



Geochemical carbon dioxide removal for climate change mitigation

Applications are invited for M.Sc. and Ph.D. positions with Prof. Ian Power (Tier 2 Canada Research Chair in Environmental Geoscience) in the Environmental & Life Sciences Graduate Program at Trent University to research geochemical carbon dioxide removal.

In Canada, combustion sources at mines account for ~6 Mt CO₂/yr, agriculture contributes ~67 Mt CO₂/yr, and forests are net carbon sources. In addition to reducing these and other greenhouse gas (GHG) emissions, carbon dioxide (CO₂) removal from the atmosphere is necessary to abate hard to reduce emissions and mitigate climate change. Geochemical processes that sequester CO₂, including weathering and mineralization, can be accelerated in mining environments using mine wastes, agricultural fields and forests using mineral amendments, and engineered systems using reactive mineral oxides. While these approaches offer enormous capacities to capture and securely store CO₂, there are uncertainties relating to the rates of CO₂ removal that can be achieved, verification and quantification of carbon storage, co-benefits (e.g., improved plant growth), and environmental concerns (e.g., metal release).

Graduate student research will aim to address these knowledge gaps by discovering and developing geochemical CO₂ removal processes while aiding industries in deploying these negative emissions technologies. Research topics will be developed with the student in one of three themes: (1) CO₂ mineralization within mine wastes, (2) enhanced rock weathering, and (3) mineral oxide looping. Students will advance novel processes for CO₂ removal to facilitate society's transition to a net-zero carbon economy.



Prospective students should be motivated, preferably holding a degree in either Earth sciences, geology, geoscience, environmental science, chemistry, or closely related fields. The ideal candidate will have a strong academic standing, field and laboratory skills, excellent communication skills, strong work ethic, and a passion for science! Research experience at any level is highly advantageous. Please email Prof. Ian Power (ianpower@trentu.ca) about your research interests. Our lab is committed to an equitable, diverse, and inclusive workforce and welcomes all applications from qualified persons who may contribute to the further diversification of ideas and experiences.