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

of

KYLE BEER

BSc (University of Victoria, 2015)

“Holocene Ecosystem Dynamics of a Central Vancouver Island Wetland: Development, Vegetation Change, and Carbon Accumulation”

Department of Biology

Friday, April 13, 2018
1:00 P.M.
Hickman Building
Room 120

Supervisory Committee:
Dr. Terri Lacourse, Department of Biology, University of Victoria (Supervisor)
Dr. Joseph Antos, Department of Biology, UVic (Member)
Dr. Rana El-Sabaawi, Department of Biology, UVic (Outside Member)

External Examiner:
Dr. Richard Hebda, School of Earth and Ocean Sciences, UVic

Chair of Oral Examination:
Dr. Karen MacKinnon, School of Nursing, UVic

Dr. David Capson, Dean, Faculty of Graduate Studies
Abstract

A multi-proxy paleoecological study that included pollen, microfossil, carbon (C), and nitrogen (N) analyses was conducted at a central Vancouver Island wetland to reconstruct the site’s developmental history, C and N accumulation rates, and surrounding vegetation community over the last 14,000 years. The paleoecological record shows that the lake that occupies the southeast corner of the wetland today was much larger during the late glacial period. Peat accumulation began through terrestrialization of the site, leading to vegetation and edaphic conditions characteristic of a bog or fen with variable water table depth inferred through testate amoebae and other microfossil remains. C accumulated rapidly during peat accumulation with maximum and mean accumulation rates of ~78 and 23 g C/m²/cal yr, respectively. The highest C accumulation occurred during deposition of herbaceous peat in the early Holocene, which, given the similarity to other Northern Hemisphere peatlands, suggests a strong climate forcing of C accumulation. N accumulation was an average of 0.64 g N/m²/cal yr during the terrestrial peat phase of the record. Regional forests consisted of a few distinctive phases. Pinus contorta dominated the surrounding open forests with Alnus viridis and Salix shrubs between at least 13,900 and 11,200 cal yr BP. Picea and Abies increased during Younger Dryas cooling (12,900-11,700 cal yr BP). Pseudotsuga menziesii was the most abundant tree species in the area during the early Holocene (11,200-7500 cal yr BP). Around 7000 BP there was a shift to Tsuga heterophylla forest, which continues to present.