

Reach 7 – Port Hope to Cobourg



Local Conditions

- Reach Length = approximately 10.2 km.
- The jetties in Port Hope and Cobourg Harbour are the boundaries of a large littoral sub-cell with the Ganaraska Region Conservation Authority.
- Port Hope features sand accumulation in West Beach and a very narrow beach deposit on the east side of the jetties.
- Cobourg also features a large west beach that accumulates against the harbour. The east beach has been increasing in size since the 1950's partially due to sand that is dredged from the entrance to the port and hydraulically pumped onto the beach.
- Between Port Hope and Cobourg the shoreline is largely undeveloped and features a natural shoreline and the Carr's Marsh Conservation Area.

Municipal Shore Protection, Monk Street, Cobourg

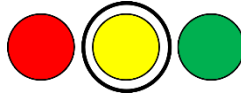


West Fillet Beach at Cobourg

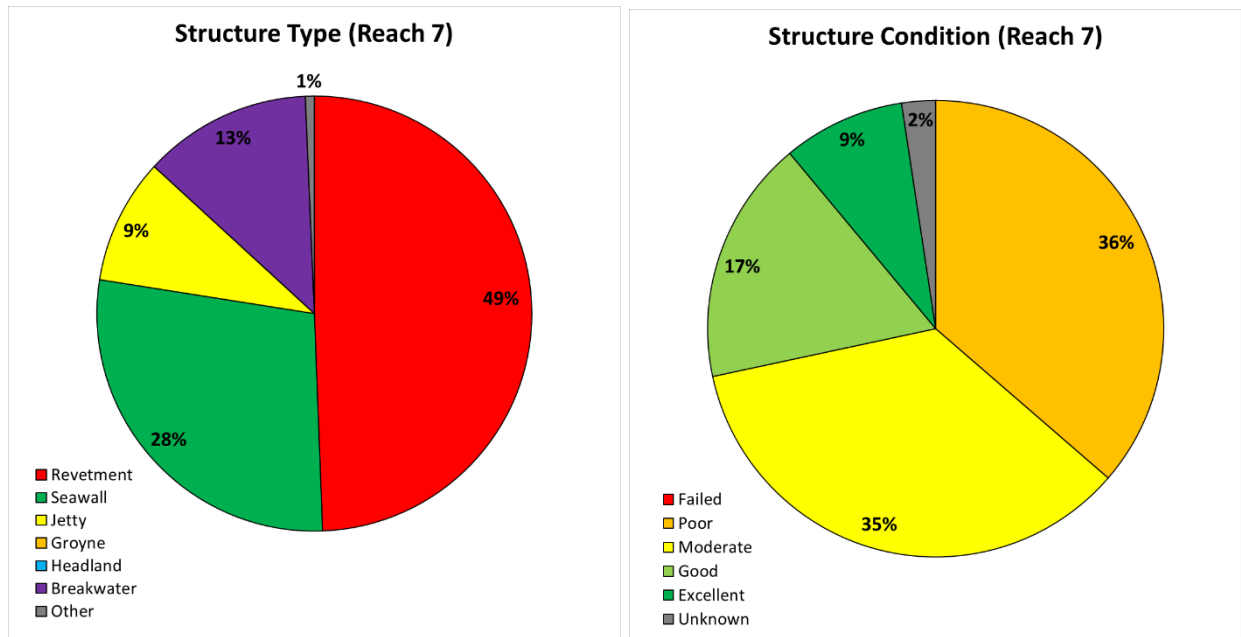


Shoreline Structures

- Reach 7 is 34% armoured, 66% natural.
- Armoured shorelines in Reach 7 are generally found in the built-up areas of Port Hope and Cobourg.
- Port Hope East Beach and the portion of shoreline fronting Lake Street features ad-hoc shore protection in the form of scrap concrete and rubble mound revetments. These structures are generally non-engineered and are in poor to moderate condition. Upgrades should be considered to mitigate erosion east of Port Hope.
- A significant portion of the shoreline west of Cobourg is armoured, with the majority being private property shore protection and some municipal shore protection (Monk Street). Private property shore protection is generally a mix of well-engineered and moderately engineered structures, most of which are in good condition. Some ad-hoc structures exist in poor condition and require upgrades to be effective.
- Municipal shore protection fronting Monk Street is significant and robust; however, it has a reasonably low crest and unprotected backshore. Upgrades to this structure including a properly engineered rip rap filter layer, crest protection and improved toe protection are recommended to improve its longevity.
- Tolerance for additional shoreline armouring (low/**medium**/high):



- Sample statistics (for armoured portion of shoreline):



Sediment Supply and Longshore Sediment Transport

- Longshore sediment transport is predominantly from west to east in Reach 7 with a net transport potential of upwards of 100,000 m³/year at several locations throughout the reach.

- The actual transport rates in Reach 7 are likely less than 20% of the potential rate due to a lack of sediment supply and an intermittent exposed bedrock lakebed.
- Sediment supply is mostly limited to local bluff erosion between Port Hope and Cobourg with a small amount of sediment naturally bypassing the jetties at Port Hope.
- Deposition occurs primarily at the Cobourg west fillet beach which features an offset of over 200 m in shoreline position from the west side of Cobourg Harbour to the east.
- Some deposition occurs at the Port Hope east beach during periods of wave action arriving from the southeast quadrant.



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
43.9464, -78.2866	43.95, -78.2732	0.5	Waterline
43.9532, -78.245	43.9521, -78.2291	0.5	Waterline
43.9512, -78.2142	43.955, -78.2018	1.2	Waterline
43.955, -78.2018	43.9541, -78.18	0.36	Waterline
43.9541, -78.18	43.9541, -78.1776	0.17	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')
43.9408, -78.2913	43.9553, -78.2008	+76.01	+77.77
43.9553, -78.2008	43.9536, -78.1687	+76.01	+77.86

- Dynamic Beach(es):

Start (lat, long)	End (lat, long)	100-year Erosion Rate (m/year) or Stable	Dynamic Beach Name
43.9439, -78.2908	43.9464, -78.2866	Stable	Port Hope East Beach
43.95, -78.2732	43.9507, -78.2692	0.5	Marsh Lookout Beach
43.9507, -78.2692	43.9509, -78.2652	0.5	Marsh Lookout Beach
43.9509, -78.2652	43.9529, -78.2577	0.5	Unknown
43.9529, -78.2577	43.9535, -78.2501	0.5	Unknown

43.9535, -78.2501	43.9532, -78.245	0.5	Unknown
43.9521, -78.2291	43.9512, -78.2142	1.2	Carr's Marsh
43.9541, -78.1776	43.9536, -78.1686	Stable	Cobourg West Beach
43.9528, -78.1679	43.9552, -78.1674	Stable	Cobourg Inner Harbour

- Wave climate ~1 km offshore (output location W7):

ARI (years)	Depth (m)	Hs (m)	DIR (deg)	Tp (s)
5	15.3	4.16	214	10.0
10	15.3	4.39	213	10.0
25	15.3	4.70	212	10.5
50	15.3	4.85	212	10.5
100	15.3	5.00	212	10.5

Infrastructure and Ecosystem Threats

- Shore protection and the parking lot at the foot of King Street (Port Hope) has deteriorated and slope is threatened.
- Private properties west of Cobourg (Pebble Beach Drive, Cedar Lea St., King Street W.) are vulnerable to flooding and erosion hazards. Lot by lot protection schemes.
- South-facing portion of west breakwater protecting Cobourg Harbour is overtopped during storms and in significant disrepair.

Shoreline Management Recommendations

- Bypass sediment from west fillet beach to nourish east fillet beach at Port Hope and at Cobourg.
- Shore protection east of Port Hope and along Lake Street should be upgraded from ad-hoc to well-engineered.
- Protect barrier beaches and wetland complexes from further development east of Port Hope and south of CN/CP rail line. This region would also benefit from sediment bypassing at Port Hope.
- Private properties west of Cobourg with ad-hoc or no shore protection require engineered erosion protection structures to reduce vulnerability to coastal hazards. Existing shore protection should be monitored and maintained as necessary.
- Monk Street revetment requires continuous monitoring and maintenance. Consider upgrades to accommodate wave overtopping such as a properly engineered rip rap filter layer and slope protection behind the structure crest. Improved toe protection should also be considered.
- Cobourg West Beach: maintain boardwalk and continue with naturalization with dune vegetation and shrubs.
- Upgrade the south-facing portion of the west breakwater and implement living shoreline restoration concepts to enhance habitat in the marina basin.

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