

Overview of Coastal Geohazard Studies, 2012

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Introduction

Coastal geohazard studies attempt to understand the effects of natural processes, the natural and anthropogenic decadal to millennial variability of these processes, and the impact of extreme events on public – private infrastructure and public safety. These studies are generally limited to areas where the proximity of people and infrastructure to the coast results in enhanced risk.

Specific projects are typically driven by the overall need to understand and apply coastal processes and where project outcomes enhance the department's ability to respond to internal and external client requirements. An emphasis has been placed on the need to apply geoscience to increase the safety and sustainability of public infrastructure. This includes providing support to the Nova Scotia Department of Natural Resources (NSDNR) Parks Branch, and information and analysis of other non-Natural Resources owned infrastructure. Other studies are undertaken where public requests for assistance are determined to fit within the overall goals of the department's environmental geology program.

Overview

Two major studies were undertaken during 2012 with detailed reports released as Open File Reports. These are *A Coastal Hazard Assessment of the Gabarus Seawall, Cape Breton County, Nova Scotia*, by Finck, P. W., Nova Scotia Department of Natural Resources, Open File Report ME 2012-002, 2012. and *Analysis of Spit-Beach Migration and Armour Stone Placement, and Recommendations for System Sustainability at Dominion Beach Provincial Park, Cape Breton County, Nova Scotia*, by Finck, P. W., Nova Scotia Department of Natural Resources, Open File Report ME 2012-003, 2012. Other smaller scale

studies and activities were undertaken but are not discussed in this overview.

The study of the Gabarus seawall was a response to requests from the local community of Gabarus to assess the safety of the existing seawall as the local community felt that the seawall was at risk of collapse. An assessment of the effect of past, present and future coastal processes and extreme events impacting the seawall was undertaken. The report and complete recommendations are available as noted above. It was determined that the seawall was at significant risk of sudden failure. Acting on this report, the province undertook additional engineering analysis of the structure through the Department of Transportation and Infrastructure Renewal. The preliminary assessment confirmed the results of the coastal geohazard assessment.

Dominion Beach Provincial Park has sustained significant storm related damage. This includes damage to infrastructure as well as significant and rapid changes to the natural environment of the park and associated beach and back beach systems. At the request of NSDNR's Provincial Parks Branch a geological and geotechnical analysis of the site was undertaken. The purpose was to assist in the development of a park redevelopment plan that would incorporate the impacts of long term coastal geological process and by doing so would enhance the sustainability of both park infrastructure and the natural features of the park. The report and complete recommendations are available as noted above.

The report format included discussion of various coastal processes and their effects on the physical nature of the park in addition to illustrative cross sections to assist park planners and engineers in designing the revetment, rubble mound, gravel walkways and raised wood walkway structures. Coastal geology, hazard and process information

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was utilized to allow for planning and construction of structures that will minimize impact on the coastal environment while maximizing sustainability. This analysis will reduce long term infrastructure maintenance and replacement costs.

Responsibility for detailed engineering plans and redevelopment of the Dominion Beach Park was tendered and has been awarded to CBCL Ltd. of Halifax.