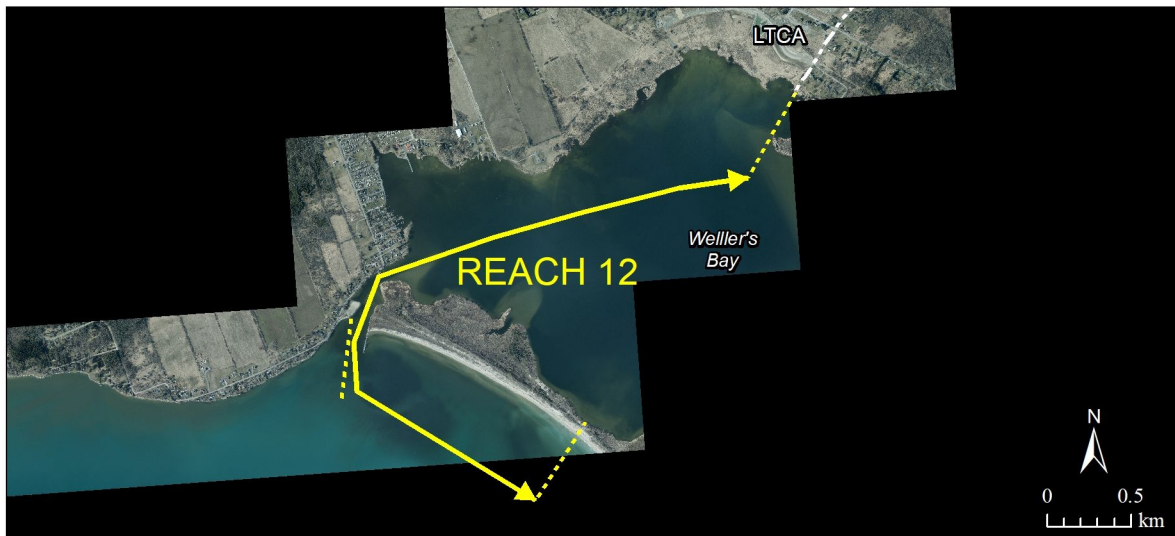


Reach 12 – Wellers Bay and Barrier Beach



Local Conditions

- Reach Length = approximately 3 km.
- Low energy shoreline sheltered from Lake Ontario wave action.
- Mixture of natural shoreline with coastal wetlands and high-density development.
- Single rock jetty protects the navigation channel to the bay. Sediment that accumulates in the channel is dry-docked and disposed upland.
- Wellers Bay and the barrier islands were established as a National Wildlife Area in 1978 for the rare coastal habitats including natural beach, sand dunes, wetlands, and deciduous forest. The habitat is used by migratory waterfowl, nesting shore birds (see adjacent Belted Kingfisher), and several federally listed species at risk.



Armoured Shoreline at Trailer Park

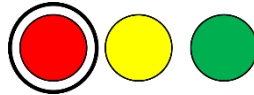


Entrance to Wellers Bay

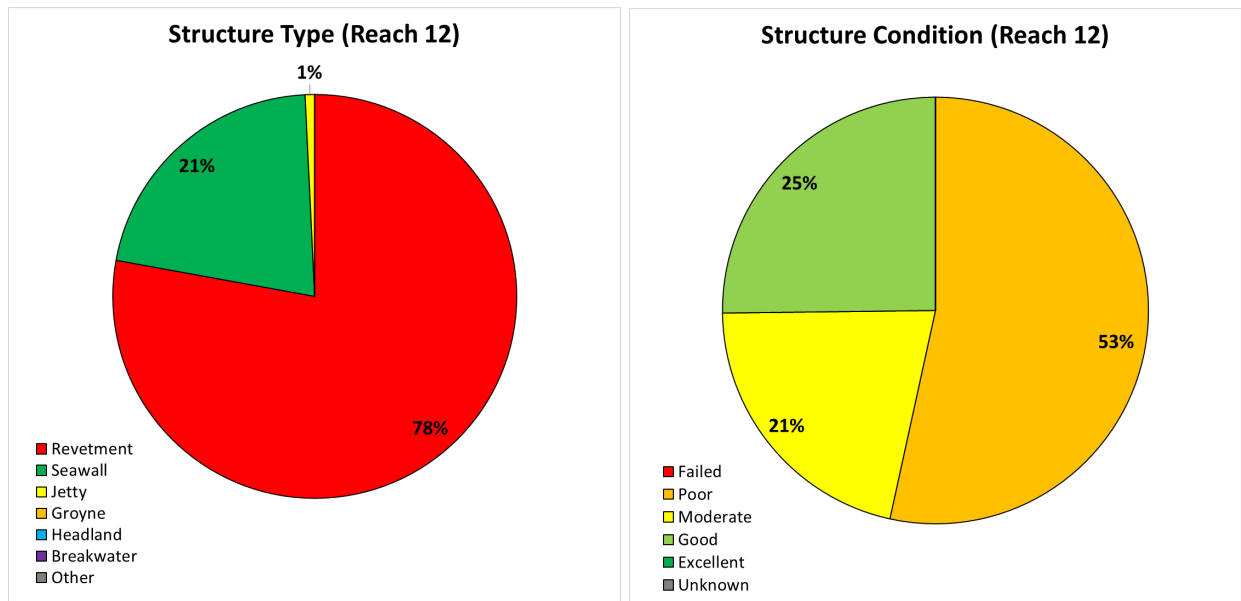


Shoreline Structures

- Reach 12 is 22% armoured, 78% natural.
- Shoreline protection is limited to the north shore of the entrance to Wellers Bay and the east facing shoreline along Carter Road, which is primarily occupied by private cottages and trailer parks.
- Most shoreline armoured is ad-hoc quarried stone or boulder revetments and concrete seawalls. Most structures are in poor to moderate condition; however, this is primarily due to age and not wave or ice related damage. Protection structures are exposed to little wave action.
- The Wellers Bay barrier beach complex is anchored by a 220 m long rock jetty on the east side of the Wellers Bay navigation channel. The jetty is in a state of deterioration and requires upgrades to be effective in mitigating sand and wave transmission into the navigation channel.
- Tolerance for additional shoreline armoured (**low/medium/high**):



- Sample statistics (for armoured portion of shoreline):

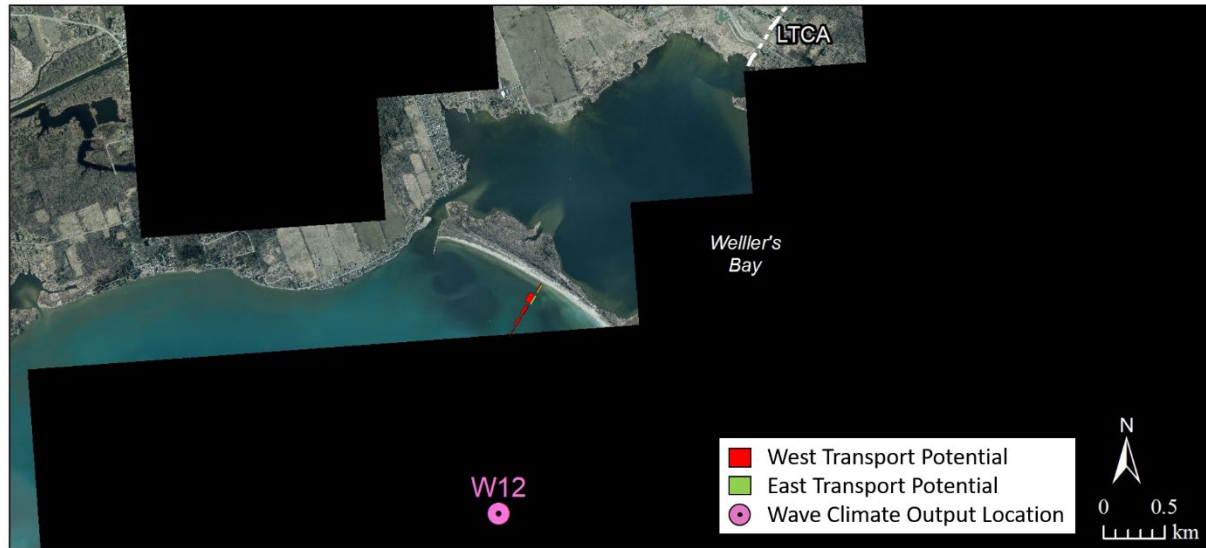


Sediment Supply and Longshore Sediment Transport

- Sediment transport is limited to the exposed portions of Reach 12 such as the Wellers Bay barrier beach complex and navigation channel.
- Sediment is driven into and deposited within the Wellers Bay navigation channel from Barcovan Beach Road to the west (Reach 11).
- The net sediment transport potential along the exposed portions of the Wellers Bay barrier beach complex is from southeast to northwest (towards the Wellers Bay navigation channel). The potential transport rate is on the order of 10,000 m³/year. This

material moves along the beach face and is deposited against the Wellers Bay navigation channel jetty or transmitted into the navigation channel itself.

- Within Wellers Bay there are no new sources of sand or gravel, and sediment transport is limited to small particles such as silt circulating throughout the bay dependent on currents and waves within the bay.



Summary of Natural Hazards

- 100-year Erosion Rate (Stable Slope not included): n/a
- 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')
44.0242, -77.6290	44.0234, -77.6277	+76.03	+77.17
44.0234, -77.6277	44.0174, -77.6125	+76.03	+77.81
Within Wellers Bay		+76.03	15 m setback (typ.)

- Dynamic Beach(es):

Start (lat, long)	End (lat, long)	100-year Erosion Rate (m/year) or Stable	Dynamic Beach Name
44.0234, -77.6277	44.0175, -77.6124	Stable	Wellers Bay Barrier Beach

- Wave climate ~1 km offshore (output location W12):

ARI (years)	Depth (m)	Hs (m)	DIR (deg)	Tp (s)
5	9.8	2.88	218	10.5
10	9.8	2.93	218	10.5
25	9.8	2.97	218	10.5
50	9.8	2.99	218	10.5
100	9.8	3.01	218	10.5

Infrastructure and Ecosystem Threats

- Shoreline development and dock infrastructure is on low lying land and flood prone.
- Sedimentation in the navigation channel and ongoing maintenance.

Shoreline Management Recommendations

- Additional shoreline armoring impacts are low. However, shore protection does alter the natural shoreline habitat in Wellers Bay.
- Avoid protection of remaining natural shoreline and coastal wetlands areas. Consider greater setbacks for future development, permanent or seasonal, from hazardous lands and wetlands.
- Monitor barrier beach for stability and re-use dredged sediment from navigation channel to re-build barrier beach if required.
- Pursue habitat restoration projects to enhance local wetlands.

Use Disclaimer

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