

SUMMER RESEARCH 2024/25

PROJECT ABSTRACT



THE UNIVERSITY OF
WAIKATO
Te Whare Wānanga o Waikato

PROJECT # 51

SUPERVISOR/S:	Dr Thomas Corbett
PROJECT TITLE:	CO ₂ sequestration potential of agricultural soils amended with silicate rock powders as temperature changes
FIELD:	Soil Science/Earth Sciences/Environmental Sciences
DIVISION/SCHOOL:	HECS - Te Aka Mātuatua School of Science
PROJECT LOCATION:	Hamilton
EXTERNAL PARTNER:	NZAGRC

PROJECT ABSTRACT:

This project will investigate how the weathering of silicate rocks in agricultural soils can capture CO₂ from the atmosphere and how this process changes with temperature.

To answer these questions, we will incubate small masses of soil mixed with rock powder at different temperatures, measuring the inorganic carbon in both the soil mixture and CO₂ in the atmosphere of the incubation vessel.

STUDENT SKILLS:

- Laboratory experience
- Experience working with soil/rocks is advantageous
- Chemistry experience is advantageous
- Eye for detail/precision

PROJECT TASKS:

1. Setup and run incubation experiment. Mix soil with rock powder or sand, adjust water holding capacity to 80 %.
2. Measure headspace CO₂ on gas analyser.
3. Prepare samples for solid C analysis (dry and grind). Run samples on C/N analyser.
4. Collate data and analyse (i.e. difference in CO₂ concentration in incubation headspace, and inorganic carbon in the soil).

EXPECTED OUTCOMES:

- Student's Research Poster (as per clause 6 of the [Scholarship regulations](#))
- Student to develop capabilities to set up and run rock weathering experiments.
- Provide data to help establish the potential of silicate rock weathering in agricultural soils for CO₂ capture.
- Learn CO₂ (g) and soil carbon analytical techniques.

