Ryan M. Strickland

School of Geography and Sustainable Development
University of St Andrews, Scotland
Email: rs354@st-andrews.ac.uk

—Education—

PhD Geoscience (2024), University of Arkansas, Fayetteville
Thesis: *Controls on the development of hummocky topography on debris-covered glaciers*
Advisor: Matthew D. Covington, Associate Professor of Geoscience
B.A. Physics (2009), Hendrix College
Dissertation: *Calibration and testing of a six degree-of-freedom hybrid rocket test stand*

—Appointments—

Research Fellow (Sep. 2024-Present). SGSD, University of St Andrews, Scotland
Visiting Scholar (Feb.-May 2023), School of Science, Kathmandu University, Nepal
Visiting Scholar (Sep.-Dec. 2022), SGSD, University of St Andrews, Scotland
Graduate Teaching Assistant (2019-2024), Dept. of Geosciences, University of Arkansas, USA
Science and Math Instructor (2013-2018), Idyllwild Arts Academy, Idyllwild, CA, USA

—Fellowships and Grants—

Arctic Travel and Partnerships Fund (2026). £492; to support model development collaboration with Dr. T. Zwinger at CSC-IT Center for Science, Finland. Scottish Arctic Network.
SAGES Small Grant (2025). £400; to support production of *CryoCast: Glacial Thinking in a Warming World* podcast. Scottish Alliance for Geoscience, Environment and Society.
ITGC Early Career Research Grant (2025). £4,500; International Thwaites Glacier Collaboration.
Sturgis International Fellow (2022-23). $15,500; Fulbright College, University of Arkansas.
Graduate Student Research Grant (2020). $1,245; Geological Society of America.
Distinguished Doctoral Fellow (2019-24). $88,000; Fulbright College, University of Arkansas.

—Peer-Reviewed Publications—

Summary: 5 first-author papers since 2023 (2 published, 3 in review)

Strickland, R. M., Law, R., Christoffersen, P., and Young, T. J. (in review). Complex flow over topographic highs beneath Thwaites Glacier, Antarctica. *JGR: Earth Surface*

Strickland, R. M., Wheel, I. and Young, T. J. (in review). Dynamic control of ice stream bifurcations revealed by energy minimization. *AGU Advances*

Strickland, R. M., Covington, M. D., Gulley, J. D. (in review). Controls on the growth of topographic depressions on debris-covered glaciers. *JGR: Earth Surface*

Strickland, R. M. & Covington, M. D. (2024). The formation of glacier dirt cones. *Journal of Glaciology*, 71, e38. `https://doi.org/10.1017/jog.2025.32`

Strickland, R. M., Covington, M. D., Gulley, J. D., Kayastha, R. B., Blackstock, J. M. (2023). Englacial drainage drives positive feedback depression growth on the Ngozumpa Glacier, Nepal. *Geophysical Research Letters*, 50, e2023GL104389. `https://doi.org/10.1029/2023GL104389`

—Conference Presentations—

Strickland, R. M., Wheel, I., and Young, T. J. (2025, Sep.) Ice stream bifurcations: A simple framework for predicting flow redistribution. Oral presentation in IGS British Branch Meeting, Oxford, England.

Strickland, R. M., Law, R., Christoffersen, P., and Young, T. J. (2025, Jun.) Complex flow over topographic highs beneath Thwaites Glacier, Antarctica. Oral presentation in International Thwaites Glacier Collaboration Annual Meeting 2025, online.

Strickland, R. M., Law, R., Holschuh, N., Joughin, I., Christoffersen, P., and Young, T. J. (2025, Apr.) Temperate ice develops at topographic highs beneath Thwaites Glacier. Oral presentation in EGU General Assembly 2025, Vienna, Austria.

Strickland, R. M., Covington, M. D., Gulley, J. D. (2024, Sep.) A topographic evolution model for debris-covered glaciers. Oral presentation in IGS British Branch Meeting, Liverpool, England.

Strickland, R. M., Covington, M. D., Gulley, J. D. (2024, Apr.) Modeling the development of topographic depressions on debris-covered glaciers. Oral presentation in EGU General Assembly 2024, Vienna, Austria.

Strickland, R. M., Covington, M. D., Gulley, J. D., Blackstock, J. M., Kayastha, R. B., Sherpa, D. T. (2021, Oct.). Scale invariance of topographic depressions on Himalayan debris-covered glaciers. Oral presentation in GSA Connects 2021. Geological Society of America.

Strickland, R. M., Covington, M. D., Gulley, J. D., Kayastha, R. B., Sherpa, D. T. (2020, Dec.). Fractal perimeter dimensions of topographic sinks may reveal clues to dominant melt processes on Himalayan debris covered glaciers. Oral presentation in AGU Fall Meeting 2020. American Geophyiscal Union.

—Research Methodology, Teaching, and Public Outreach—

Methods

- Analytical and numerical model development for glaciers and landscape evolution
- Use of high-performance computing (HPC) resources
- Geologic and geospatial data analysis

Programming and Software

Languages: Python, C, Fortran, MATLAB
Software: Elmer/Ice, Landlab, WhiteboxTools, MODFLOW, QGIS, Agisoft Metashape, HyRiver/Py3dep

Teaching

- Geologic Data Analysis (Spr. 2021, 2022; Fall 2023), Hydrogeology (Spr. 2022), Honors Physical Geology Lab (Fall 2021), Physical Geology Lab (Spr. 2024)
- Data Analysis and Modeling with Python (Spr. 2023)- Kathmandu University, Nepal
- 5 years experience teaching high school physics, calculus, and astronomy

Public Outreach

- Creator and writer of *CryoCast: Glacial Thinking in a Warming World*, a glaciology podcast targeted for general audiences and students (expected release April 2026)
- Volunteer instructor for *Polar Outreach, Learning, and Research in SAGES (POLARIS)* program, in collaboration with The Polar Academy (2024-present).

—Invited Lectures—

Strickland, R. M. (2025). Forks in Flow: Energy minimization governs the geometry of ice stream bifurcations, *Institute for Marine and Antarctic Sciences, University of Tasmania*. 9 Oct 2025.

Strickland, R. M. (2025). Controls on the development of hummocky topography on debris-covered glaciers, *NASA GISS Sea Level Rise Seminar*. 11 Mar 2025.

Strickland, R. M. (2024). Controls on the development of hummocky topography on debris-covered glaciers, *Center for Hydrogeology, University of Neuchâtel*. 18 Oct 2024.

Strickland, R. M. (2024). Controls on the development of hummocky topography on debris-covered glaciers, *Dept. of Geosciences, University of Arkansas*. 1 Mar 2024. `https://geosciences.uark.edu/events-and-colloquium-calendar/index.php`

Strickland, R. M. (2023). Modelling the evolution of hummocky topography on debris-covered glaciers, *College of Science, Tibet University, Lhasa, TAR, PRC*. 23 Sep 2023.

Strickland, R. M. (2023). Insights into the development of hummocky topography on Himalayan debris-covered glaciers, *Himalayan Cryosphere, Climate, and Disaster Research Center, School of Environmental Science, Kathmandu University, Nepal*. 8 Feb 2023.

Strickland, R. M. (2022). Does englacial drainage drive the development of hummock topography on debris-covered glaciers?, *Dept. of Geography and Sustainable Development, University of St Andrews, Scotland, UK*. 2 Nov 2022.

Strickland, R. M. (2022). The shape of melt: Investigating feedback between glacier melt and topography on the Kuskulana Glacier, *Wrangell Institute for Science and Environment Lecture Series*. 18 Mar 2022. `http://www.wise-edu.org/science-lecture-series.html`

—In the Media—

Strickland, R. M. (Spring 2026). Modelling Ice: How glaciers shape our past and forecast our future. *The Geographer: Magazine of the Royal Scottish Geographic Society*.

Fox, Douglas (10 Jan 2024). These caves mean death for Himalayan Glaciers. *National Geographic Newsletter*. `https://www.nationalgeographic.com/environment/article/everest-melting-caves-himalayan-glaciers-climate-change`

Strickland, R. M. (6 Sep 2023). Unraveling a paradox of Himalayan glacier melt. *PHYS.org*. `https://phys.org/news/2023-09-unraveling-paradox-himalayan-glacier.html`

Sayer, Allison (28 Apr 2023). Consider the anthill. *Copper River Record*. `https://www.copperriverrecord.net/tributaries/consider-the-anthill`

Sayer, Allison (14 Oct 2022). Modeling drainage on the Kuskulana Glacier. *Copper River Record*. `https://www.copperriverrecord.net/tributaries/modeling-drainage-on-the-kuskulana-glacier`

Gulley, Jason (13 Sep 2021). A stunning look at the hidden mysteries of glacier caves. *The New York Times*. `https://www.nytimes.com/2021/09/13/travel/glacier-caves.html`