MOLLY K. STROUD

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EDUCATION

Virginia Tech   *2025*
PhD in Geosciences

Dartmouth College   *2021*
Bachelor of Arts in Earth Sciences with English minor

WORK AND RESEARCH EXPERIENCE

Postdoctoral Associate, Virginia Tech   Sept. 2025 - Present
Center for Ecosystem Forecasting, Biological Sciences
- Full-time postdoc
- Incorporating satellite remote sensing data into forecasting models to improve predictions of water quality in local drinking water reservoirs

Research Assistant, Virginia Tech   Sept. 2021 – Aug. 2025
Global Rivers Group, PI: Dr. George Allen
- Full-time research assistant
- Employing a variety of computational and GIS methods to observe and understand inland water quality using innovative remote sensing techniques

Summer Intern, NASA Jet Propulsion Laboratory   Jun. 2022 - Aug. 2022
PI: Dr. Marc Simard
- Full-time JPL summer intern studying temporal requirements for a water quality-focused optical remote sensor

Undergraduate Research Assistant, Dartmouth College   Sept. 2018 - May 2021
Palucis Lab, PI: Dr. Marisa Palucis
- Part-time research assistant
- Aimed to understand the processes that shape planets using remote sensing to study the Martian surface, focusing on alluvial fans in craters; work culminated in an honors thesis that received highest honors

PUBLICATIONS

Stroud M., Allen G.H., Simard M., Jensen D.J., Gorr B., and Selva D. "Optimizing satellite mission requirements to measure total suspended solids in rivers." *IEEE Transactions on Geoscience and Remote Sensing.* 2024. [10.1109/TGRS.2023.3337641](#).

Stroud M., Allen G.H., Minear J.T., Cisneros J., and Smith L.C. "SWOT Satellite: A new tool for fluvial geomorphology". *GSA Today,* v. 35, p. 4–9. 2025. https://doi.org/10.1130/GSATG630A.1.

Stroud M., Allen G.H., Eidam E., and Wang C. "Can ICESat-2 estimate turbidity in rivers and lakes?". *AGU Earth and Space Science.* 2025. In review.

Saemian P., Elmi O., **Stroud M.**, Riggs R., Kitambo B.M., Papa F., Allen G.H., and Tourian M.J. "Satellite Altimetry-based Extension of global-scale in situ river discharge Measurements." *Earth System Science Data*. 2025. https://doi.org/10.5194/essd-2024-406.

Ravindra V., **Stroud M.**, Allen G.H., Selva D., Godsey S., Fritz K., Honsen J., Busch M., and Gao S. "Optimizing Monitoring Routes for Electric Vehicles with Access to Multiple Charging Stations Using Mixed Integer Programming: Case Study with Non-Perennial Rivers." *AIAA SciTech*. 2024.

Gorr, B., Selva D., Morgan J., Li Y., Gao H., **Stroud M.**, Ellis E., and Allen G. H. "Design of a Satellite Constellation for Monitoring Inland Water Quality." *Acta Astronautica.* 2024. https://doi.org/10.1016/j.actaastro.2024.03.062.

CONFERENCE PRESENTATIONS

Stroud, M., Allen G.H., Minear, J.T., and Cisneros, J. "Exploring fluvial geomorphology applications of SWOT." AGU 2024 Fall Meeting. Oral presentation.

Stroud, M., Allen G.H., and Minear, J.T. "Exploring fluvial geomorphology applications of SWOT." SWOT Science Team Meeting 2024. Poster presentation.

Stroud, M., Allen G.H., and Fayne J. "Developing Innovative Methods to Estimate Turbidity in Inland Waters: A Lidar-Based Approach." AGU 2023 Fall Meeting. Poster presentation.

Stroud, M., Allen G.H., Simard M., Jensen D.J., Selva D., & Gao H. "Assessing Altimetry and Optical Remote Sensing Products to Study Global Sediment Transport Dynamics in Earth's Inland Water Bodies." AGU 2022 Fall Meeting. Poster presentation.

Allen, George H., Daniel Selva, Benjamin Jared Gorr, Huilin Gao, Emily A. Ellis, **Molly Stroud**, Yao Li, John Cole Morgan, Ryan Riggs, and Helen Reed. "Developing a SmallSat Mission Concept to Monitor Inland Water Quality." AGU 2022 Fall Meeting. Poster presentation.

Palucis, Marisa C., **Molly Stroud**, & Alexander A. Morgan. "Crater rim geometry controls on alluvial fan formation on Mars: Implications for constraining global climate in the late-Hesperian to early Amazonian." GSA Fall Meeting Online. Oral presentation, presenting author.

Palucis, Marisa C., **Molly Stroud**, & Alexander A. Morgan. "Topographic constraints on alluvial fan formation on Mars." AGU 2019 Fall Meeting. Poster presentation.

SCHOLARSHIPS AND AWARDS

UpGoer5 Presentation Winner   Spring 2025
Won a department-wide presentation competition, with the guidelines of presenting research using only the 1000 most commonly used words in 5 minutes

Virginia Tech Graduate Student Doctoral Assistantship (2x)   Fall 2023-Spring 2024, Spring 2025
Award for excellence in research and coursework ($11K)

Virginia Tech Graduate Student Affairs Committee Research Award (2x)   Spring 2023, Spring 2024
Award for research-related expenses based on a project proposal, funded by the Cooper Memorial Geology Fund ($1K)

Lechner Graduate Scholarship Fall 2021/Spring 2022
Award for academic excellence in the geosciences ($2k)

Paul K. Richter and Evalyn E. Cook Richter Memorial Fund Summer 2020
Summer research grant, focused on understanding the spatial distribution of alluvial fans in Martian craters ($4k)

TEACHING EXPERIENCE

"Remote Sensing of Hydrology", Virginia Tech *Fall 2025*
Guest lecturer
- Presented hyperspectral remote sensing (imaging spectroscopy) and its hydrologic applications

"Geomorphology", Virginia Tech *Spring 2025*
Guest lecturer
- Presented on using the new SWOT satellite to study fluvial geomorphology

"Elements of Geology", Virginia Tech *Fall 2024*
Laboratory Teaching Assistant
- Taught an introductory Geosciences lab designed for engineering majors, to improve their understanding of basic geology and hazards
- Led two labs a week, graded all lab material, and held weekly office hours

"How the Earth Works", Dartmouth College *Fall 2018, Fall 2020*
Undergraduate Teaching Assistant
- Assisted an introductory Earth Sciences course and worked alongside professors and teaching team to help students actively engage with course material
- Created and tested innovative classroom techniques to improve the students' experiences in a large classroom

"Environmental Change", Dartmouth College *Spring 2021*
Learning Fellow
- Assisted an introductory Earth Sciences course and worked closely alongside professors to create a smooth transition to online learning that would allow students to continue to engage with course material
- Created interactive content for students, helped conduct weekly lab sessions, and held office hours

SERVICE AND VOLUNTEER EXPERIENCE

AGU Online Session Convener *Spring 2024*
- Convener for online poster session H06 (Flooding).

Undergraduate Research Mentor *2023-2024*
- Led a group of three undergraduate students in conducting research. Introduced students to research techniques and organized meetings and help sessions. Project involved matching gauge and altimetry measurements to ensure good discharge estimates.

Letters to a Pre-Scientist (LPS) *2023-2025*
- The LPS program encourages diversity in STEM and strives to inspire young students from low-income schools to get excited about science. As a letter-writer, I sent letters back and forth with a young middle school student, making my research accessible to a younger audience and encouraging involvement in the sciences.

Geosciences Research Symposium Communications Chair   2023-2025
- Communications chair for the graduate student-run Geosciences Student Research Symposium 2024 and 2025. Role includes handling email and social media communications and outreach.

Dartmouth College Alumni Interviewer   2022-2025
- Alumni interviewer for undergraduate admissions at Dartmouth College. I conduct evaluative and informative interviews with prospective students who have applied to the college, and also answer their questions about the school and my experiences.

Graduate Student Peer Mentor   *Virginia Tech, 2022-2023*
- Mentored a first-year graduate student in the Geosciences Department. Helped student navigate research, time management, and succeeding in grad school.

Undergraduate Mentor   *Virginia Tech, 2022-2023*
- Mentored an undergraduate student in the Geosciences Department. Helped student navigate college, think about different post-graduation opportunities, and provided general academic advice.

Co-founder and Secretary of the Dartmouth Art Club   *Dartmouth College, 2020-2021*
- Co-founded a new student organization on campus, aiming to address the gap between Studio Art students and art hobbyists. Held weekly meetings, fundraising events, and created a new community on campus.

First Year Trips Leader   *Dartmouth College, Summer 2018*
- Led a week-long outdoor intermediate hiking trip with incoming freshman. Goal was to introduce students to the college and foster a safe space to welcome them into the community. Leadership required multiple full day training sessions, including CPR/First Aid, general wilderness safety, sensitivity training, and leadership basics.

JOURNAL PEER REVIEWER
- Remote Sensing of Environment
- Water Resources Research
- PFG – Journal of Photogrammetry, Remote Sensing, and Geoinformation Science

SKILLS
- Handling, manipulation, and interpretation of GIS information (ArcGIS Pro, ArcMap, ENVI/IDL, QGIS)
- Coding (R, Python)
- Processing and analyzing hyperspectral data and large datasets
- Time series analysis (Fourier, wavelet)
- Visualization of geospatial data and figure-making (Adobe Creative Suite)