Allison Enright

Microbial Geochemist

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Publications

am-enright

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About me

* I am an expert in complex problem solving, and as a geochemist and researcher, I design bespoke environmental monitoring technology to provide real-time data from the site, automate most data collection, and reduce the need for lab-based off site analysis.

* My background includes instrument design and prototyping, electrochemistry, sensor-based data collection, UV-vis spectroscopy, microbiology, geochemical and geophysical modelling, and signal processing.

* I am developing environmental monitoring and remediation technology that collects real-time feedback on geochemical conditions to assess the effectiveness of remediation treatments, and the stability of baseline geochemical conditions.

Education

2015 — PhD Microbial geochemistry — *University of Toronto*

- Thesis: Fluctuation Analysis of Oxidation-Reduction Potential in Circumneutral pH Iron-Oxidizing Microbial Systems
- In situ electrochemical characterization of biogeochemical reaction pathways

2011 — MSc Geodynamics — *University of Toronto*

- Thesis: Mechanisms of Extension in Eastern Anatolia
- Finite element modelling of tectonic processes

2010 — BSc Hons. Geology — *University of Ottawa*

- Thesis: Trace element chemistry of Thelon Formation fluroapatite cements

Work Experience

2020 – present — Assistant Professor of Environmental Geochemistry — *University of New Brunswick*

- Monitoring the effectiveness of remediation treatments is expensive, labour intensive, and has high uncertainty. I designed a sensor-based, in situ methods to get better quality, real-time information about critical biogeochemical processes. This technology is expected to reduce the timeline for assessing treatment effectiveness by at least 75%.
- Wrote and submitted proposals to federal, provincial, and local grant agencies, and was awarded over $680k in research funding.
- Using funds leveraged from successful grants, I renovated an asbestos-filled, unmaintained lab space, purchased all the necessary equipment and instrumentation to carry out my research, and completed the first biosafety certification in my building to undertake microbial experiments.
- Directed research carried out by 14 trainees by designing experiments, demonstrating and supervising lab and field techniques, advising on data collection, and collaborating on data analysis and communication of results.
- Designed one general geoscience and four specialist geochemistry courses for in-person and virtual delivery to over 300 undergraduate and graduate students.

2022 — Visiting Research Scholar, Astrobiology — *Harvard University*

- Designed microscope-mounted anaerobic miniature potentiostats.

2019 — Postdoctoral Scientist, Early earth habitability — *University of Tuebingen*

- Designed and coordinated a five-person team to perform early-Earth analog anaerobic sterilization experiments using a combination of microbial, mineralogical, and geochemical techniques.

2016 – 2018 — Postdoctoral Scientist, Astrobiology — *Rutgers University*

- Designed and performed experiments to isolate biological influences on physical and chemical sensor measurements (i.e., biosignatures) contributing to the development of the only reliable agnostic extant-life bio signature discovered to date.

2015 – 2016 — Postdoctoral Scientist, Biogeophysics — *Oklahoma State University*

- Designed and performed lab-based geophysical measurements targetting biological processes.