Township of Tiny
Public Meeting, 6 Nov. 2010

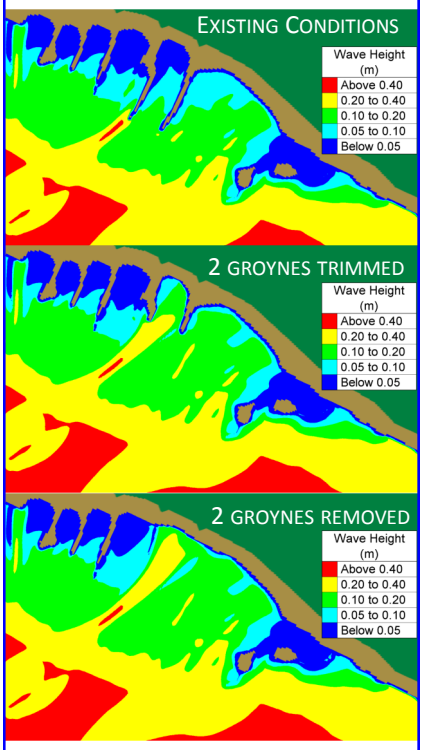
Lafontaine Beach Park Master Plan: Coastal Engineering Analysis
Feasibility of Groyne Removal

FINDINGS

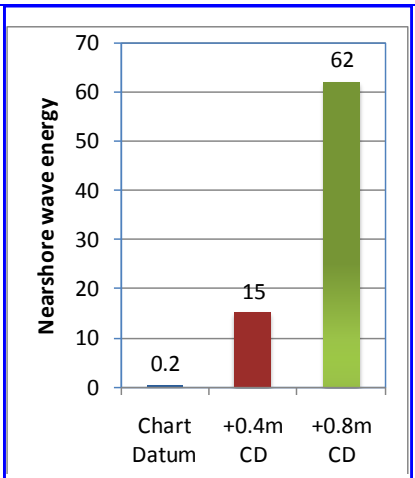
The following summarizes our findings of an investigation into water quality at Lafontaine Beach Park.

1. Water and beach quality in the nearshore of Lafontaine Park is degraded
2. Septic leachate and urban runoff are the major sources of nutrient loading and are the source of water problems at the site
3. The geography of the site – a sheltered embayment and a large, stable offshore bar exerts a controlling influence on wave and circulation conditions. This minimizes the overall impact that removal of the groynes can have.
4. Water levels vary by 1.5m on a decadal basis due to changes in hydrologic inputs. This has the largest impact on circulation.
5. Combined effects of bar and water levels:
   - Low Levels: The bar is an almost complete barrier preventing both freshwater exchange and wave action.
   - Average Levels: Circulation and wave action improve as more of the groynes are removed. The majority of improvement comes from removing the outer 80m of the 2 groynes immediately to the west of the park
   - High levels: The levels of circulation and wave action that would occur with the existing groyne geometry are relatively quite high, and further improve with groyne removal.
6. Longshore transport of sediments bypasses the inner bay, carrying sediments carrying sediment along the offshore bar from Ipshiming Bay to the west to the spit immediately east of the park .
7. Groynes provide shelter from wave action and restrict circulation
8. **Changes to the groynes have been shown to increase circulation and wave action – partial removal is almost as effective as complete removal**
9. Complete removal of the two groynes:7,500 m^3 of material. Trimming the ends of the two groynes: 2,700 m^3 of material.
10. Compared to complete groyne removal, partial removal of the two groynes to the west of Lafontaine Beach Park achieves 3/4 of the benefits while only requiring 1/3 of the excavation.
11. Rank of influences on nearshore water quality:
    - Nutrient loading from residential development
    - Low water levels
    - Offshore bar
    - Groynes

    However, it is the groynes are the most readily modified of these 4 elements.



Nearshore wave action increases if groynes are trimmed or removed.



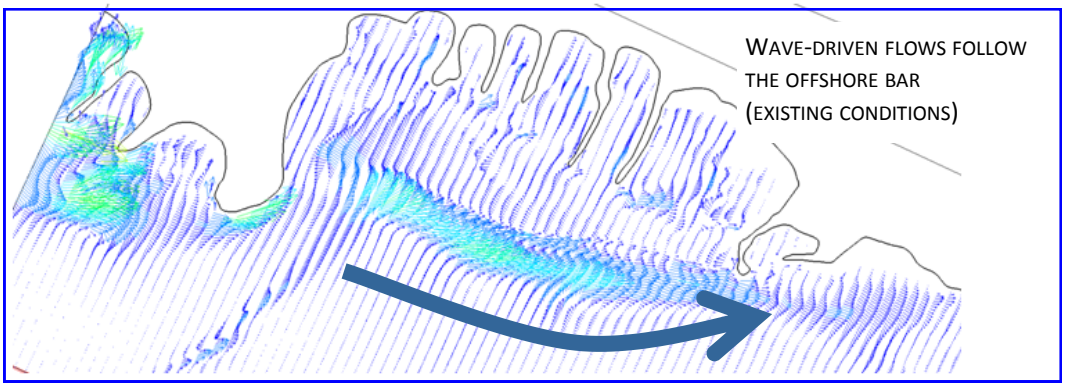
WAVE ACTION AT THE PARK INCREASES DRAMATICALLY WITH WATER LEVEL

CAVEATS

1. This analysis is focussed on conditions along the park shoreline. Effects on adjacent shores have not been analyzed.
2. A detailed nutrient / water quality modelling exercise has not been undertaken.
3. **Changes to the groynes don't affect the fundamental challenges posed by the supply of nutrients to the bay (urban runoff), nor the blockage provided by the offshore bar.**

FURTHER REQUIREMENTS

These are the results of a feasibility assessment. The development of a final plan and implementation is dependent upon public input, permitting approval and detailed design work.



WAVE-DRIVEN FLOWS FOLLOW THE OFFSHORE BAR (EXISTING CONDITIONS)

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