

JAMES RENNIE BEQUEST

REPORT ON EXPEDITION

Expedition/Project Name	'Testing the effect of soil moisture on rates of decomposition across tundra climate gradients'
Travel dates	25 th June – 22 nd August.
Location	Yukon Territory, Canada.
Expedition/Group Members	<ol style="list-style-type: none">1. Dr. Isla Myers-Smith, Chancellor's Fellow, University of Edinburgh2. Haydn Thomas, PhD student, University of Edinburgh3. Sandra Angers-Blondin, PhD student, University of Edinburgh4. Jakob Assmann PhD Student, University of Edinburgh5. John Godlee, Ecological and Environmental Science graduate, University of Edinburgh Eleanor Walker, Ecological and Environmental Science Undergraduate, University of Edinburgh.
Aims	<ol style="list-style-type: none">i) Conduct an independent research project, in which I will explore the relative impact of soil moisture on rates of decomposition.ii) Gain experience volunteering at the Kluane Lake Research Station.

OUTCOME (not less than 300 words):

Obtaining funding from James Rennie Bequest enabled me to join a research expedition led by Dr. Isla Myers-Smith, University of Edinburgh to explore the impact of climate change on vegetation in the Canadian Arctic. This expedition was of particular interest to me as Climate Change poses serious alterations to high-latitude ecosystems, and perhaps the most dramatic example of this is the greening of the tundra. The tundra is also a large store of terrestrial carbon, containing approximately 50% of global soil carbon stocks. Release of this carbon could act as a major positive feedback to climate change. In the field, I participated as a full member of the research team, primarily assisting with data collection and processing.

At present, it is unclear how interactions between temperature increases and soil moisture will affect decomposition rates in tundra soils. Levels of soil respiration are controlled by microbial activity and root respiration, factors that are primarily effected by temperature, water content and litter quality. For my independent research project, I used two different types of tea with contrasting decomposability. This enabled us effectively measure the effect of varying levels soil moisture on the rate of decomposition, whilst controlling for litter quality. This allows predictions to be made about the effect that shifts in soil moisture content might have on soil carbon stores in the tundra biome. Two experiments were set up using the Tea Bag Index protocol;

- i) **Manipulation:** Replicate areas were set up in an existent 'Common Garden', each are being subdivided into plots then watered at varying frequencies.

JAMES RENNIE BEQUEST

- ii) **Natural gradients:** Altitudinal transects was set up using four different treatments. This allows for a greater temporal and spatial scale, as well as seeing the relationship between decomposition and altitude

My primary concerns before I left were associate with the remote nature of the work that I would be doing. The research base at which we spent most of our time was situated three hours north of Whitehorse, in Kluane National Park. We also spent two weeks on Herschel Island, an uninhabited island situated off the north coast of Yukon Territory. Both locations were beautiful and I felt very lucky to be given the opportunity to visit places that very few have been to. All the expedition team got on well and I had a great time with all my teammates.

During the nine weeks that I was away I learnt many valuable skills that will be useful if I take part in another research expedition, but also that will be transferable in the future. Being surrounded by experienced researchers has enabled me to gain scientific knowledge that will be invaluable going into my final year at university. Being thrown into an intense working situation with a group of people that I don't know very well has taught me that it is possible to work with anyone, a skill that will be useful in future work situations.