



University
of Victoria

Graduate Studies

Notice of the Final Oral Examination
for the Degree of Master of Science

of

ERIC COURTIN

BSc (University of Victoria, 2010)

“Snowfall Event Analysis at a Remote Northern Alpine Icefield”

Department of Geography

Wednesday, December 13, 2017

9:30 A.M.

Clearihue Building

Room B007

Supervisory Committee:

Dr. David Atkinson, Department of Geography, University of Victoria (Co-Supervisor)

Dr. Michael Demuth, Department of Geography, UVic (Co-Supervisor)

External Examiner:

Dr. Faron Anslow, Pacific Climate Impacts Consortium, UVic

Chair of Oral Examination:

Dr. Quentin Mackie, Department of Anthropology, UVic

Dr. David Capson, Dean, Faculty of Graduate Studies

Abstract

Data are presented from an automatic weather station on the Brintnell-Bologna Icefield that operated from August 2014 to August 2016 in Nahanni National Park. This location is notable for being the northernmost mass balance alpine study location of the federal glaciology program. At most of these sites - as for many glacier study sites - little is known about the link between atmospheric forcing at the synoptic scale and response at the glacier surface. In this region, many aspects of the physical processes controlling the interaction between atmospheric forcing and snowpack response are virtually unknown, especially at the daily to hourly timescale.

The character of snowfalls during the accumulation seasons for this icefield are investigated using high resolution time series from two acoustic snow depth sensors and other relevant meteorological parameters. It is found that the most drastic changes in snow depth occur from infrequent large snowfalls. Using an adaptation of an Environment Canada snow depth algorithm, snowfall events are identified and quantified based on a system of thresholds, running averages and ratios between the snow depth sensors. Synoptic conditions are examined using reanalysis and trajectory analysis to determine the moisture origin and pathway.