
**Sensitivity of intertidal and shallow marine environments
to climate change: a case study at the Morton
Environmental Centre, Heckmans Island, Nova Scotia**

K. BELLIVEAU¹, I. SPOONER² AND L. LUSBY³

*1. Program of Environmental Science, Acadia University, Wolfville,
NS B4P 2R6, Canada <045120b@acadiau.ca> ¶ 2. Department
of Geology, Acadia University, Wolfville, NS B4P 2R6, Canada
<ian.spooner@acadiau.ca> ¶ 3. Program of Environmental
Science, Acadia University, Wolfville, NS B4P 2R6, Canada
<linda.lusby@acadiau.ca>*

The Morton Environmental Centre, Heckmans Island, is a 40 ha field research station located near Lunenburg, Nova Scotia, that has 1.6 kilometres of coastline that can be characterized as a shallow marine environment. The effects of climate variability, in particular ocean water temperature fluctuations, rising sea levels, and the impacts of increased storminess (all proposed future climate scenarios) are not well known for shallow marine environments. This study evaluates the sensitivity of the shallow marine environment at the Morton Centre to various climate scenarios.

Physical characteristics of the nearshore marine environment were surveyed to determine: relative temperature, current activity, bathymetry, bottom substrate flora and sedimentology. The intertidal zone was characterized using longitudinal surveys to determine slope, percolation, and sediment type. Preliminary results of this survey indicate much variability in substrate composition and biological communities, that together influence sediment cohesion and susceptibility to movement. The complex nature of sediment distribution may be influenced by storm activity and seiche length, but is also influenced by tidal currents which were found to be quite strong at select sites. The intertidal zone is also variable with zones of intense erosion and deposition located in close proximity.

Future climate change scenarios predict increased and anomalous storm activity and rising sea level which, given survey results, could dramatically alter intertidal and nearshore morphology, sediment distribution and type in both of these zones. This in turn is projected to have a significant impact on ecology in this environment. The sensitivity model developed in this study will be used to develop management strategies for the site and has the potential to be transportable to other similar environments.