Current trends of coastal evolution in Newfoundland and Labrador, Canada

MELANIE IRVINE

Geological Survey of Newfoundland Labrador, Department of Natural Resources, P.O. Box 8700, St. John's, Newfoundland and Labrador A1B 4J6, Canada

Geological, biological, and geographic characteristics are all partly responsible for variations in coastal sensitivity to environmental change in Newfoundland and Labrador. If the climate changes, there will be a modification of the impact of key variables that influence the evolution of coastal environments. For example, rising rates of relative sea level, changes in storm frequency and intensity, the extent and duration of sea-ice cover, and alterations in precipitation will change the geomorphic evolution of coastal environments. It is important to have an understanding of how coastal areas change and will change, as they have cultural, environmental, and economic significance, and critical infrastructure has been built there.

In order to better understand the evolution of coastal environments in Newfoundland and Labrador, and their vulnerability to flooding, erosion, and slope movement in the future, the Geological Survey of Newfoundland and Labrador initiated a coastal monitoring program in 2011. This program uses and extends a network of coastal monitoring sites established by the Geological Survey of Canada, which allows for a longer period of data evaluation. There are 112 beach and cliff sites in the program.

Results from this program indicate that erosion rates are variable, and can be rapid. High rates of cliff erosion have been measured in Point Verde, Holyrood Pond, and Point au Mal, whereas lower rates have been measured in Kippens, Sandy Cove, Norris Point, and in Conception Bay South. Dunes on the southwest coast in the Sandbanks and J.T. Cheeseman Provincial parks are also experiencing rapid rates of erosion. Coastal erosion is caused primarily by wind, waves, groundwater flow, and surface run-off. The effect of these agents on the evolution of coastlines is likely controlled by the interaction of factors that include sediment composition, beach, bluff, and nearshore geometry, orientation of the coastline towards the predominant storm direction, sediment budget, vegetation, and rate of relative sea level rise.

Atlantic Geology, 2015, Volume 51, Number 1
Geological Association of Canada Newfoundland Section Abstracts: 2015 Spring Technical Meeting
doi: 10.4138/atlgeol.2015.008