JAMES RENNIE BEQUEST

REPORT ON EXPEDITION/PROJECT/CONFERENCE

Expedition/Project/ Conference Title:	Monitoring the Effects of Climate Change on Growth and Phenology of Plants in the Canadian Arctic
Travel Dates:	5th July 2017- 22nd August 2017
Location:	Kluane Lake, Yukon Territory, Canada
Group member(s):	Haydn Thomas, Cameron Cosgrove, Matthew Little
Aims:	To monitor phenology changes, measure growth and leaf traits, install time lapse technology and maintain the common garden experiment

OUTCOME (not less than 300 words):-

I spent 7 weeks throughout July and August of 2017 in Kluane Lake, Yukon Territory, Canada maintaining Dr Isla Myers-Smith's common garden experiment, as well as collecting data for Haydn Thomas' PhD project. The main aims of my summer were to maintain the garden, monitor the phenology changes, measure growth and leaf traits, as well as install time lapse technology.

To effectively maintain the garden, watering was done twice a week when it had not rained. Furthermore, shade cloth covering the shrubs was replaced and gravelled. The aim of this was to project the willows from damage in the coming years. We also did extensive weeding to ensure the presence of other groups of plants was minimised.

One of my other main tasks was monitoring the phenology changes of each individual. This was completed through a complete walk around of the garden twice a week. Each individual would be analysed to see if buds had grown or if it had grown leaves. The date of first bud appearance and first leaf appearance was recorded for each individual. Towards the end of the growing season, another analysis was completed regarding the senescence of the plants. The date where leaves started to brown was noted, followed by the date where all leaves were brown.

In the future, phenology will be also measured by time lapse cameras in and around the garden. I installed the cameras this year, positioned and programmed to take one picture every hour. The pictures can now be used for general monitoring of phenology and the garden as a whole.

I measured growth once per week. Each plant that had leafed out that year was analysed through the following measurements: 3 leaf lengths using callipers, 3 stem elongations using a measuring tape and canopy height to the tallest living leaf. I also noted the general health of the willow. Finally, I analysed leaf traits in detail carefully at various points throughout the growing season. To analyse leaves more precisely,

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2 leaves were taken from each individual and were weighed and photographed. The photographs were used for leaf area analysis in the program ImageJ.

Throughout these tasks, I learned how to format time lapse cameras, as well as use the program ImageJ. I also became extremely familiar with phenology and plant growth data collection. I look forward to taking these skills with me into my future studies.

I would like to thank the James Rennie Bequest for funding my travels to the Yukon. Without their support, I would not have been able to have such an incredible and informative summer research experience. After this summer, I feel much more confident in my field work abilities, as well as myself. Without the James Reenie Bequest, I would have not been able to grow as a scientist and person in such a short amount of time so thank you once again.