



PROJECT DESCRIPTION

The Township of Tiny is developing a master plan for Lafontaine Beach Park on Georgian Bay. As a key part of this plan, Coldwater Consulting Ltd. was contracted to undertake a study of the implications of the removal of existing groynes, boulder and cobble from the shore in order to improve conditions at the beach. Coldwater's work included an overview of conditions, evaluation the processes affecting water quality in the nearshore, evaluation of design alternatives, development of a recommended design and provision of an assessment of the feasibility and effectiveness of a physical solution to nearshore sediment and water quality problems. This work provides technical documentation to a Municipal Class Environmental Assessment being undertaken because of potential effects on fish habitat, beach stability and water quality from the proposed changes to the nearshore.

CLIENT

The Township of Tiny
Tiny, ON

LOCATION

Lafontaine Beach, ON

DATE

2010-2012

PROJECT APPROACH

After an initial site investigation, it was apparent that poor water quality conditions at Lafontaine Beach Park were the results of very low flow circulation caused by a combination of septic field leachate, ad-hoc groynes and the recent low level of Lake Huron, which exposed a large, stable offshore bar. Water levels and this offshore bar have a strong interaction, especially at low lake levels, when the bar is an almost complete barrier preventing both freshwater exchange and wave action. At higher levels, the bar becomes less influential, but circulation at the beach is restricted by the presence of the adjacent groyne field.

Coldwater performed a series of numerical modelling studies to investigate the impact of a number of groyne removal options on water and sediment circulation. There included regional wave modelling, local wave-induced circulation modelling and sediment transport modelling. The results showed that partial removal of the groynes is almost as effective as complete removal in improving water quality at the beach.

The study recommended partial removal of the one groyne immediately to the west of the beach and placement of the sediments from the groyne to form a sediment cap over the existing fine, organic sediments on the beach. To enhance aesthetics, it was proposed that boulders be used to create habitat features at either side of the beach to help anchor beach sediments while providing habitat.