Nathalie Redick

CURRICULUM VITAE

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Education

MSc Geophysics (3.91/4.00) 2026
University of California, Davis *Davis, CA*

- **Thesis**: *Understanding Seismic Anisotropy Observations in the Context of 3D Slab-Induced Flow in the Cascadia Subduction Zone* (Advisor: Magali Billen)
- **Relevant Coursework**: Methods of Teaching Geology, Regional Synthesis of Geophysical & Geological Data for Geodynamic Modelling, An Introduction to Subduction Geodynamics Modelling, Fracture and Flow of Rocks, Earthquake Geology

BA Computer Science (3.75/4.00) 2023
McGill University *Montreal, QC*

- Minor in **Earth & Planetary Sciences**, Supplementary Minor Conc. in Computer Science (Data Science, Machine Learning)
- **Research Projects**: *Accessible Machine Learning For Geospatial Analysis; Using a U-Net to Identify Landslides* (Advisor: Jamie Kirkpatrick)
- **Relevant Coursework**: Earth Physics, Structural Geology, Volcanology, Data Science, Probability, Statistics, Applied Machine Learning, Probabilistic Programming.

Work Experience

Sept 2025–present **Graduate Student Researcher** @ UC Davis Datalab *Davis, CA*
- Working on virtual & augmented reality development in C++ for scientific analysis & visualization.
- Rebuilding organization documentation to improve accessibility & reach.

Sept 2024–Jun 2025 **Graduate Teaching Assistant** @ UC Davis *Davis, CA*
- Teaching assistant in the Dept. of Earth & Planetary Sciences
- Taught lab courses, field excursions, & dicussion sections in the Fall, Winter & Spring quarters

Jul 2023–Aug 2024 **Technology Analyst** @ Morgan Stanley *Montreal, QC*
- Worked collaboratively to provide agile metrics analysis for internal dev. teams globally, user support, & documentation.
- Utilized DB2 SQL, MongoDB, & Python to process metrics & maintain project infrastructure.

May–Aug 2022 **Data Science Intern** @ Esri Canada *Remote*
- Automated a workflow for updating national hydrography data using the Multi-Task Road Extractor deep learning model.
- Designed new input image layers & geomorphological indicators that improved the baseline model accuracy by ∼4%.

Papers & Talks[+]

1. [+] **Redick**, N. R. *(TBD) The Importance of Interoperable FOSS for Virtual Reality Applications in the Geosciences*. Campus Alliance for Advanced Visualization Conference (CAAV). *University of Maryland, Baltimore County*. https://thecaav.org (2025).
2. [+] **Redick**, N. R. *Intro to Machine Learning Tools & Applications for Geoscience*. Friday Lunch Talk. *University of California, Davis* (2025).
3. [+] **Redick**, N. R. *Science at Sea: Summary of the August 2025 PACSAFE & EXTEND Research Cruise*. Friday Lunch Talk. *University of California, Davis* (2025).

4. [+] **Redick**, N. R., Tarling, M. S. & Kirkpatrick, J. D. *Code-Free Deep Learning for Geospatial Applications*. AGU23. https://agu.confex.com/agu/fm23/meetingapp.cgi/Paper/1366363 (2024).
5. **Redick**, N. R. A Review of Pumice Raft Formation Environments, Saturation, and Dispersal Mechanisms. *McGill Science Undergraduate Research Journal* **18,** B19–B25. ISSN: 1718-0783. https://msurjonline.mcgill.ca/article/view/187 (2023).
6. [+] **Redick**, N. R. *Building an Accessible Machine Learning Workflow for Geospatial Analysis*. Open Research Symposium. *McGill Library, Montreal QC*. https://escholarship.mcgill.ca/concern/presentations/2n49t738j (2023).

Field Experience

Sept 2025 — *3 days*
Seismic Node Recovery/Redeploy — *Mt. Rainier & Mt. St. Helens, WA*
University of Oregon & USGS Cascades Volcano Observatory
- Assisted in the recovery of seismic nodes deployed in Aug 2025 along the Tahoma Creek drainage on Mt. Rainier.
- Assisted in the deployment of infrasound, field cameras, and 87 seismic nodes in a helicopter-enabled mission on Mt. St. Helens.

Aug 2025 — *20 days*
PACSAFE 2025 & EXTEND 2025 — *Offshore, BC*
NRCAN, University of British Columbia, University of Victoria, NFSI
- Partcipated as an Apply-to-Sail student aboard the CCGS John P. Tully to recover & deploy ocean bottom seismometers (OBS).
- PACSAFE OBS were recovered along the Explorer microplate off of Haida Gwaii & redeployed to the south of the 2024 field.
- EXTEND OBS were deployed along the Endeavour Ridge to complement existing cabled arrays.

Jul 2025 — *2 days*
Temporary Seismic Array Deployment — *Mt. Rainier National Park, WA*
University of Oregon & USGS Cascades Volcano Observatory
- Assisted a deployment of 53 seismic nodes in temporary arrays along the Tahoma Creek drainage to support studies of debris flows.

May 2025 — *1 day*
Field Assistant — *Jot Dean Cave & Pluto Cave, CA*
UC Davis
- Assisted in the collection of biofilm samples from lava tubes.

Oct 2022 — *7 days*
Graduate Volcanology Seminar — *Long Valley Caldera, CA*
McGill University
- Participated in a field seminar to study the volcanological features & geologic history of the caldera & associated features.

May 2021 — *16 days*
Field School I — *Death Valley, CA*
McGill University
- Produced maps of geologic units & structures in both Rainbow Basin, CA & Dublin Gulch, CA.
- Gained experience in structural field mapping, using a Brunton compass, & navigating with topographic maps.

Skills

Programming Languages	Python, Julia, C/C++, Java, DB2/SQL/MySQL, R, Bash, MATLAB, HTML/CSS, OCaml, (MIPS) Assembly
Field Techniques	Structural mapping, Brunton compass, field navigation & safety
Instrumentation	Temporary seismic nodes, broadband ocean bottom seismometers, field cameras, infrasound, rock saw
Software & Tools	Git, Linux/Unix, LaTeX, Jupyter, HPC, Slurm, QGIS/ArcGIS, ASPECT, Paraview, RESTful APIs, MongoDB, Jira, Jenkins, Liquibase

Teaching Experience

Apr–Jun 2025 **GEL 1: The Earth (TA)** *UC Davis*
- Guest lectured on the formation of the Earth & space.
- Led 1 hr/week of discussion on introductory earth science concepts.

Jan–Mar 2025 **GEL 101L: Structural Geology Lab (TA)** *UC Davis*
- Led 6 hours a week of lab on upper-division undergraduate structural geology concepts & assisted in field techniques/mapping excursions.

Dec 2024 **Introduction to Computational Pedagogy** *UC Davis Datalab*
- Two-day instructor training on evidence-based teaching, inclusive pedagogy, & instructional design for computational skills.

Sept–Dec 2024 **GEL 50L: Physical Geology Lab (TA)** *UC Davis*
- Led 6 hours a week of lab on introductory geologic concepts & field techniques; developed course material & updated lab lecture slides.
- Sample topics include mineral and rock identification, stratigraphy, tectonics, & glacial/surface processes.

Service & Leadership

Oct 2024–present **Datalab Affiliate** @ UC Davis Datalab
- Participate & assist in data science & computational pedagogy workshops.

Jan 2025–Jun 2025 **Student Mentor** @ Association of Women Geoscientists at UC Davis
- Assist a student in learning new skills, building job applications & CVs; discussing the science field & graduate school.

Feb 2025 **Field Trip Activity Leader** @ UC Davis
- Engaged 6th graders in discussions & hands-on experiences about characteristics of the 3 major rock types in the UC Davis rock garden.

Sept 2020–Apr 2023 **Vice President of Communications** @ Monteregian Society
- Managed communications for the undergraduate student council of Earth & Planetary Sciences at McGill University.

Scholarships & Awards

Early Career Program, UNOLS MSROC ($500) Dec 2025
- Travel & lodging funding to attend the 2-day early career program workshop ahead of AGU25.

Bogo Hack, MAIS Hacks 2022 Oct 2022
Best Design & Most Fun; Most Creative Game Dev Hack, McHacks9 Jan 2022
Best AI Hack for Art, MAIS Hacks 2021 Oct 2021
Geotop 2021 Scholarship Competition, Geotop ($1500) Jun 2021
Best Overall Hack, MAIS Hacks 2020 ($200) Oct 2020
Alma Mater Scholarship, McGill University ($3000) Sept 2019

Certifications

A-200 Mishap Review, Interagency Aviation Training (USGS) Aug 2025
A-110 Aviation Transportation of HazMat, Interagency Aviation Training (USGS) Aug 2025
A-100 Basic Aviation Safety, Interagency Aviation Training (USGS) Aug 2025
Workplace Hazardous Materials Information System (WHMIS), Aix Safety (Canada) Jun 2025
Wilderness First Aid, Sierra Rescue (Expires Nov 2027) Nov 2024
Epinephrine Auto-Injector Administration, Sierra Rescue (Expires Nov 2026) Nov 2024
Adult Child Infant CPR/AED & First Aid, Sierra Rescue (Expires Nov 2026) Nov 2024