Coastal Monitoring in Newfoundland and Labrador

Newfoundland Labrador
Natural Resources

Why Monitor Coasts?

Over 90 % of the population of the province lives near the coast. Coastal environments are always changing and can be at risk from flooding, erosion and slope movement. These changes commonly impact people or infrastructure and it is therefore important to understand the rate of change, the factors causing change, and which areas are at high risk from coastal hazards.

Coastal erosion undercutting a road in O'Donnells.

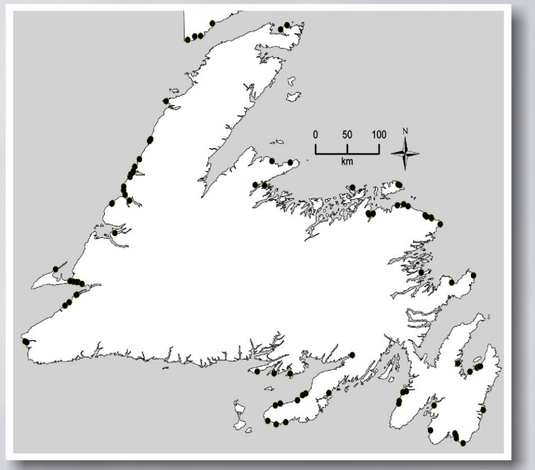
How Do We Monitor Coasts?

Studies of coastal sites involve topographic surveys using RTK, or Real Time Kinematics, equipment that collects very precise location data. Key coastal features such as the top and base of cliffs, beach crests, and transects down the beach (to monitor changes in sediment volume) are surveyed. Data are imported into a GIS and analysis performed.

RTK equipment has three main components: A base station, radio link and roving GPS receivers. The base station is set up over a survey marker. The base station sends its reference position to the roving receiver through the radio, allowing for the position of the rover to be corrected.

Red survey pins are installed at the landward end of transects. A transect, shown by the red line, is surveyed from the pin to the water. By comparing surveys of different years, changes in the site can be accurately determined.

Coastal Monitoring Program



Coastal monitoring sites shown by black dots.

The Geological Survey is conducting a long-term coastal monitoring program. Eighty-eight sites have been established and include beach and cliff areas. The sites will be surveyed over many years, and from these results an assessment of rates of shoreline erosion, changes in beach profiles and an identification of areas at risk from flooding, slope movement and erosion will be made.

Case Study: Point Verde

Cliff at Point Verde in 1995, 2005 and 2012. Note the concrete structure, shown in the top two photos, is now at the base of the cliff.

Point Verde is a gravel peninsula which provides protection to Placentia from coastal storms. There is a lighthouse on the northern end, residential houses on the inland side, and an active aggregate operation. The peninsula is eroding, and if the site is breached, the area, including Placentia, could be at greater risk from coastal storms.

Cliff top in 1991 (black), 2000 (blue) and 2012 (pink) superimposed on an airphoto. Cliff erosion varies between 0.5 m/a to 1 m/a.