Maya Maciel-Seidman

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Education

Duke University Durham, NC
PhD in Earth and Climate Sciences August 2025 – Present
Advisor: Dr. Jonathan Ryan

Vanderbilt University Nashville, TN
Bachelor of Arts, cum laude May 2025
Major: Earth and Environmental Sciences
Minors: Data Science; Environmental and Sustainability Studies

Research Experience

Naval Research Enterprise Internship Program (NREIP) Washington, D.C.
U.S. Naval Research Laboratory Remote Sensing Division May 2024 – Present
Advisor: Dr. Trina Merrick

- Ran CNN models to delineate, categorize, and map ice wedge polygons on the Alaska North Slope.
- Conducted fieldwork in July 2025 in Utqiagvik, AK to ground truth remote sensing data.
- Built machine learning models to predict changes in active layer thickness on the Alaska North Slope.

Undergraduate Researcher Nashville, TN
Climate, Health, and Energy Equity Lab (CHEEL), Vanderbilt University January 2023 – May 2025
Advisors: Dr. Zdravka Tzankova, Dr. Carol C. Ziegler

- Developed quantitative methodology to calculate carbon offset value of energy efficient retrofits to low-income housing.

Undergraduate Research Assistant Nashville, TN
Mixed Intelligence Development for Programming Lab, Vanderbilt University January 2022 – June 2022
Advisor: Dr. Yu Huang

- Contributed to study design to determine the effect of ambient environment on programmer performance.

Research Intern Raleigh, NC
Game2Learn Lab, North Carolina State University June 2021 – August 2021
Advisor: Dr. Tiffany Barnes

- Created and tested computing-infused K-12 curriculum using UC Berkeley's Snap! language.

Teaching Experience

Grader Nashville, TN
Vanderbilt Undergraduate Data Science Fall 2022 – May 2025
DS 1000: Data Science: How Data Shape Our World

- Graded programming assignments and exams for introductory data science course.

Teaching Assistant Nashville, TN
Vanderbilt Program in Climate and Environmental Studies Fall 2023
ENVS 1101: Foundations of Climate Studies

- Assisted in administration of introductory course on challenges and solutions to the climate crisis.

Educator Garden City, NY
Long Island Children's Museum October 2018 – August 2023

- Planned and supervised STEM activities and experiments for children ages 4-12.

Fieldwork

Utqiagvik, Alaska July 2025

- Carried out flight planning and UAS safety checks to enable collection of lidar data and hyperspectral and RGB imagery of ice wedge polygons.
- Measured soil active layer thickness, logged Trimble GeoXH points, collected vegetation and soil samples, and installed an array of soil moisture sensors and an automatic weather station.
- Conducted this fieldwork for a U.S. Naval Research Laboratory project to quantify and characterize spatiotemporal changes in Arctic periglacial terrain.

Collegiate Peaks, Colorado September 2024

- Collected till samples, measured clast sizes, and calculated angle of repose to relatively date moraines from the Bull Lake and Pinedale (Pleistocene) glaciations.
- Conducted this fieldwork for Vanderbilt University course EES 4440: Glacial Geology.

Tennessee State University Agricultural Research and Education Center Fall 2023

- Augered soil samples for hydrocarbon analysis and created soil profiles.
- Collected and filtered water samples from research wells to analyze oxygen and hydrogen isotopes, dissolved inorganic carbon, and volatile organic compounds.
- Conducted this fieldwork for Vanderbilt University course EES 3280: Environmental Geochemistry.

Peer Reviewed Journal Articles

Richards, D.F., Merrick, T.L., Liang, R., Abelev, A., Vermillion, M., **Maciel-Seidman, M.L.**, Grossman, S.M. (2025) Remote Sensing-Based Framework for Detecting and Interpreting Permafrost Terrain Hydrologic Connectivity. *Remote Sensing* (under review)

Merrick, T.L., Grossman, S.M., **Maciel-Seidman, M.L.**, Richards, D.F. (2025) Remote Sensing Applications for Periglacial Terrain Characterization: A Focus on Ice Wedge Polygon Properties. *Remote Sensing* (under review)

Karas, Z; Page, D; **Maciel-Seidman, M**; Sharafi, Z; Huang, Y (2025) The Influence of Environmental Odors on Student Programmers During Code Comprehension and Code Writing. *ACM Transactions on Software Engineering and Methodology* (under review)

Maciel-Seidman M, Tzankova Z, Ziegler CC, Lele A, Lu S, Yan Y and Muchira JM (2024) Mobilizing carbon offsetting to reduce energy cost burdens: a new approach for calculating and monetizing the offset value of energy efficiency upgrades to low-income housing. *Front. Energy Res.* 12:1437560. doi: 10.3389/fenrg.2024.1437560

Maciel-Seidman, M. L., Channapatna, R., & Channapatna, S. (2020). Soil Moisture Sensing Robot: A Novel Agricultural Device. *Journal of Dawning Research*, 2, 15-33. http://dawningresearch.org/Papers/2020/JDR2020002.pdf

Conference Presentations

Maciel-Seidman, M. L., Merrick, T. L., Grossman, S. M., Richards, D. F., Abelev, A., Vermillion, M. S., Liang, R. T. (2024). Analysis of Active Layer Thickness and Climate Data at Utqiagvik, Alaska with Random Forest and Multiple Linear Regression Algorithms, Poster, *Annual Meeting of the American Geophysical Union*, Washington, D.C., Dec. 9-13, 2024.

Merrick, T. L., Richards, D. F., Grossman, S. M., **Maciel-Seidman, M. L.**, Abelev, A., Vermillion, M. S., Liang, R. T. (2024). Arctic ice wedge polygon characterization using multilevel remote sensing. Invited Presentation, *Annual Meeting of the American Geophysical Union*, Washington, D.C., Dec. 9-13, 2024.

Richards, D.F., Merrick, T. L., Grossman, S. M., **Maciel-Seidman, M. L.**, Abelev, A., Vermillion, M. S., Liang, R. T. (2024). Remote Sensing of Periglacial Trough Structure Variability and Connections to Ice-Wedge Degradation, Poster, *Annual Meeting of the American Geophysical Union*, Washington, D.C., Dec. 9-13, 2024.

Grossman, S. M., Merrick, T. L., Richards, D. F., **Maciel-Seidman, M. L.**, Abelev, A., Vermillion, M. S., Liang, R. T. (2024). Multilevel remote sensing investigation of Tundra surface variability in Utqiagvik, Alaska, Oral Presentation, *Annual Meeting of the American Geophysical Union*, Washington, D.C., Dec. 9-13, 2024.

Honors and Awards

Outstanding Leadership in Earth and Environmental Sciences Award, *2025*

- Awarded by the Vanderbilt University Department of Earth and Environmental Sciences to the graduating student who shows the greatest promise for success in a professional or academic career, holds leadership positions at Vanderbilt, and uplifts fellow students.

Cornelius Vanderbilt Scholarship, *2021-2025*

- Full tuition merit scholarship recognizing outstanding academic achievement and strong leadership skills.

Regeneron International Science and Engineering Fair Finalist, *2020*

- One of 1,600 finalists from a pool of 175,000 participants in the world's largest pre-college STEM competition.

National Merit Commended Scholar, *2020*

- Scored within the top 3% of PSAT/NMSQT test-takers nationwide.

Aspirations in Computing Award National Winner, *2020*

- Recognized by the National Center for Women & Information Technology as one of the top 40 female high school computer science students in the United States.

Professional Affiliations

Association of Polar Early Career Scientists, *2025 – Present*
International Association of Cryospheric Sciences, *2025 – Present*
American Geophysical Union, *2024 – Present*
Phi Sigma Rho - Alpha Eta Chapter, *2022 – Present*
National Center for Women & Information Technology, *2020 – Present*

Skills

Programming Languages: Python, R, Bash, MATLAB, C++, Java, NetLogo
Geospatial Software: QGIS, ArcGIS Pro, GeoDa, Google Earth Pro, GeoMapApp, QGroundControl
Field equipment/techniques: Lightweight deflectometer, Trimble GeoXH, ASD FieldSpec, tile probe, Kestrel 5500 Weather Meter, soil auger, inclinometer, vegetation quadrat
CAD and 3D Printing Software: Solid Edge, Autodesk Inventor, Ultimaker Cura, Bambu Studio