

Port Darlington Shoreline Damage Center Study Planning & Policy



Public Information Meeting #2 Presentation

Dec. 1, 2018

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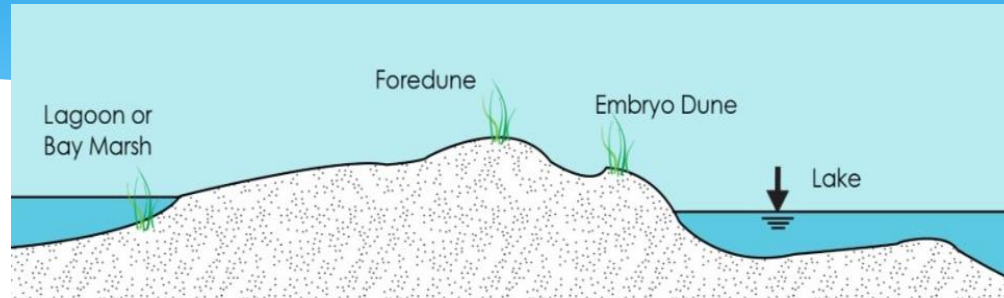
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Outline

- * Hazard Issues
 - * Flooding, Dynamic Beach, & Erosion
- * Planning and Policy Recommendations
- * Shoreline Planning Sections
 - * Additional Considerations

Multiple Hazard Issues on Barrier System



Seriousness of the Hazard Issues occurring in the Damage Center C4, have lead to the current recommendations:

Baird has presented protection works options

- * Erosion from Lake Ontario

CLOCA presented assessment of Flooding

- * Flooding/ Dynamic Beach Hazards from Lake Ontario
- * Flooding from Westside Creek & Marsh, and
- * Flooding from Bowmanville Creek & Marsh

Lake Ontario Hazards



2017 Flooding



Flood Hazard Safety Criteria (CLOCA Draft 2018)

- * Homes are inundated with water and property damage occurs, well and septic systems impacted, leading to failure of these systems and possible resident health impacts.
- * Inability to access or egress (escape) the community because flooding on roads prevents personal vehicle passage [= or > 0.3 m depth]
- * Structural damage to homes [> 0.8 m depth]
- * Threat to life from buoyancy and instability [Depth 1m and velocity >0.4 m²/s]

CLOCA has carried out their study Flooding Hazards- Lake Ontario + Creeks

Lake Ontario Water Levels

- * 2017 Water Levels from **May** to **July** broke historic highs from 1952 from **2.5 cm** to **5.6 cm**.
- * Caused extensive flooding, particularly along Cedar Crest Beach Road, where residents were at risk of flooding from both Lake Ontario and the inland marshes.
- * Additionally, strong winds occurred, putting residents further at risk of flooding

Bowmanville residents 'completely overwhelmed' by relentless flooding



Fire crews and residents spent Thursday filling sandbags and creating a blockade around dozens of waterfront houses in Bowmanville's Cedar Crest Beach community. (CTV News Toronto)



KEY CONSIDERATIONS besides Lake Ontario Hazards are the Flooding from West Side Creek, & Flooding from Bowmanville Creek



As a Result of All the Hazards- General Policy and Management Recommendations

- * VOLUNTARY ACQUISITION (based on the Hazards present)
- * No *New development* of existing lots within the Hazards (both Lake & Creek Hazards)
- * No *infilling* of existing Vacant Lots within the Hazards (both Lake & Creek Hazards)
- * No *creation of new lot* (e.g. severance for increase in development)
- * *Interior Renovations* Allowed provided there is No increase in dwelling size or change of use
- * Advise of Long term Flooding and Erosion Hazards

General Policy and Management Recommendations

Replacement of dwelling destroyed by forces of flooding and/or erosion

- * Not permitted – will need to consider acquisition in this context

*Replacement of dwelling destroyed by forces **other than** flood and erosion (e.g. fire)*

- * Relocation if possible to reduce vulnerability to hazards
- * Advise of Hazards
- * Replace with same size or smaller and utilize the maximum lot depth for Erosion setbacks and Floodproofing Standards
- * Provide the same or better ingress/egress as previous structure

General Policy and Management Recommendations

- * No *redevelopment or expansion of existing development* within the Hazards (both Lake & Creek Hazards)
 - * Maintain the existing conditions and no additional increase in size and occupancy, additions or change of building footprint or use.
 - * 'Like for Like'
 - * No basements, slab on grade (or raised for improvement to Floodproofing Conditions)
 - * If Possible: Encourage Improvement to Floodproofing (Dry Floodproofing preferable) Measures can be considered.
 - * If Possible: Encourage Increase Erosion Setback

General Policy and Management Recommendations

Accessory Structures -non-habitable, moveable structures (unattached garages, sheds, gazebos) with no utilities and maximum size of 10 m²

- * Existing accessory structures, can be repaired and maintenance permitted. If any accessory structure is within 5 m of the stable slope crest, surcharge effects on slope stability be assessed by a geotechnical engineer.

Septic Systems

- * No expansion of existing septic systems unless there is a public health issue
- * Repairs and/or maintenance to existing septic systems permitted, but no expansion to system

General Policy and Management Recommendations

Relocation of dwelling away from shoreline

- * Optional on part of owner but relocate outside of Erosion Hazard area & in accordance with the Floodproofing Standard. (Dry Floodproofing Preferred) where possible
- * Provide improvements to ingress/egress access wherever possible

Swimming pools

None inside the hazard areas (exception may be possible behind bluff on Cove road, depends on individual Erosion Setback distance)

Shoreline Protection

- * Recognize that Protection Works can address Erosion but do not address Flooding Issues from Creeks or the Extreme Water Level events from Lake Ontario.



General Policy and Management Recommendations

Protection Works

Permitted in Appropriate areas (e.g. Erosion along Cedar Crest Beach Road but not on Dynamic Beach System along West Beach Road where they are not necessary)

- * Allow new and repairs/maintenance to existing
- * CLOCA to review the Erosion Allowance and Floodproofing criteria, they will be addressed in accordance with the “Established Standards and Procedures.

Protection Works

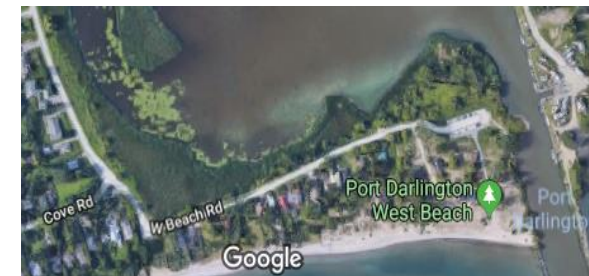
For new and/or repair/maintenance of protection works. When existing development is within the hazard zone then the Protection Works standards applied in accordance with individual site conditions.

- * If erosion of the shoreline is occurring then the appropriate Floodproofing Measures, Erosion Hazard Limit (36m Erosion set back wherever possible), PLUS the installation of the 'appropriate' protection works recommended.
- * The floodproofing Elevation is recommended for the residential structures PLUS the Erosion Allowance. If possible dry floodproofing is preferred but may not be possible in all areas.

Planning & Policy Sections

Key sections of Shoreline

- * West End: St. Mary's to Watson Crescent
- * Cedar Beach Road
- * Mouth of Westside Creek
- * Cove Road
- * West Beach Road



Western End: East Side of St. Mary's Cement to Watson Crescent – Dynamic Beach Backed by Bluff & Eroding Bluff

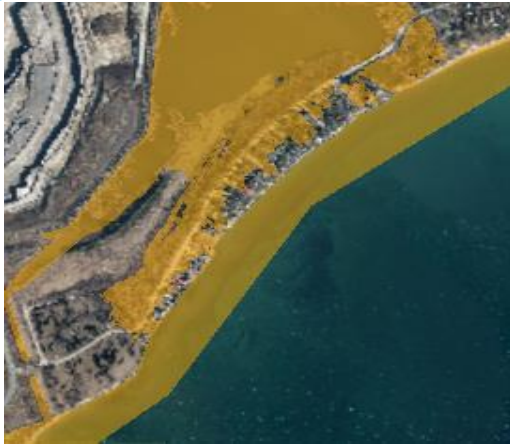


Western End: East Side of St. Mary's Cement to Watson Crescent – Dynamic Beach Backed by Bluff & Eroding Bluff



- * Area owned by St. Mary's Cement and Municipality of Clarington (in YELLOW)
- * It does not have habitable structures within Hazard

Cedar Crest Beach Road - Erosion & Flooding from Lake Ontario + Flooding from Westside Creek + Westside Creek Marsh



Lake Ontario 100 year Flooding Event



Riverine Regulatory Flood

Cedar Crest Beach Road: Flooding Hazard & Erosion Hazard

Protection Works along this section of shoreline



Cedar Crest Beach Road –Erosion and Flooding Hazards



Cedar Crest Beach Road – Existing Protection Works



Cedar Crest Beach-Protection Works

Protection Works: Ensure owners are aware that the installation of Individualized Protection Works along the shoreline will **NOT ADDRESS** the long term Erosion Hazards and they will also **NOT address the Flooding and Dynamic Beach Hazards from Lake Ontario and also from the Creek and Marsh.**

- * New proposed Protection works designed by qualified engineer and base on latest standards permitted
- * Maintenance of existing works is allowed



Mouth of West Side Creek Barrier Dynamic Beach



- * Much of area is owned by Municipality of Clarington (in YELLOW)
- * 2 private properties within Hazard

Mouth of West Side Creek Barrier Dynamic Beach- Additional Considerations



- * VOLUNTARY Public acquisition for future protection of this shoreline area

Cove Road - Dynamic Beach

- * East and West ends of Cove Road are a Dynamic Beach Hazard without Bluff

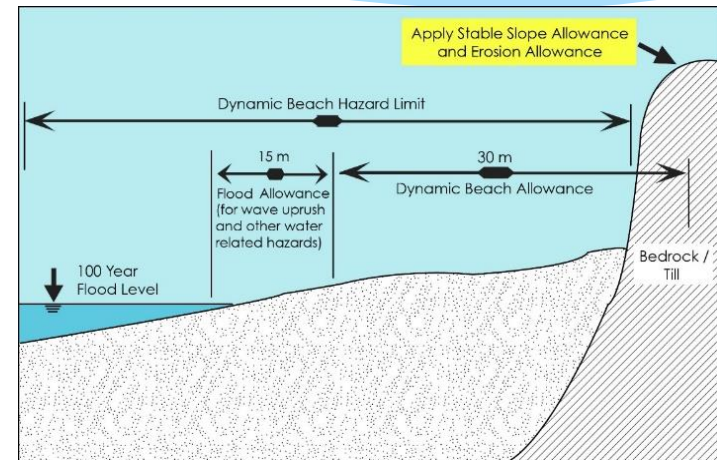


Cove Road Central Section

Dynamic Beach Backed by Bluff

Criteria:

- * Dynamic beach allowance, and
- * the erosion set back from the bluff/cliff area.
- * Erosion setback = 36 m from 1990 Sandwell Swan Wooster Report
- * The existing homes located along the middle section are **setback from the slope but many are within the Erosion Hazard Limit**



(not to scale)



Cove Road- Additional Considerations for Limited Bluff Areas

New Development, redevelopment (existing structure removed and new structure erected) or Infilling:

- * Permitted provided it is **outside of the Erosion Hazard Limit**
- * Any additions to existing structures should be placed **outside of the Erosion Hazard Limit.**

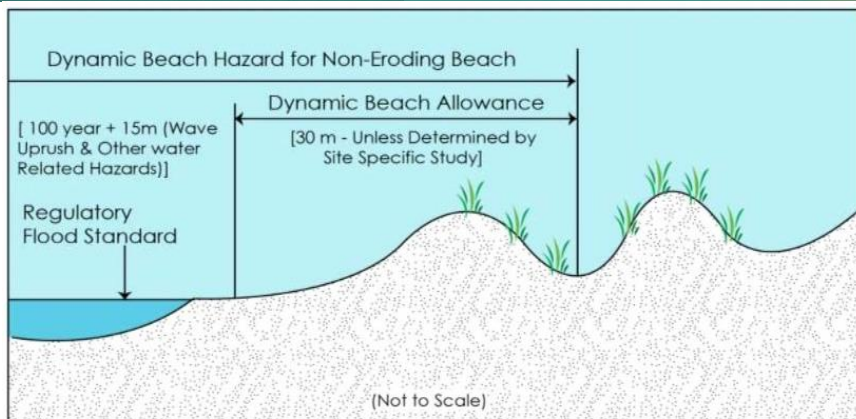
Non-habitable (i.e., garages, sheds, gazebo, decks),

- * New structures should be kept outside of the Erosion Hazard Zone to ensure the protection of the slope stability slope/bluff areas.

Cove Road- Additional Considerations for Limited Bluff Areas

- * Boardwalks, fixed walkways (not connected to dwellings) permitted if they are being used as perpendicular access to the shoreline and not at risk to slope stability or erosion hazard.
 - * It is recommend if any structure is within 5 m of the stable slope crest, that surcharge effects on slope stability be assessed by a geotechnical engineer.
- * Swimming pools permitted provided they are outside of the Erosion Hazard Limit
- * Provide required access standards

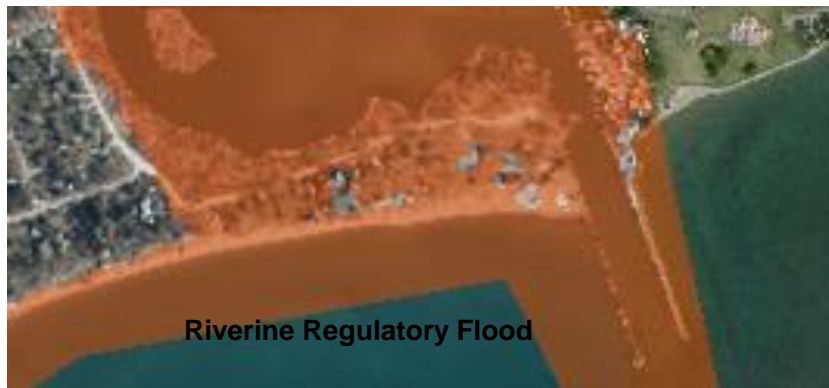
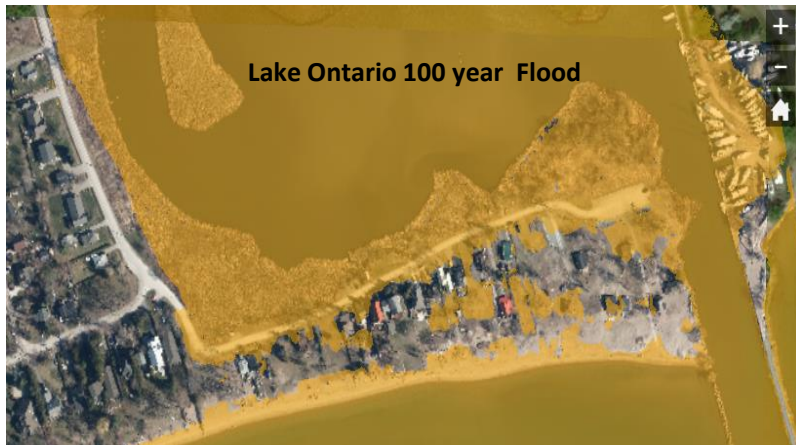
West Beach Road -Flooding from Bowmanville Marsh & Creek along Dynamic Barrier Beach System



From: Dr. Robin Davidson-Arnott, Department of Geography, University of Guelph, rdarnott@uoguelph.ca



West Beach Road – Dynamic Beach Barrier System Flooding Issues from Behind the Barrier Beach



West Beach Road– Dynamic Beach Barrier System Flooding Issues from Creek + Marsh are Main Hazards for this area



Additional Considerations for West Beach Road

- * Boardwalks, fixed walkways (not connected to dwellings) permitted if they are being used as dune cross-overs at selected points.
- * Controlled access points to the beach through the dunes on public lands will be encouraged through the use of natural walkways (e.g. roped natural beach area) and plantings
- * Protection of the natural dune area will be encouraged though the use of plantings and vegetation,
- * Protection of the natural dynamic beach system will be encouraged
- * Provide upgraded ingress/egress access standards when ever possible.

Thank You!



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