

Methane formation at the Dun Mountain Ophiolite, Nelson Lakes, New Zealand

Date: Thursday 4 June 2015
Time: 3:00 pm to 4:00 pm
Location: Room 208, Level 2, Te Ao Marama Building, UC Campus

Joanna Pawson (Ngāti Kahungunu ki Wairarapa) grew up in both the Wairarapa and Whanganui, migrating south to begin her studies in Earth Sciences. Her project, supported by the Ngāi Tahu Research Centre, investigates methane emissions from the interaction between the rock, surface water and atmosphere from an exposed ophiolite outcrop in the Nelson Lakes region. She presented this research at the American Geophysical Union conference in December 2014 and has recently graduated from the University of Canterbury with her Masters in Science. She will now pursue a career in geo-science at Coffey Geotechnics, Christchurch.

Abstract:

The production of hydrogen (H₂) and methane (CH₄) related to olivine hydration (i.e. serpentinization) is considered a major contributor to natural hydrocarbon emissions on Earth. Serpentinization occurs during natural weathering of ultramafic rocks such as ophiolite outcrops, which are present on land masses worldwide. Numerous studies have assessed the potential hydrocarbon formation in the northern hemisphere (e.g. in Turkey, Greece, Japan, USA and Oman) but a limited number focus on the southern hemisphere. This study assesses the origin and flux of methane from a previously undiscovered site in the Dun Mountain Ophiolite Belt (DMOB), located at Red Hills, New Zealand. At distinct locations methane emits at considerable rates of 17,000 (in summer) and 730 (in winter) mg m⁻² day⁻¹ (two hundred times greater than background emissions). Extensive precipitation of carbonates also occurs at this site, with significant implications for considerable carbon dioxide (CO₂) sequestration. This multidisciplinary study demonstrates the interconnected nature of geological, biological and atmospheric interactions in ultramafic environments at low temperature on Earth.

<http://www.canterbury.ac.nz/future-students/student-profiles/student-profiles-by-subject/geology/joanna-pawson.html>