



**University
of Victoria**

Graduate Studies

Notice of the Final Oral Examination
for the Degree of Doctor of Philosophy

of

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MEM (Royal Roads University, 2009)
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**“Exploring realistic immersive geovisualizations as tools for inclusive
approaches to coastal planning and management”**

Department of Geography

August 25, 2017
10:00 A.M.
David Turpin Building
Room B215

Supervisory Committee:

Dr. Rosaline Canessa, Department of Geography, University of Victoria (Supervisor)
Dr. Tara Sharma, Department of Geography, UVic (Member)
Dr. Cameron Owens, Department of Geography, UVic (Member)
Dr. Alexandrine Boudreault-Fournier, Department of Anthropology, Uvic (Non-Unit Member)

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Dr. Mark Lindquist, School of Natural Resources and Environment, University of Michigan

Chair of Oral Examination:

Dr. Michael Emme, Department of Curriculum and Instruction, UVic

Dr. David Capson, Dean, Faculty of Graduate Studies

Abstract

Effective coastal planning is inclusive and incorporates the variety of user needs, values, and interests associated with coastal environments. This requires understanding how people relate to coastal environments as 'places', imbued with values and meanings, and accordingly, tools that can capture place and connect with people's 'sense of place' have the potential for supporting effective coastal management strategies. Realistic, immersive geographical visualizations, i.e., geovisualizations, theoretically hold potential to serve such a role in coastal planning. However, significant research gaps exist around this application context. Firstly, place theory and geovisualizations are rarely explicitly linked in the same studies, leaving questions around the (potential) relationship between these tools and sense of place. Secondly, geovisualization work has focused on terrestrial environments, and research on how to realistically model coastal places is currently in its infancy. This dissertation aims to address these gaps by pursuing two research objectives. The first objective is to explore the 'human component' of geovisualizations, referring to how these tools operate within the social and cultural dimensions germane to environmental management plans and processes. In accordance with the discussion above, this exploration is framed through place theories and concepts, and regards realistic geovisualizations as 'place-based' tools. The second objective concerns the coastal context, and it involves elucidating the considerations around developing and using terrestrial-to-marine geovisualizations as tools for inclusive coastal planning and management.

The dissertation is composed of five manuscripts, which have been prepared as standalone articles for submission to academic journals. Each manuscript details a study designed to support an aspect of the research objectives, respectively serving (1) to develop a theory of geovisualizations as place-based tools, (2) to explore the theory in the coastal context, (3) to examine the relationship between sense of place and one's mental visualization of place, (4) to develop a coastal geovisualization under place-based considerations and examine its capacity for connecting to sense of place, and (5) to assess the geovisualization's potential as a tool for inclusive coastal planning efforts. The first and second study consist of literature review work. The third study involves a survey administered to residents of the Capital Regional District, which collected data for examining a potential relationship between the way people visualize coastal places and how they value and relate to these places. The fourth and fifth study involve developing a coastal geovisualization of Sidney Spit, and then employing focus groups to examine its ability for connecting with people's sense of place (i.e., fourth study) and utility as a tool for inclusive planning (i.e., fifth study).

Outcomes from the first study include a theory on how geovisualizations can function as place-based tools, and this was developed by integrating place concepts with ideas and conceptual models from human-media interaction and sense of presence research. The second study produced insight on how values and interests of different coastal user groups can influence understandings and perceptions of coastal places, and it used this insight to develop recommendations for coastal geovisualizations - full navigability, dynamic elements, and flexibility (i.e., allowing for continual modification and scenario building). The third study produced empirical evidence that place-based values and interests (i.e., framed through sense of place and concerns for place) can influence one's mental visualization of place in terms of the types of elements people include and perspectives they take in said visualization. The fourth study demonstrated that the presence of certain elements in coastal geovisualizations (such as people, dogs, birds, marine life, vegetation, and boats) can contribute to realism and sense of place; however, simultaneously, deficiencies in numbers and varieties of these elements can detract from realism and sense of place. In addition, the fourth study found that the incorporation of soundscape and viewshed elements is significant for the tool's ability to connect with sense of place. The fifth study demonstrated the geovisualization's usefulness for assessing certain qualities of management scenarios, such as aesthetics and functionality of fencing around a restoration area and potential viewshed impacts associated with locations of moored boats. The study also found that incorporating navigability into the geovisualization proved to be valuable for enhancing understandings around scenarios that hold implications for the marine environment because it allowed users to cross the land-sea interface and experience underwater places.