University of Victoria | Graduate Studies

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

of

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BSc (University of Victoria, 2013)

"Islands in a sea of nutrients: testing subsidized island biogeography"

School of Environmental Studies

Friday, January 26, 2018
3:00 P.M.
David Turpin Building
Room B255

Supervisory Committee:
Dr. Brian Starzomski, School of Environmental Studies, University of Victoria (Supervisor)
Dr. Morgan Hocking, School of Environmental Studies, UVic (Member)
Dr. Christopher Darimont, Department of Geography, UVic (Outside Member)

External Examiner:
Dr. Joseph Antos, Department of Biology, UVic

Chair of Oral Examination:
Dr. David Docherty, School of Exercise Science, Physical and Health Education, UVic

Dr. Stephen Evans, Acting Dean, Faculty of Graduate Studies

Abstract

Islands have typically been considered isolated entities, patches of habitat surrounded by an entirely inhospitable marine or aquatic environment. However, there is increasing evidence that islands are linked to the surrounding environment through the influx of subsidies. Subsidies can have impacts on island communities, and may alter the relationship between species richness and island area, a canonical relationship in the fields of ecology and biogeography. Little empirical work has been done to test these hypotheses in more productive ecosystems, however. To better understand the effects of the influx of marine subsidies on island ecosystems, I surveyed plant communities on nearly 100 small islands on the Central Coast of British Columbia. In Chapter 2, I focused on 1) how seaweed wrack subsidies affect the diversity of understory plant communities, 2) whether wrack subsidies affect the species-area relationship, and 3) whether the effect of wrack subsidies is mediated by landscape-scale habitat characteristics. To assess the support for these hypotheses, I selected from models that combined plant community data, remotely-sensed habitat characteristics, and shoreline wrack biomass. I used hierarchical models to provide further insight into the cross-scale influence of these factors on plot-scale responses. I found that wrack subsidies were associated with increased island-scale plant species richness. Although wrack subsidies did not alter the relationship between species richness and area on these islands, I found that smaller islands had higher levels of marine-derived nitrogen, indicating a greater influence of marine subsidies on the nitrogen pool of smaller islands. My results add to the weight of evidence that marine subsidies are drivers of large-scale patterns of species richness, and that the linkage between islands and the surrounding environment has implications for island communities.