



Town of Lakeshore

Shoreline Management Plan


Project Update
October 6, 2020



Agenda

 Project Overview and Update – Where are we now?

 Climate Change and Coastal Hazards

 Results so far:

Assessment of Existing Shore Protection

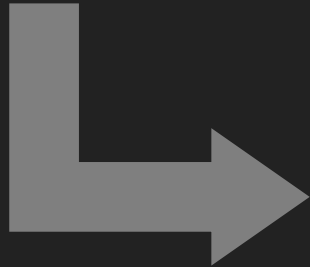
Draft Hazard Mapping

 Outcomes of the SMP – Where are we going?

 Next Steps/Consultation/Schedule

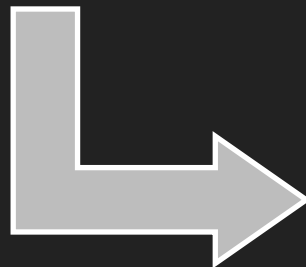
**Phase 1 –
Background
Review and
Data Collection**

- Background Review
- Drone photography
- Lake bottom depths (via boat)
- Shore Protection Database



**Phase 2 –
Technical
Analysis**

- 1:100-year Flood Level
- Dynamic Beach Assessment
- Shoreline Management Approaches/Options



**Phase 3
Shoreline
Management
Plan**

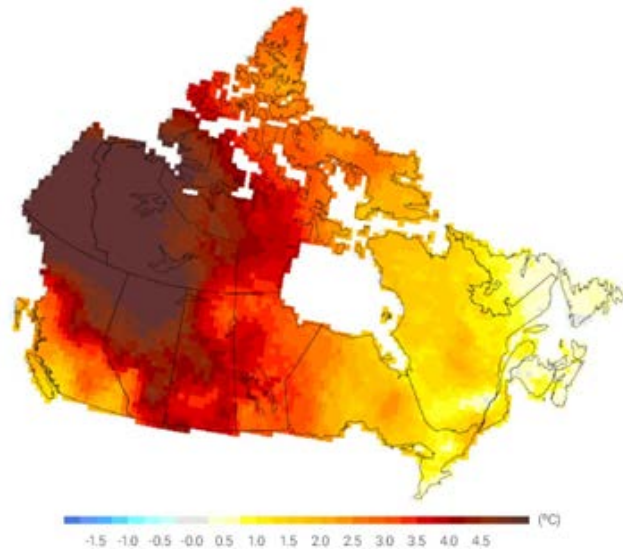
- Draft/Final Plan
- Land Use/Policy Recommendations
- Emergency Response
- Monitoring



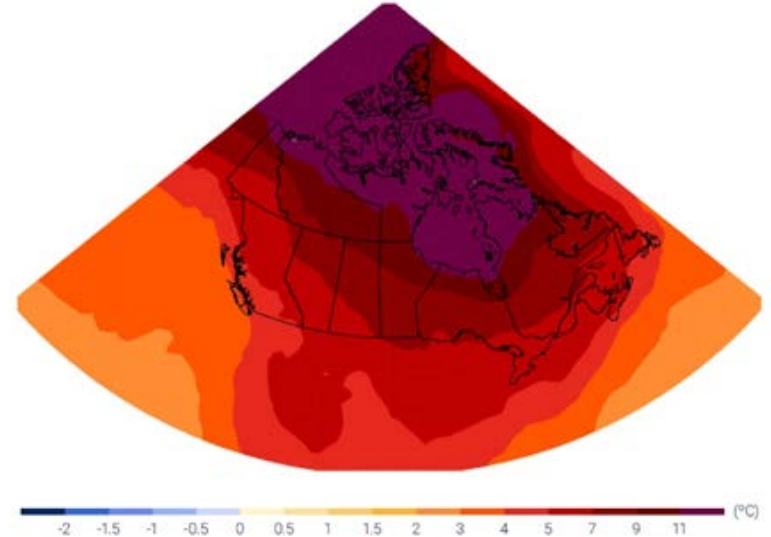
Project Work Plan

- Winter temperatures have increased and will continue to warm in the future

1948 to 2012 Winter Air Temperature Increase

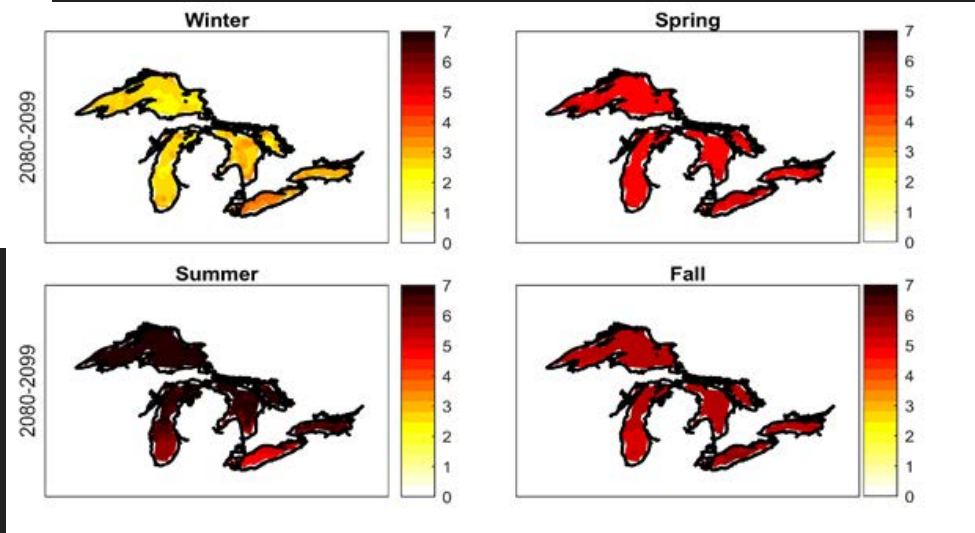
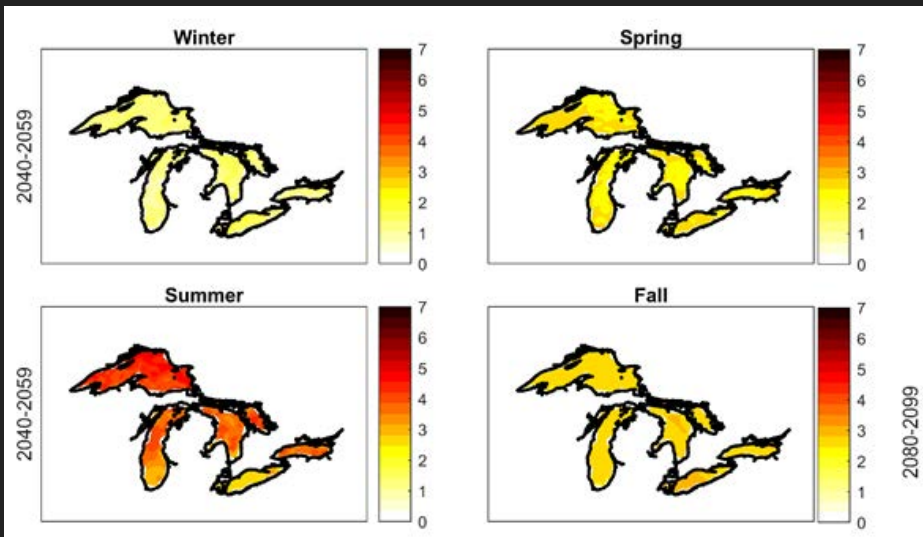


2081-2100 Winter Warming Projection for RCP8.5



Climate Change Impacts

- Projected changes in lake surface temperatures for RCP8.5 by 2050 (mid-century) and 2080 (late-century)



Climate Change Impacts

- Example of ice cover on Lake St. Clair (left: full cover, middle. Warmer winter air and water temperatures will result in less ice cover and more storm exposure in the winter

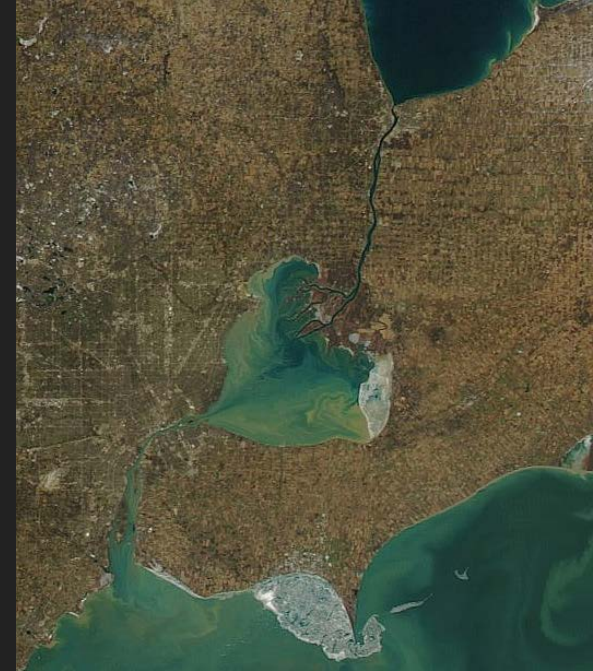
Full Ice Cover



Partial Ice Cover

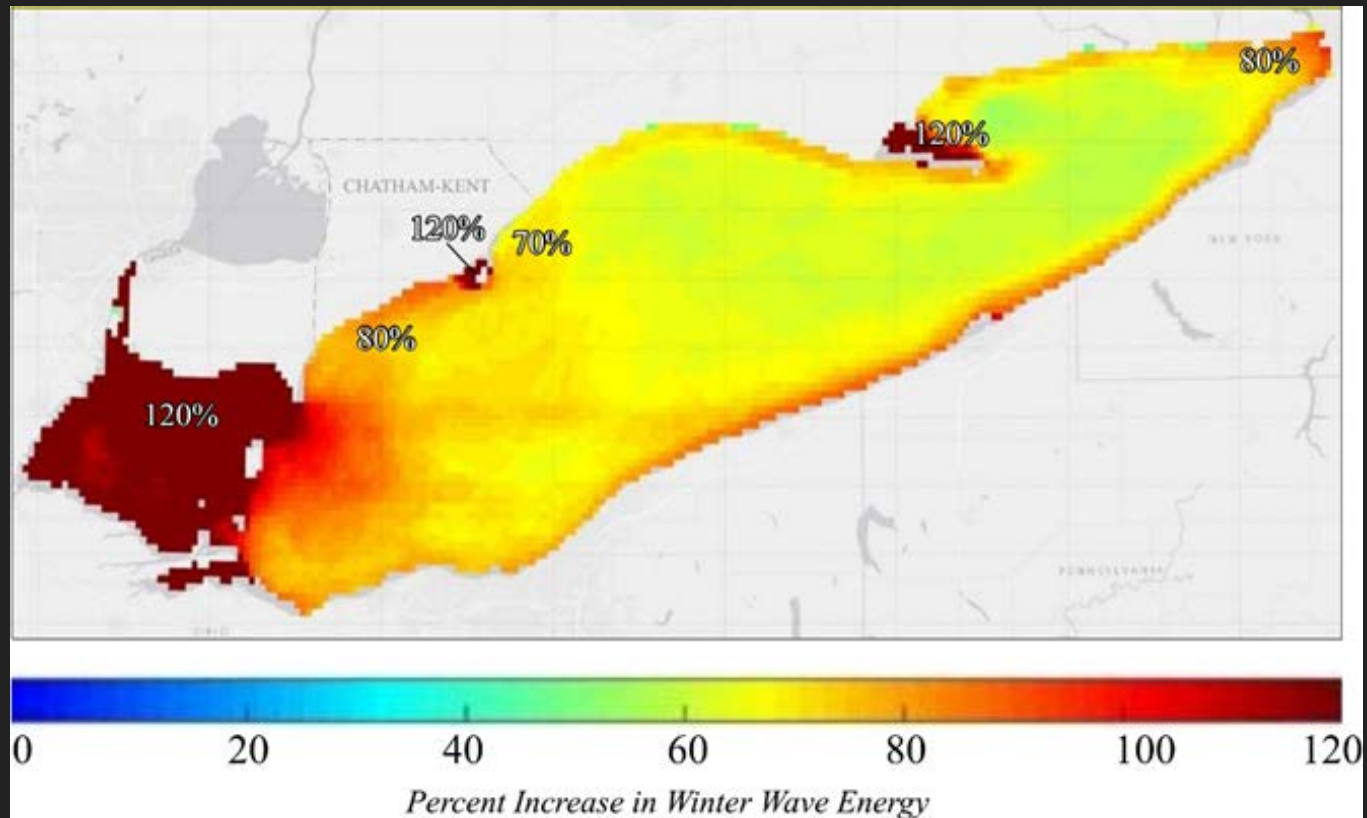


Limited Ice Cover



Climate Change Impacts

- Projected increase in winter wave energy on Lake Erie with ice-free conditions in the future (Zuzek Inc., 2019). No work on Lake St. Clair



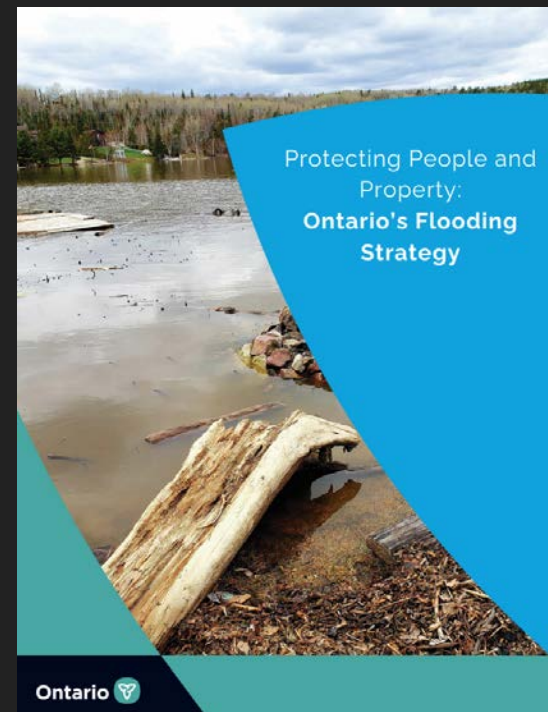
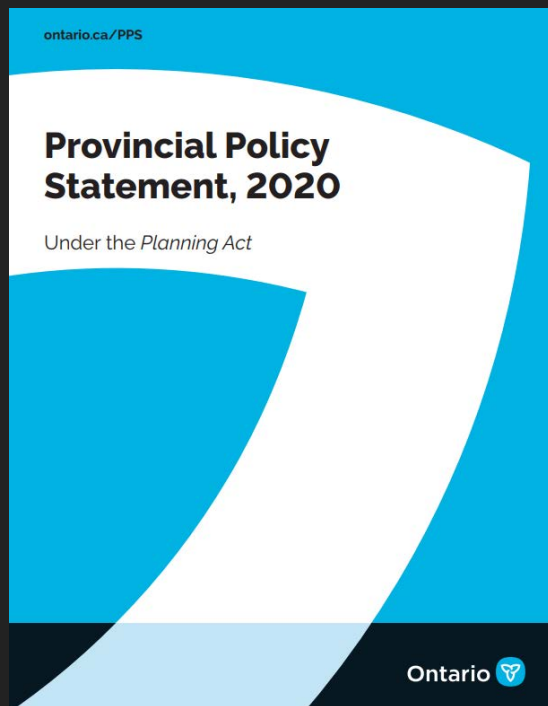
Climate Change Impacts

- Example of winter storm damage at Erie Shore Drive, Ontario and ice damage to buildings Hamburg, NY on Lake Erie



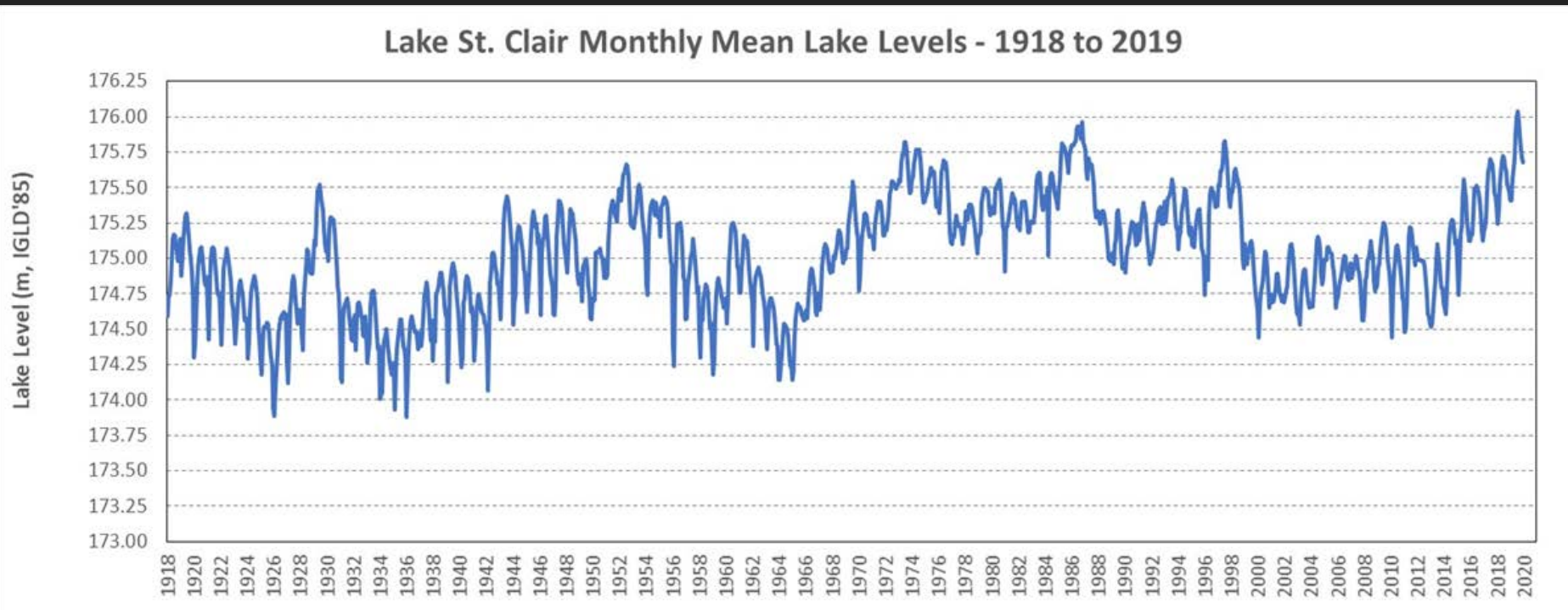
 Climate Change Impacts

- New PPS Policies – must ‘plan for the impacts of a changing climate’
- Ontario’s Flood Strategy – working on changes to legislation and technical guides to better align with current challenges



Climate Change – Policy Challenges

- Updated Lake Level Analysis
- No change in the existing 100-year lake level (varies spatially)
- Higher lake levels are expected in the future due to climate change



Climate Change – What does it mean for us?

- Accretion rates may accelerate in the future



Climate Change – What does it mean for us?

- Erosion rates may accelerate in the future



Climate Change – What does it mean for us?

TOWN OF LAKESHORE HAZARD MAPS

SHORELINE MANAGEMENT PLAN

LEGEND:

- 100-year Flood Hazard with Run-up



Notes:
1) Erosion Hazard Limit not mapped at this time.
2) Dynamic Beach Hazard Limit not mapped at this time.

INTERPRETATION OF THE HAZARD MAPS:

The hazard maps were prepared to support the Town of Lakeshore Shoreline Management Plan. The hazard limits are not the official regulatory limits of the Conservation Authority. Please contact Essex Region Conservation Authority for additional details on the regulatory limit and implications for new development.

DATA SOURCES:

2019 Orthophotography provided by the County of Essex.

2017 LiDAR Digital Terrain Model obtained from the Ministry of Natural Resources and Forestry. Contains information licensed under the Open Government Licence - Ontario.

Inset Map: © OpenStreetMap contributors

Datum:
Horizontal: UTM (17N NAD1983), metres
Vertical: IGLD85, metres

Datum Conversion:
IGLD85 - CGVD2013 = 0.47 m (average)
To convert from IGLD85 to CGVD2013, subtract 0.47 m.



PREPARED BY:



This map was published September 2020 for the Town of Lakeshore. The mapping of hazardous lands, including erosion, flooding, and landslides, is subject to change. The proposed development on or adjacent to hazardous lands should contact the Town of Lakeshore and Essex Region Conservation Authority to discuss permit requirements.

Every reasonable effort has been made to ensure the accuracy of this map. However, neither the Town of Lakeshore, Zuzek Inc., SJL Engineering, or any other affiliated party assume any liability arising from its use. This map is provided without warranty of any kind, either expressed or implied.



TOWN OF LAKESHORE



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Mapping prepared by Zuzek Inc. for the Town of Lakeshore, with support from The County of Essex.

MAP PUBLISHED SEPTEMBER 2020

Map
1 of 33

TOWN OF LAKESHORE HAZARD MAPS

SHORELINE MANAGEMENT PLAN

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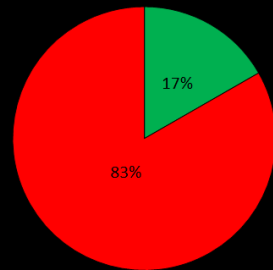
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MAP PUBLISHED SEPTEMBER 2020

Map
9 of 33

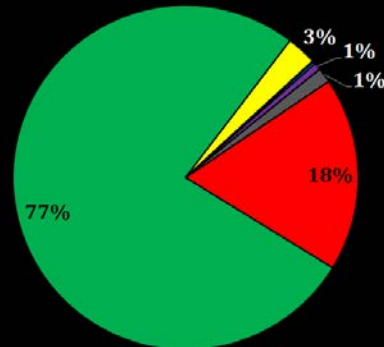
- 83% of the shoreline is armoured/protected
- Seawalls are the most common type of shore protection
- Shore protection general in good structural condition
- But crest height/elevations are low, leading to flooding. Very vulnerable to higher lake levels due to climate change lake

% Armoured vs. Natural Shoreline



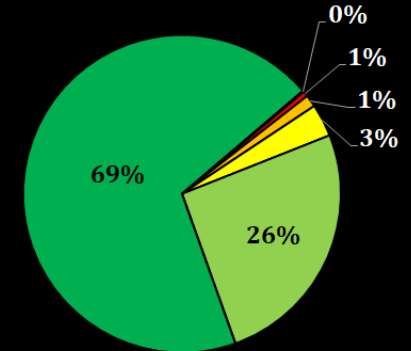
■ Natural Shoreline (%)
■ Armoured Shoreline (%)

Structure Type - Full Project



■ Revetment ■ Seawall ■ Composite ■ Jetty
■ Groyne ■ Breakwater ■ Other

Sheet Pile Seawall (Structure Condition)



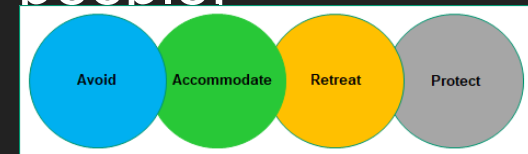
■ Failed ■ Poor ■ Moderate
■ Good ■ Excellent ■ Unknown



Existing Shoreline Protection Database

Alternative Management Approaches will be developed based on four general categories

- AVOID: reduce exposure by ensuring new development doesn't occur on hazardous land
- ACCOMMODATE: an adaptive strategy that allows for continued occupation while changes to infrastructure are made
- RETREAT: a strategic decision to withdraw or relocate public and private assets exposed to coastal hazards
- PROTECT: a reactive strategy to protect people, property, and infrastructure



Management Recommendations

ACCOMMODATE: Raise building foundation



Management Recommendations

RETREAT: Building re-location in Chatham-Kent in the 1990s, still 30 m away from bluff edge



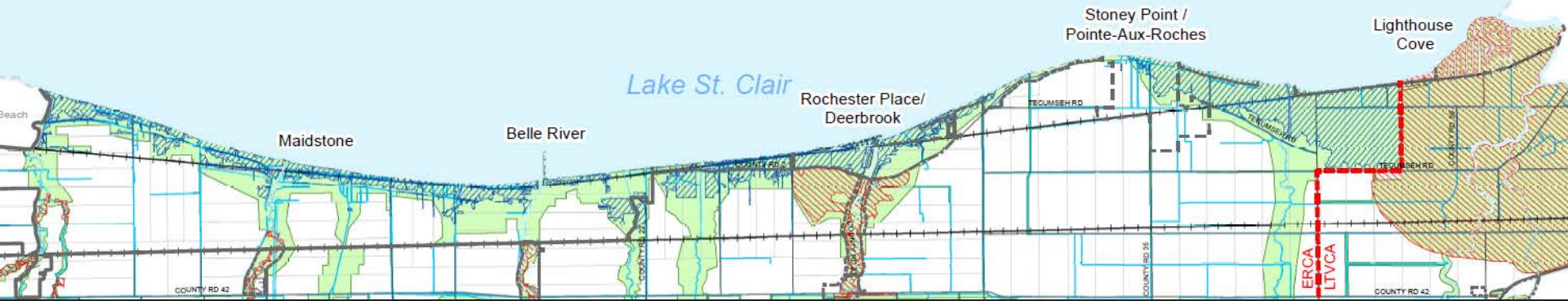
Management Recommendations

GUIDANCE FOR SHORELINE PROTECTION

- Designed by a qualified engineer
- Consider climate change impacts on crest elevation
- Avoid impacts to adjacent properties
- Integrate nature-based elements where possible
- Complete maintenance following storm events

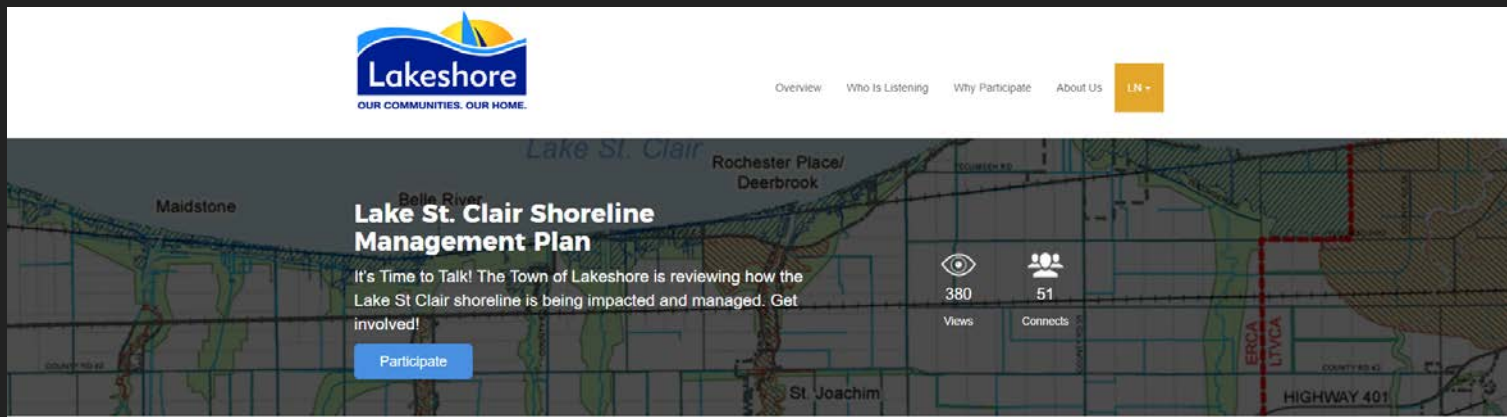


Management Recommendations



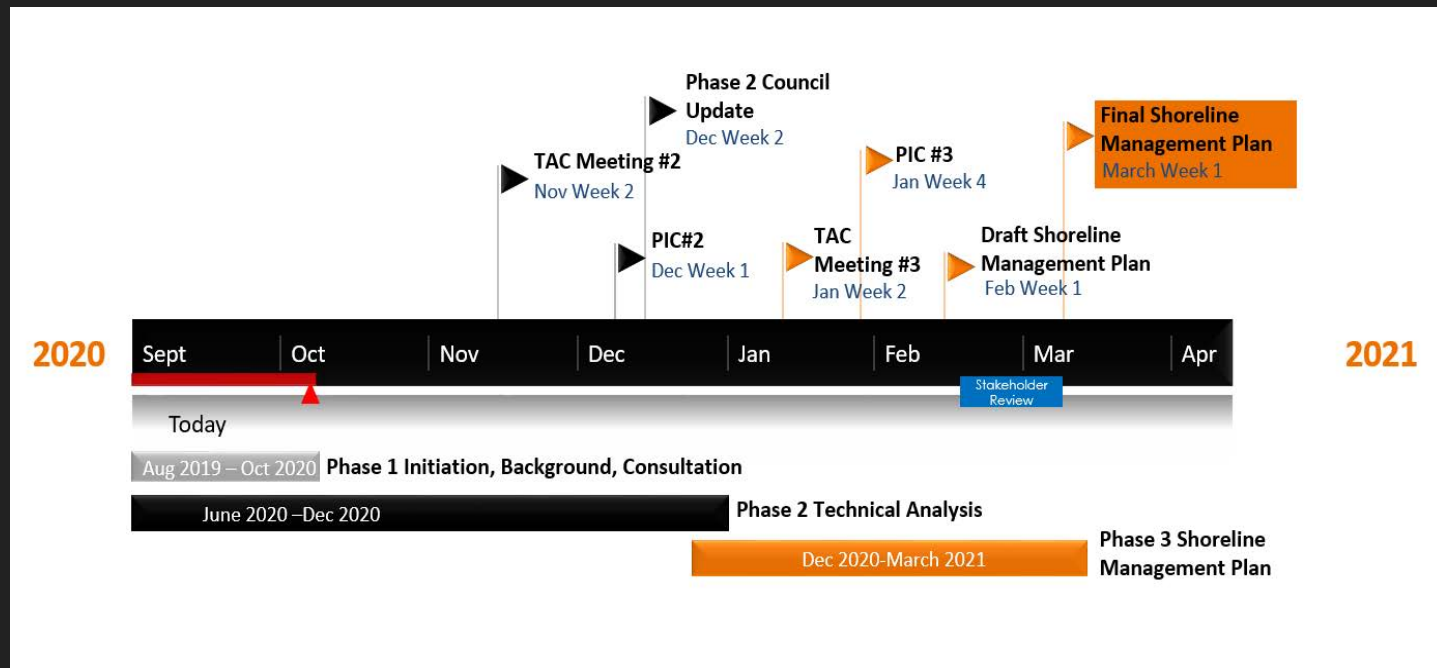
- Updated Shoreline Hazard mapping – For incorporation into OP/Zoning, and other policy/zoning updates
- Recommendations for both public and private management approaches and incentive programs – potential CIPs, Local Improvement Charges, etc.

- Technical Advisory Committee #2 - November
- (Virtual) Open House #2 and Place Speak Update – Early December
- Phase 2 Council Update - December



Phase 2 Public Engagement

- Phase 2 - Finalize analysis and Hazard Mapping and Consultation
- Phase 3 – Shoreline Management Approaches, Consultation, and Finalize Plan



Next Steps and Schedule



Questions and Discussion