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

of

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BA (Western University, 2014)

“Identifying and interpreting geoarchaeological sites with
high prospecting potential using aerial LIDAR, GIS and
sedimentological analysis”

Department of Geography

Friday, April 13, 2018
10:00 A.M.
Clearihue Building
Room B017

Supervisory Committee:
Dr. Ian Walker, Department of Geography, University of Victoria (Co-Supervisor)
Mr. Daryl Fedje, Department of Anthropology, UVic (Co-Supervisor)
Dr. Olav Lian, Department of Geography, UVic (Member)

External Examiner:
Dr. Darcy Mathews, School of Environmental Studies, UVic

Chair of Oral Examination:
Dr. Scott MacDonald, School of Health Information Science, UVic
Abstract

The dynamic environmental history and relative sea level (RSL) changes experienced on the Pacific Northwest Coast of North America during the early post-glacial period and the early Holocene resulted in significant visibility challenges for prospection of early coastal archaeological sites. Archaeological visibility is the degree to which cultural material survives post-depositional processes and is detectable on the landscape today. It is influenced by environmental factors such as localized differences in relative sea level change, the rainforest canopy and dynamic post-glacial activity. This study offers an integrated methodological approach for locating palaeo-coastal sites by combining: i) geomorphic interpretation of landscape attributes captured by LIDAR (Light Detection and Ranging) mapping, ii) GIS-based archaeological site potential mapping, and iii) local RSL history. The RSL history for the study site (Quadra Island, British Columbia, Canada) shows notable regression over the past 14 500 years from a highstand of 195 m resulting from post-glacial isostatic rebound. Late Pleistocene and early Holocene palaeo-shorelines are found inland from, and elevated above, modern sea level and represent key areas for archaeological prospecting. Bare-earth Digital Terrain Models (DTMs) derived from the LIDAR dataset were interpreted to identify palaeo-shorelines at 10 m and 30 m above modern mean sea level. A GIS-derived map was created to identify regions of high archaeological potential using a decision tree method with variables including distance to palaeo-shoreline, low slope and a coastal complexity parameter. Select geoarchaeological sites were examined in terms of sedimentology, stratigraphy, microfossil content and geochronology as site-specific examples of sea level regression stillstands. Field validation results suggest that this integrated methodology provides a promising approach for archaeological prospection that could be applied to other post-glacial coastal settings.