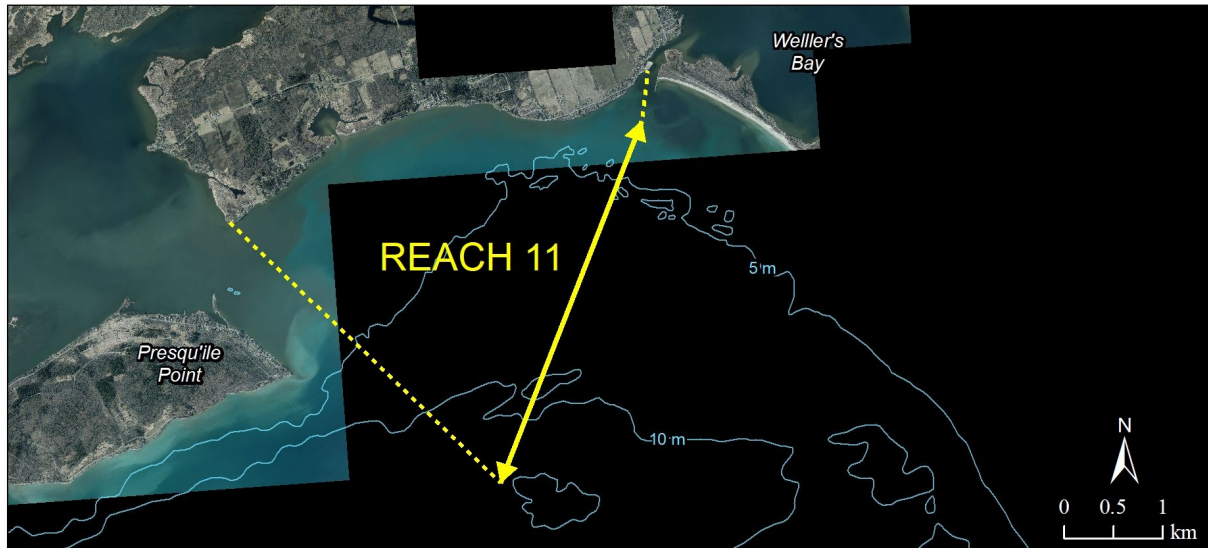


Reach 11 – Shoal Point to Wellers Bay



Local Conditions

- Reach Length = approximately 16 km.
- The shoreline is extensively developed with permanent and seasonal homes. A significant percentage is already armoured with a variety of shoreline protection structures.
- Boat Harbour is a large sheltered embayment with a natural shoreline.
- Two sections of Barcovan Beach Road are very close to the waters edge and should be monitored.
- The development along Evergreen Lane is located on lands below the 100-year flood level and extremely vulnerable to flooding during high lake levels and storms. A long-term community scale mitigation strategy is needed for this community.

Flood Prone Properties, Evergreen Lane (May 2019)

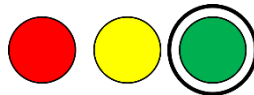


Exposed Bedrock Shoreline, Barcovan Beach Road (November 2018)

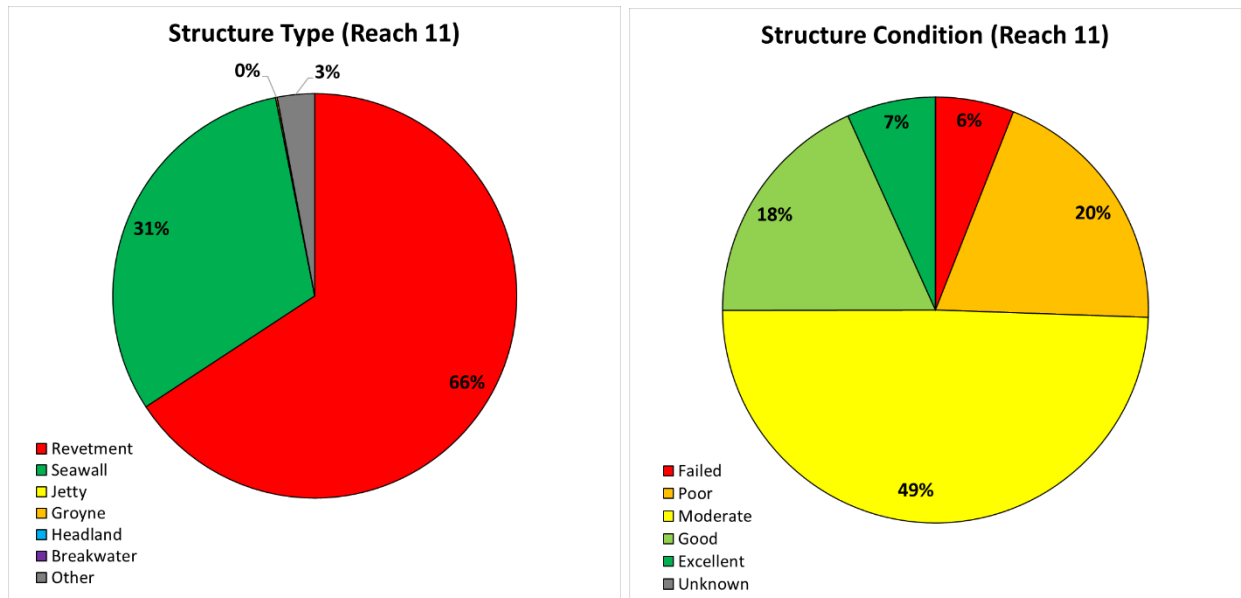


Shoreline Structures

- Reach 11 is 74% armoured, 26% natural.
- The vast majority of Reach 11 is privately owned, hardened shoreline, with a wide range of shore protection types, levels of design and condition.
- Most structures fall under the revetment (boulder or armour stone) or seawall (concrete or stacked armour stone) categories.
- Most structures (65%) are moderately to well-engineered and in moderate to good condition.
- 35% of protection structures are ad-hoc, many of which are in poor condition.
- West of boat harbour, shore protection is generally founded on sandy lakebed. East of boat harbour along Barcovan Beach Road the shore protection is generally founded on exposed bedrock. A highly erodible layer of native soils sits atop the exposed bedrock, with unprotected properties suffering significant and ongoing erosion as a result.
- Tolerance for additional shoreline armoring (low/medium/high):



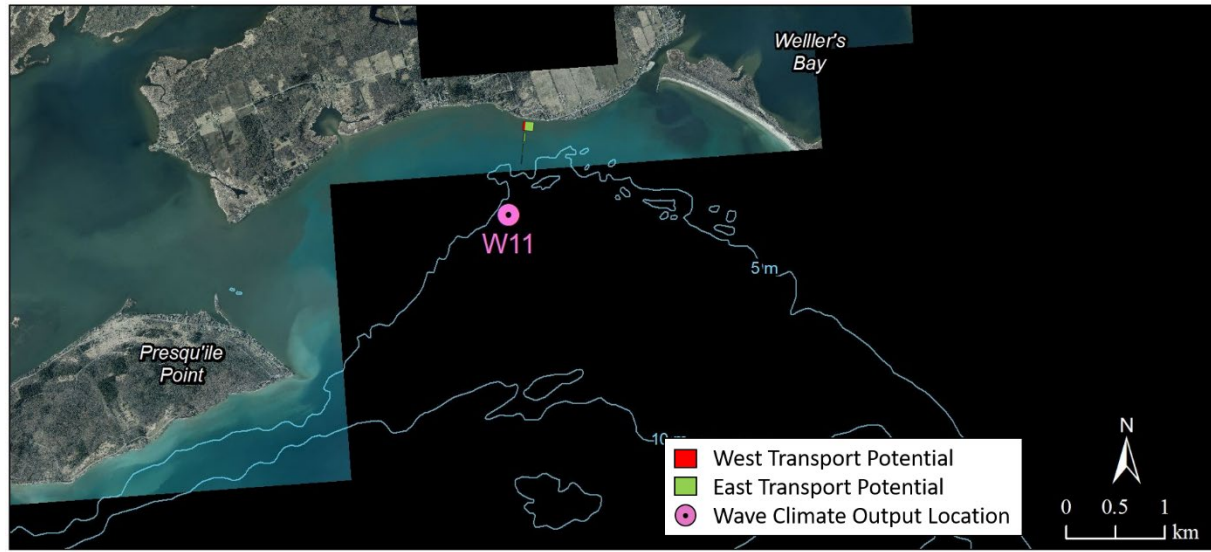
- Sample statistics (for armoured portion of shoreline):



Sediment Supply and Longshore Sediment Transport

- Sediment transport in Reach 11 is generally from west to east, with the net transport potential being on the order of 15,000 to 20,000 m³/year.
- The actual transport may be upwards of 50% of the potential as the majority of the nearshore features an extensive sand deposit that is mobilized during significant wave events. The movement of sediment is likely in a narrow band near the shoreline.
- The principal depositional areas in Reach 11 are the Boat Harbour barrier beaches in the western half of the reach and the entrance to Weller's Bay at the east end of the reach.

The Weller's Bay navigation channel is dredged with some frequency to maintain navigable depths.



Summary of Natural Hazards

- 100-year Erosion Rate (Stable Slope not included):

Start (lat, long)	End (lat, long)	100-year Erosion Rate (m/year)	Bluff Crest or Waterline
44.0132, -77.6784	44.0179, -77.6704	0.23	Waterline
44.0204, -77.663	44.0242, -77.6289	0.23	Waterline

- 100-year Flood Level and Flood Hazard Limit (including wave uprush):

Start (lat, long)	End (lat, long)	100-year Flood Level (m IGLD85')	Flood Hazard (m IGLD85')
44.0118, -77.6827	44.0210, -77.6471	+76.03	+77.81
44.0210, -77.6471	44.0221, -77.6320	+76.03	+77.58
44.0221, -77.6320	44.0242, -77.6290	+76.03	+77.91

- Dynamic Beach(es):

Start (lat, long)	End (lat, long)	100-year Erosion Rate (m/year) or Stable	Dynamic Beach Name
44.0179, -77.6704	44.0204, -77.663	0.23	Boat Harbour Barrier Beach

- Wave climate ~1 km offshore (output location W11):

ARI (years)	Depth (m)	Hs (m)	DIR (deg)	Tp (s)
5	7.2	2.38	198	10.5
10	7.2	2.41	198	10.5
25	7.2	2.45	198	10.5
50	7.2	2.47	198	10.5
100	7.2	2.48	198	10.5

Infrastructure and Ecosystem Threats

- Evergreen Lake/Shoal Point community is below the 100-year flood hazard limit.

- Clifford Street and Barcovan Beach Road are vulnerable to erosion in locations.
- At entrance to Wellers Bay, Barcovan Beach Road is in the 100-year flood hazard limit.

Shoreline Management Recommendations

- Evergreen Lane/Shoal: existing development requires floodproofing at the community scale, including ensuring safe ingress/egress and functioning private septic systems, or managed re-alignment/retreat for the entire community.
- Monitor and maintain existing shoreline protection structures throughout reach.
- Monitor shoreline erosion at Clifford Street and Barcovan Beach Road where shoreline is in proximity to bluff crest and within the erosion hazard setback.
- Upgrade roads that are below the 100-year flood hazard limit including Barcovan Beach Road at the entrance to Wellers Bay.

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