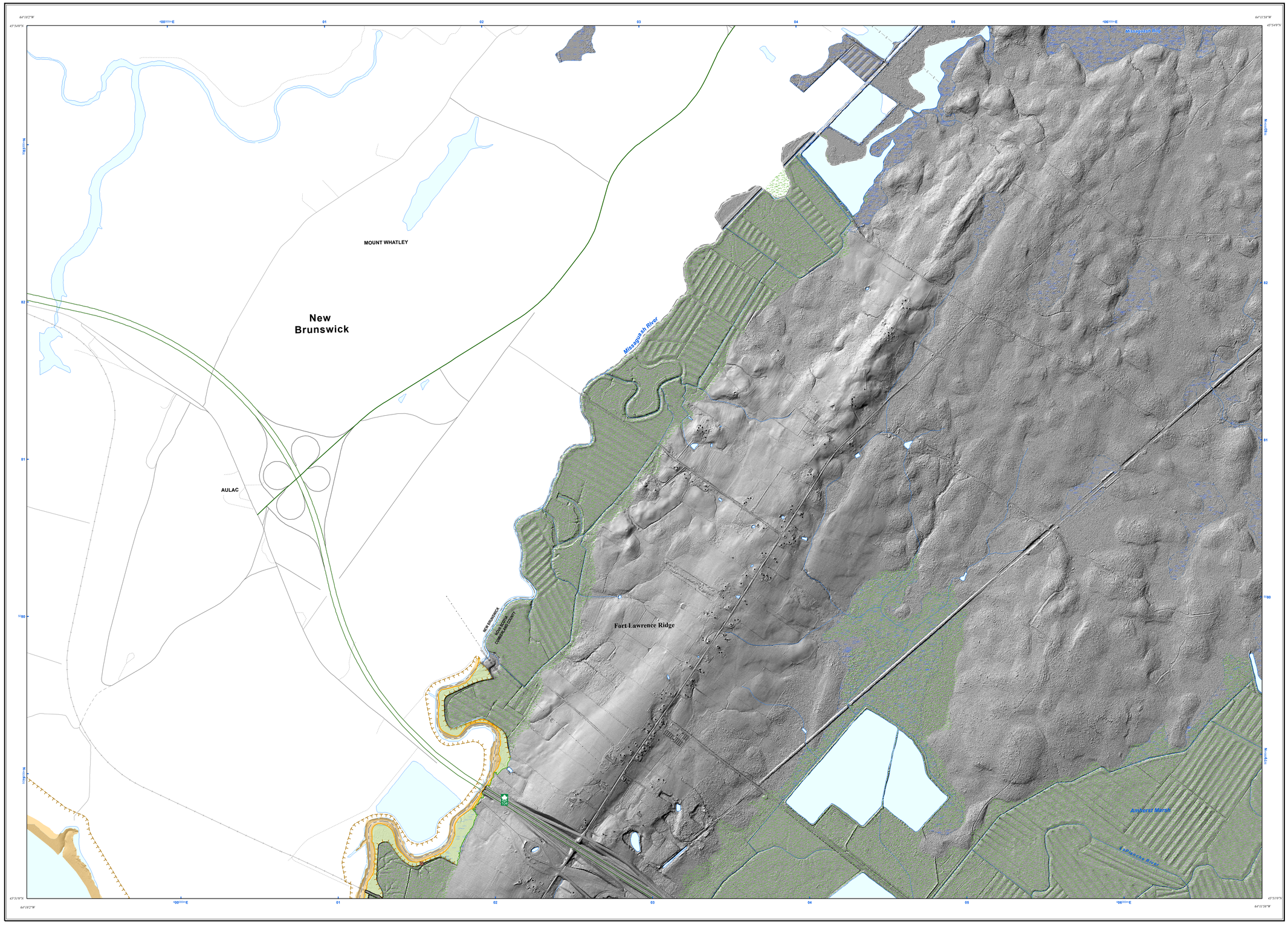


LEGEND*

Shore Zones

Backshore

- Highly stable
- Partially stable
- Not stable
- Unconsolidated over bedrock
- Other (bulkhead,causeway, road, wharf)
- Dyke

Foreshore (upper foreshore, middle foreshore, lower foreshore)

- Cliffed, highly stable
- Cliffed, partially stable
- Cliffed, not stable

Foreshore and Nearshore Habitats

- High salt marsh
- Low salt marsh
- Restored marsh
- Cobble
- Gravel
- Sand
- Mud
- Outcrop
- Platform

Symbols

- Nonagricultural aboiteau or culvert
- Agricultural aboiteau
- Shore protection or armouring
- Wharf
- End of ACASA study area

- Rock in water
- Building point location
- Arterial highway (102)
- Trunk highway (4)
- Collector highway (333)
- Hard surface road
- Loose surface/resource access road
- Trail, footpath, cart track
- Railway (active, inactive)
- Coastline
- River, stream
- County boundary
- Transmission line (multi, single line)
- Building footprint
- Wetland
- Lake/ocean
- Incorporated marsh body

* Note: Legend is for map series. All units and symbols may not appear on each map.

Explanation of Terms used in the Legend

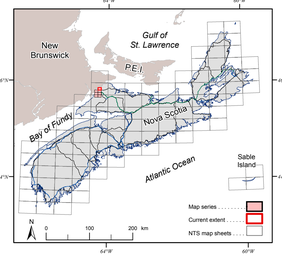
Backshore: the upper limit of high tide or storm wave levels (higher high water large tide), which is at an elevation of 7.57 m (Canadian Geodetic Vertical Datum of 1928 (CGVD28, land elevation vertical datum)) in the Southern Bight of the Minas Basin and 7.50 m (CGVD28) in the Cumberland Basin.

Foreshore: area between high and low tides which can be divided into **upper foreshore** (between the backshore and high marsh, close to the backshore), **middle foreshore** (between high and low marsh) and **lower foreshore** (the furthest extent of low marsh). The foreshore can be either ramped or cliffed where salt marsh is present.

- **ramped:** salt marsh that intersects the intertidal flat as a gently sloping vegetated surface.
- **cliffed:** salt marsh that intersects the intertidal flat as a cliff >30 cm and a slope >20°.
- **highly stable:** no visible signs of erosion.
- **partially stable:** visible signs of erosion including cliffing, however very little to no vegetation slumping away from the shoreline.
- **not stable:** significant visible signs of erosion including cliffing, with vegetation slumping away from the shoreline.

The **foreshore and nearshore habitats** are defined as follows:

- **high salt marsh:** a marsh covered only by highest high tides and storms with some soil development, organic build up and a high diversity of plant species dominated by grasses and shrubs (Owens, 1994).
- **low salt marsh:** a marsh covered by all moderate and high tides and characterized by little soil development, low species diversity, hydrophilic and often halophytic pioneer species (sedges, glasswort) and discontinuous cover (Owens, 1994).
- **restored marsh:** a site where the natural hydrology has been restored, enabling the re-establishment of high salt marsh and floodplain wetland habitat conditions.
- **cobble:** a rock fragment larger than a pebble and smaller than a boulder, being somewhat rounded or otherwise modified in the course of transport (Bates and Jackson, 1980) (6-256 cm, Wentworth, 1922).
- **gravel:** an unconsolidated, natural accumulation of rounded rock fragments, resulting from erosion, consisting predominately of particles larger than sand (diameter >2 mm) (Bates and Jackson, 1980).
- **sand:** a rock fragment or detrital particle smaller than a granule and larger than a coarse silt grain, or that at the lower limit of visibility of an individual particle and that of the head of a small wooden match (Bates and Jackson, 1980) (0.0625-2 mm, Wentworth, 1922).
- **mud:** a mixture of water and silt or clay-sized earth material with the consistency ranging from semifluid to soft plastic; a wet, soft soil or earthy mass, mire or sludge; an unconsolidated sediment consisting of clay and/or silt, together with other dimensions (sand), mixed with water, without connotation as to composition (Bates and Jackson, 1980) (<0.0625 mm, Wentworth, 1922).
- **outcrop:** a low to moderately sloping (<40°) surface extending seaward from the backshore composed of bedrock.
- **platform:** a horizontal or gently sloping surface (<10°) extending seaward from the intertidal zone, formed on rocky or rock-cliff shores by wave impact and erosion. The surface may be bare or littered with rock.
- **shore protection or armouring:** any material (rock, wood, car bodies) thrown together irregularly or fitted together to prevent erosion by waves or currents and thereby preserving the surface, slope or underlying structure (i.e. rip rap) (Owens, 1994).



Descriptive Text

Human settlement in environments as dynamic as the coastal zone will inevitably lead to conflict between the natural variability of the coastal environment and the economic, social and cultural activities taking place within it. Managers and planners need to have access to better information about tidal rivers, coastal processes and dynamics to ensure informed decision making. This requires up-to-date shore zone characterization, an understanding of the boundaries of coastal processes and historical rates of coastal change. A segmentation model was developed using ArcGIS® 10 to delineate and characterize the backshore (upper limit of high tide), foreshore (area between low and high tides) and nearshore (low water line out to sea, but shallow) zones within the Cumberland Basin and Southern Bight of the Minas Basin in the Bay of Fundy, Canada. Multiple shorelines were chosen to reflect the hyper-tidal conditions (>14 m tides). Data were collected during shoreline surveys using a YUMA tablet. In areas where it was unsafe to conduct shoreline surveys, aerial imagery was used. Segments of the shoreline were characterized and catalogued using a customized decision key. Areas of the coast were assessed for shoreline stability, presence or absence of cliffs (consolidated and unconsolidated) and anthropogenic structures.

There are 15 maps in the Southern Bight of the Minas Basin study area and 7 maps in the Cumberland Basin study area. Maps are at a scale of 1:10 000. This project was completed within the Maritime Provinces Spatial Analysis Research Centre (MP_SpARC) with collaboration from the Nova Scotia Department of Natural Resources (NSDNR).

Map Notes

GIS shoreline database produced by Danika van Proosdij and Barbara Pietersma-Perrott of Saint Mary's University, Maritime Provinces Spatial Analysis Research Centre. Data collected from June 19, 2010 to July 8, 2011.

Cartography and reproduction by Angie Ehler of the Nova Scotia Department of Natural Resources, Geoscience Information Services Section, 2011-12. The maps were developed using ArcGIS® 10.

Universal Transverse Mercator Projection (UTM), Zone 20, Central Meridian 63°00' West. North American Datum (NAD) 1983 Canadian Spatial Reference System (CSRS) 98.

Base and digital data derived from the Nova Scotia Topographic Database (NSTDB). Copyright Her Majesty the Queen in Right of the Province of Nova Scotia. The NSTDB is available from Service Nova Scotia and Municipal Relations (SNSMR), Land Information Services Division (LIS), Nova Scotia Geomatics Centre (NSGC), Amherst, Nova Scotia.

Dyke, aboiteau survey data and incorporated marsh body data from the Nova Scotia Department of Agriculture, Resource Stewardship Land Protection. Wharf structures derived from the Nova Scotia Topographic Database (NSTDB), Nova Scotia Coastal Series.

Shaded relief image derived from a 2 m lidar bare-earth digital elevation model, azimuth of 315°, sun angle of 45° and a vertical exaggeration of 5. The lidar was acquired by the Applied Geomatics Research Group, Nova Scotia Community College during a single mission on October 29, 2009. All data acquired using an Optech ALTM 3100 lidar sensor; see Webster *et al.* (2011) for further details on the lidar processing, surface construction and accuracy validation.

Nova Scotia Department of Natural Resources
Mineral Resources Branch

Open File Map ME 2012-017

Shore Zone Characterization Map of the Fort Lawrence Ridge Area, Cumberland County, Nova Scotia

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*Maritime Provinces Spatial Analysis Research Centre, Saint Mary's University, Halifax, Nova Scotia

Scale 1:10 000

0 0.5 1 km

Halifax, Nova Scotia
2012

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Acknowledgments

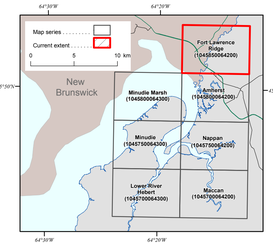
This project is part of the Atlantic Climate Adaptation Solutions Association (ACASA) project, a joint undertaking between the Atlantic Provinces, Natural Resources Canada, regional municipalities and other partners. It was made possible with funding from the Province of Nova Scotia and federal support from Natural Resources Canada's Regional Adaptation Collaborative Program.

Disclaimer

The information on this map may have come from a variety of government and nongovernment sources. The Nova Scotia Department of Natural Resources and partners of the Atlantic Climate Adaptation Solutions Association do not assume any liability for errors that may occur. This map is intended for use at the published scale of 1:10 000.

Recommended Citation

van Proosdij, D. and Pietersma-Perrott, B. 2012: Shore zone characterization map of the Fort Lawrence Ridge area, Cumberland County, Nova Scotia; Nova Scotia Department of Natural Resources, Mineral Resources Branch, Open File Map ME 2012-017, scale 1:10 000.



Atlantic Climate Adaptation Solutions Association
Solutions d'adaptation aux changements climatiques pour l'Atlantique

Natural Resources Canada / Ressources naturelles Canada

Series or Map Name

Open File Map ME 2012-017

Jun 28, 2012