applied Machine Learning • Astrobiology • Exoplanets • Scientific Writing

University Activities

2024 — **Graduate Student Faculty Search Committee**, Department of Earth Sciences, Dartmouth College

2022 – 2023 — **Visiting Speaker Coordinator Committee**, Department of Earth Sciences, Dartmouth College

2019 – 2020 — **Treasurer**, Geology Club, Department of Earth, Environmental and Planetary Sciences, Brown University

University Activities (continued)

2017 — **Arctic Geophysics Department Representative**, Student Council, University Centre in Svalbard

2016 – 2017 — **President**, Midd Acro gymnastics club, Middlebury College

Mission Involvement

2018 – 2019 — **OrbitBeyond-TeamIndus Z-01 lunar lander**: Brown University Design Reference Mission (DRM) team member, participant in science team meetings

2016 — **Ross Ocean and Ice Shelf Environment and Tectonic Setting Through Aerogeophysical Surveys (ROSETTA-Ice)**: Mission participant as intern at Lamont-Doherty Earth Observatory

Skills

Coding	MATLAB, Python, R, Julia, LaTeX
Software Packages	Ice-sheet and Sea-level System Model (ISSM), COMSOL Multiphysics, ArcGIS, QTQt, Agisoft Metashape, Microsoft Office
Field skills	Ice-penetrating radar deployment (conventional and ApRES), glaciology techniques (mass balance ablation staking, mass balance snow pits), geologic mapping
Laboratory skills	Laser ablation inductively coupled mass spectrometry (LA-ICP-MS), Picarro methane analysis

Miscellaneous

Professional Affiliations

2025 – present — **European Geosciences Union (EGU)**, member

2022 – present — **American Geophysical Union (AGU)**, member

International Association of Cryospheric Sciences (IACS), member

International Glaciological Society (IGS), member

Certifications

2018 — **COMSOL Multiphysics Intensive Training**

COMSOL Multiphysics Advanced Structural Mechanics Training

Outdoor Experience

- Mountaineering, glacier travel, and all-season backpacking experience
- Crevasse and avalanche rescue training
- Attempting to climb the tallest mountain of each U.S. state (49 of 50 complete)
- Attempting to climb the tallest mountain of 100 countries (39 complete)
- Notable mountain ascents include Kilimanjaro (Tanzania), Pico de Orizaba (Mexico), Doyle's Delight (Belize), Mount Rainier (WA), Mount Baker (WA), Granite Peak (MT), and Gannett Peak (WY)