Shoreline Natural Hazard Mapping Update for Essex County

Pete Zuzek, MES, CFM, P.Geo.

June 19th, 2024

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Presentation Outline

I. Mandate for Hazard Mapping

II. Integrating Climate Change

III. Examples of Shoreline Natural Hazard

IV. Public Open Houses

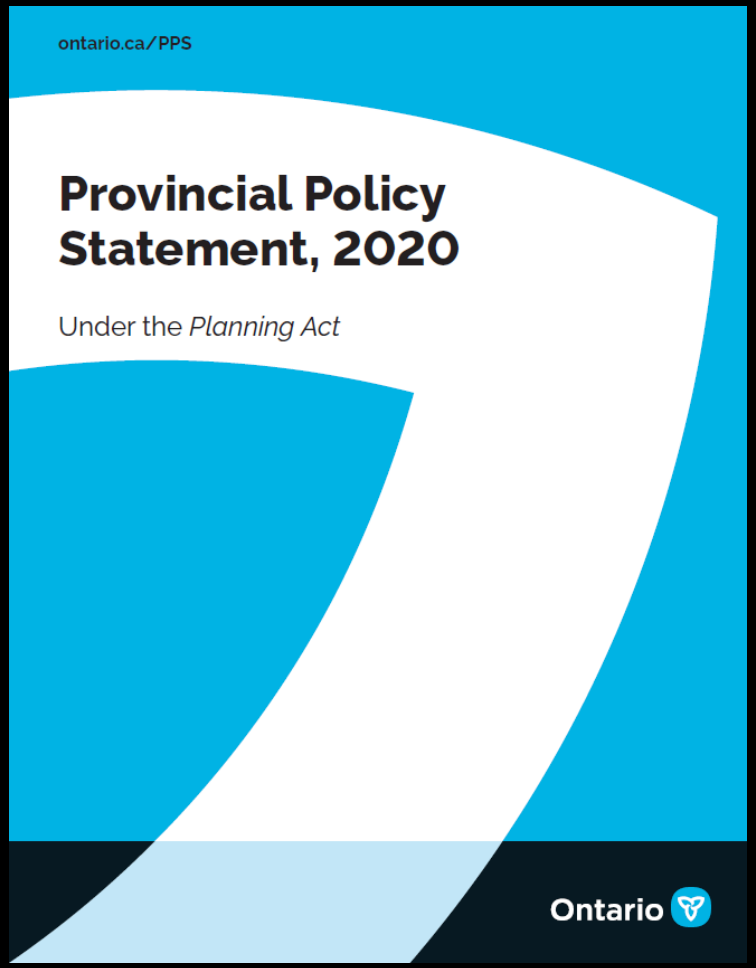
V. Next Steps

Shoreline Hazard Definitions

- Three regulated shoreline hazards for Great Lakes in Ontario:
  1. Flooding hazard
  2. Erosion hazard
  3. Dynamic beach hazard

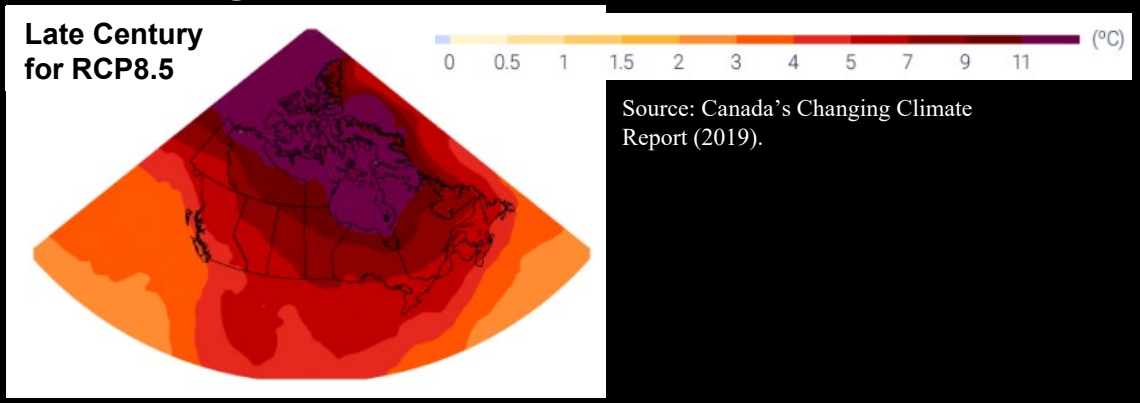
- Definitions provided in the Provincial Policy Statement (2020) and Great Lakes Technical Guide (MNR, 2001)

- NEW: “Planning authorities shall prepare for the impacts of a changing climate that may increase the risk associated with natural hazards”



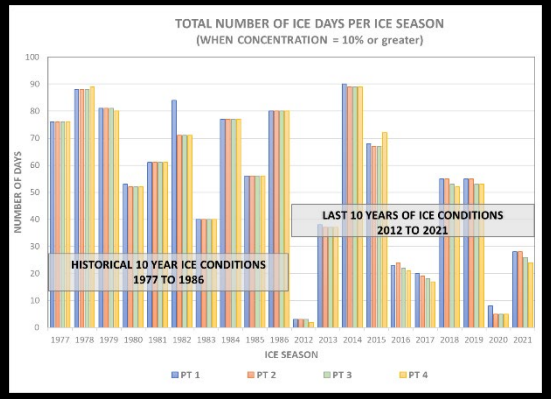
Projected Climate Change Impacts on Natural Hazards

- Warming winter temperatures

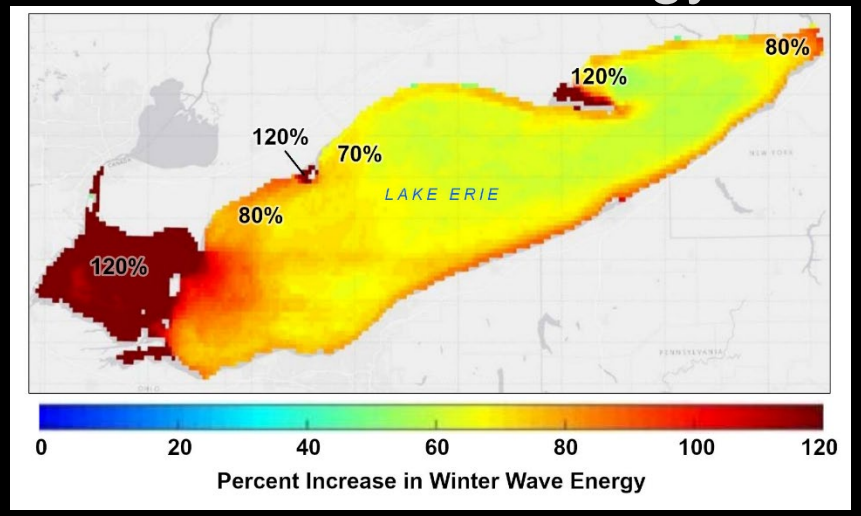


Source: Canada's Changing Climate Report (2019).

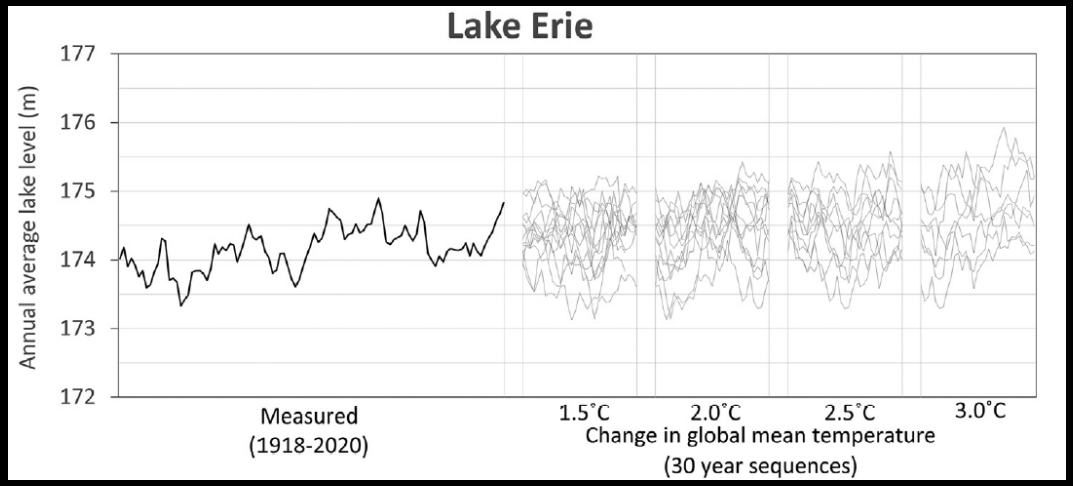
- Less ice cover



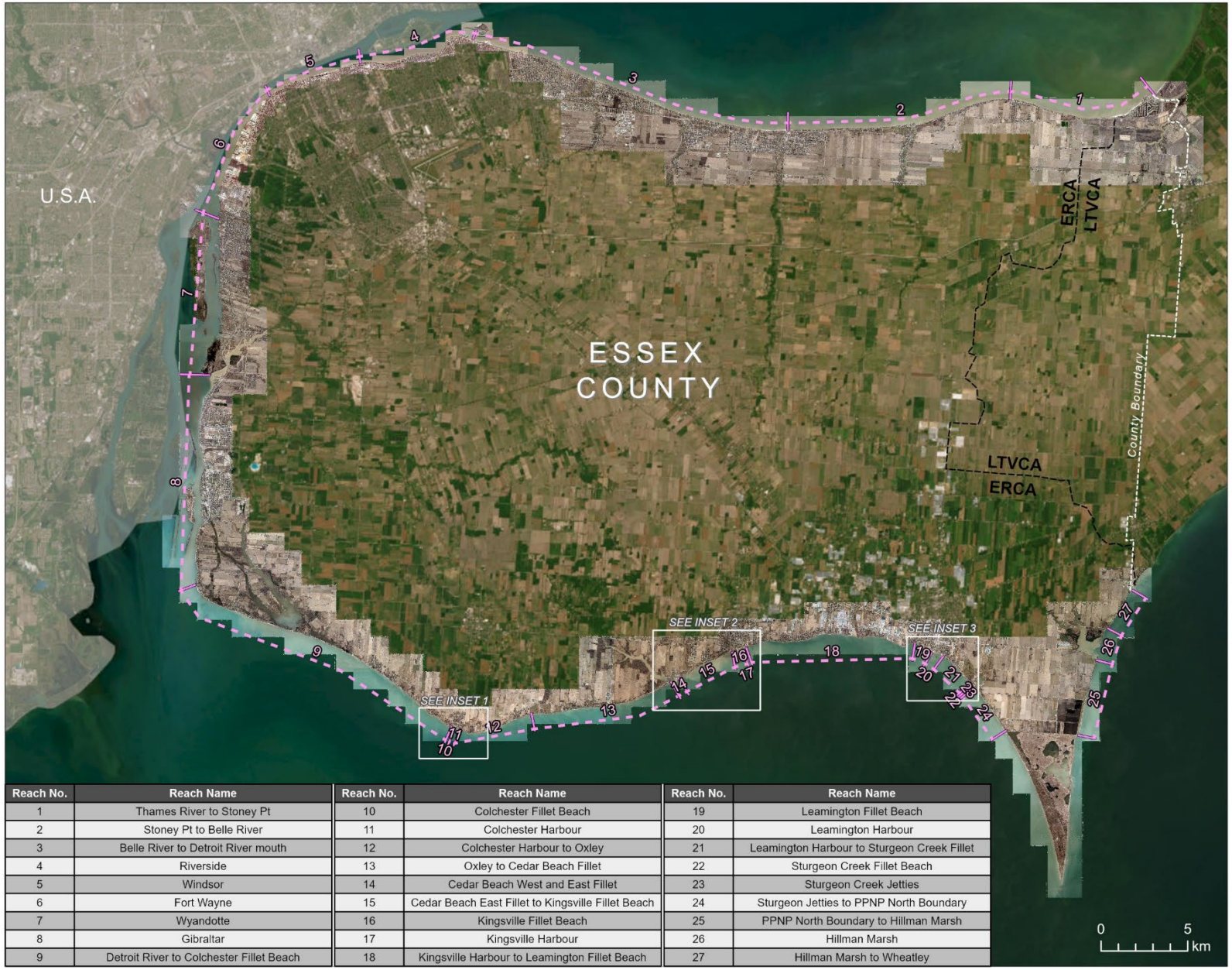
- More winter wave energy and storms

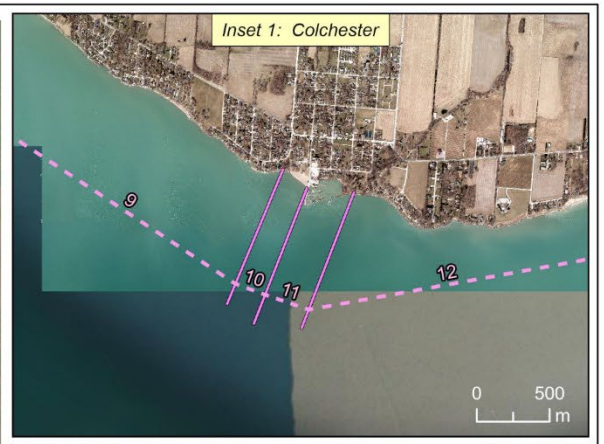


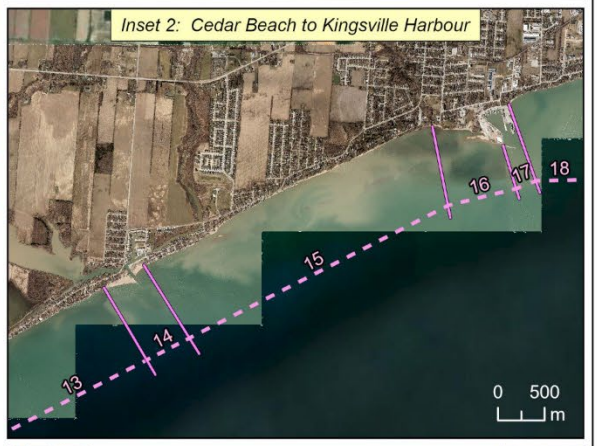
- Higher lake levels Source: Seglenieks and Temgoua (2022).

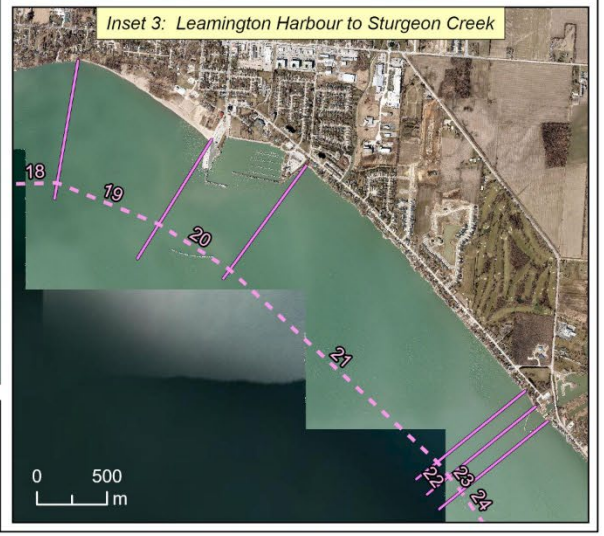


Shoreline Reaches









Reach No.	Reach Name	Reach No.	Reach Name	Reach No.	Reach Name
1	Thames River to Stoney Pt	10	Colchester Fillet Beach	19	Leamington Fillet Beach
2	Stoney Pt to Belle River	11	Colchester Harbour	20	Leamington Harbour
3	Belle River to Detroit River mouth	12	Colchester Harbour to Oxley	21	Leamington Harbour to Sturgeon Creek Fillet
4	Riverside	13	Oxley to Cedar Beach Fillet	22	Sturgeon Creek Fillet Beach
5	Windsor	14	Cedar Beach West and East Fillet	23	Sturgeon Creek Jetties
6	Fort Wayne	15	Cedar Beach East Fillet to Kingsville Fillet Beach	24	Sturgeon Jetties to PPNP North Boundary
7	Wyandotte	16	Kingsville Fillet Beach	25	PPNP North Boundary to Hillman Marsh
8	Gibraltar	17	Kingsville Harbour	26	Hillman Marsh
9	Detroit River to Colchester Fillet Beach	18	Kingsville Harbour to Leamington Fillet Beach	27	Hillman Marsh to Wheatley

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ERCA Hazard Mapping - Reaches

Study Reaches
Reach Division
Reach Extent

2021/22 aerial imagery provided by ERCA. World imagery basemap provided by Esri

Shoreline Hazard Map

County of Essex and Essex Region Conservation Authority

LEGEND:

Hazard Mapping:

- 100-year Flood Level (Historical)
- Flood Hazard Limit (Historical)
- Flood Hazard Limit (Mid-Century RCP4.5)

DEFINITIONS:

100-Year Flood Level
The 100-Year Flood Level considers both static lake level and storm surge, having a combined probability of being equaled or exceeded during any year of 1% (i.e., probability, P=0.01).

Flood Hazard Limit
The Flood Hazard Limit is defined as the 100-Year Flood Level plus an allowance for wave runup and uprush. Refer to the FHIMP Report for additional details.

Stable Slope Allowance
The Stable Slope Allowance is defined as a horizontal setback equivalent to 3 times the height of the bank or bluff. Local studies may be required by the Conservation Authority to verify site specific conditions.

Erosion Hazard Limit
The landward extent of the Erosion Hazard is the sum of the 100-year erosion rate plus the Stable Slope Allowance, measured horizontally from the toe of the bank, bluff, or shore protection.

Dynamic Beach Hazard Limit
The Dynamic Beach Hazard Limit is defined as the sum of the Flood Hazard plus 30 metres measured horizontally. The offshore limit accounts for the movement of sand in the shallow nearshore zone. Local conditions may require a modified mapping approach if the beach is eroding or a barrier beach. Refer to the FHIMP Report for additional details.

INTERPRETATION OF THE HAZARD MAPS:

The hazard maps were prepared to support the Flood Hazard Identification and Mapping Program. The hazard limits are not the official regulatory limits of the Conservation Authority. Please contact the Conservation Authority for additional details on the regulatory limit and implications for new development.

Datums:
Horizontal: UTM 17N NAD1983, metres.
Vertical: IGLD85, metres

Datum Conversion:
IGLD1985 - CGVD28 = ~0 cm (average)
IGLD85 and CGVD28 can be considered equal for the project study area.
IGLD1985 - CGVD2013 = 0.47 m (average)
To convert from IGLD85 to CGVD2013, subtract 0.47 m.

Note: There may be local variations along the reaches within Essex Region. Refer to the FHIMP Report for additional details.

N W E S

0 50 100 200 m

Scale: 1:2,000

DATA SOURCES:

2022 Orthophotography provided by ERCA (from County of Essex).

2021 Orthophotography at Windsor obtained from County of Essex Web Services.

2017 LiDAR Digital Terrain Model provided by ERCA and referenced to CGVD28:78 vertical datum..

Road network obtained from County of Essex Open Data (opendata.countyofessex.ca).

Geographical Names data obtained from Natural Resources Canada. Contains information licensed under the Open Government Licence – Canada.

Inset Map: © OpenStreetMap contributors

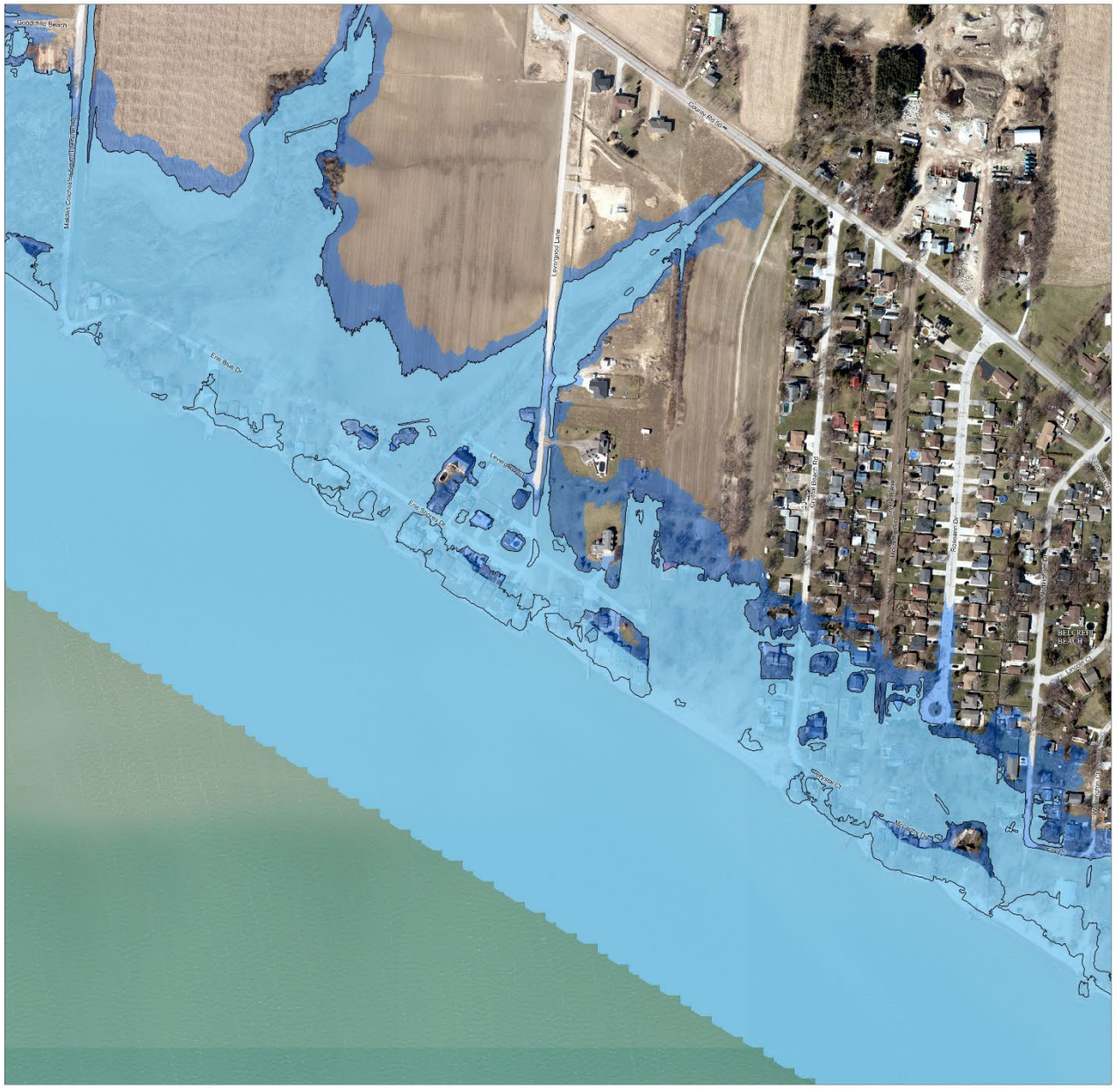
PREPARED BY:

Zuzek inc. ONE WORLD

PETER J. ZUZEK PRACTISING MEMBER 1123 PROFESSIONAL GEOSCIENTIST
February 23,2024

SJL ENGINEERING

S. J. LOGAN 100169104 PROFESSIONAL ENGINEER PROVINCE OF ONTARIO



This map was prepared by Zuzek Inc. and SJL Engineering Inc. and was published February 2024. The mapping of hazardous lands, including erosion, flooding, and dynamic beach areas, is subject to change. The proponent of a proposed development on or adjacent to the hazardous lands should contact Essex Region Conservation Authority to discuss permit requirements.

County of Essex

Essex Region Conservation Authority

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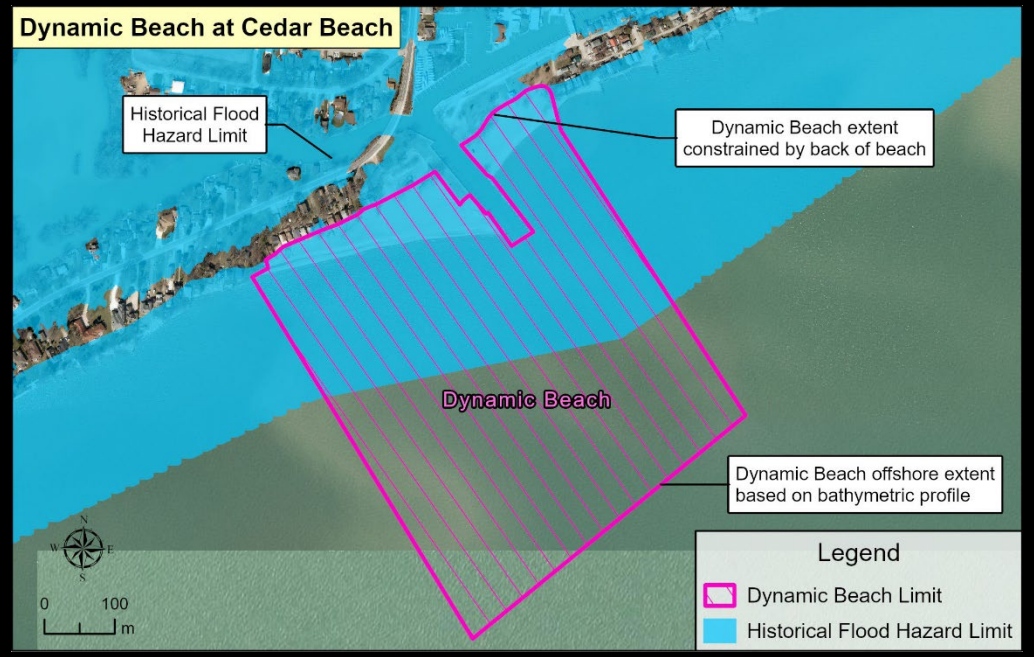
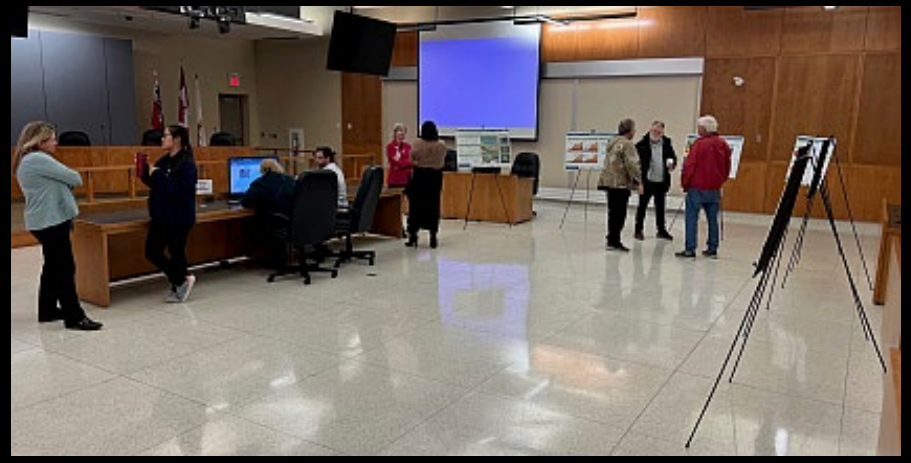
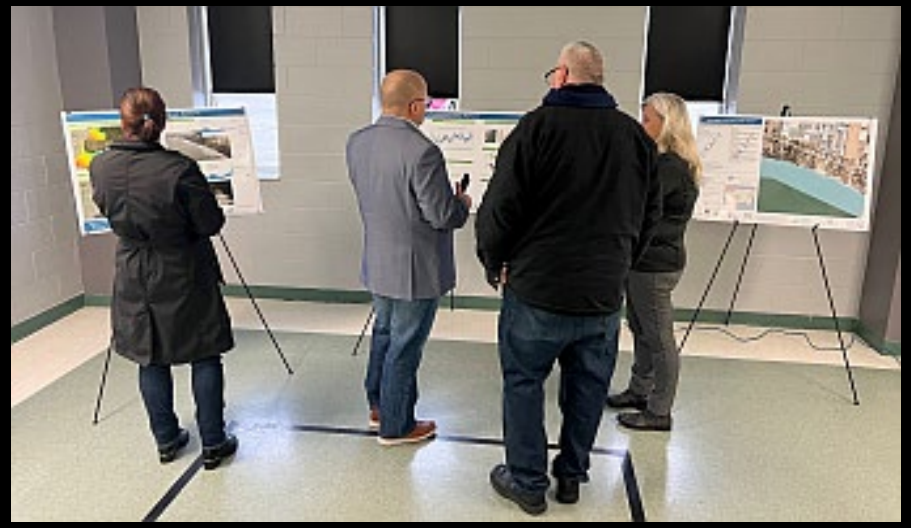
Erosion and Dynamic Beach Hazard Mapping



Public Open Houses

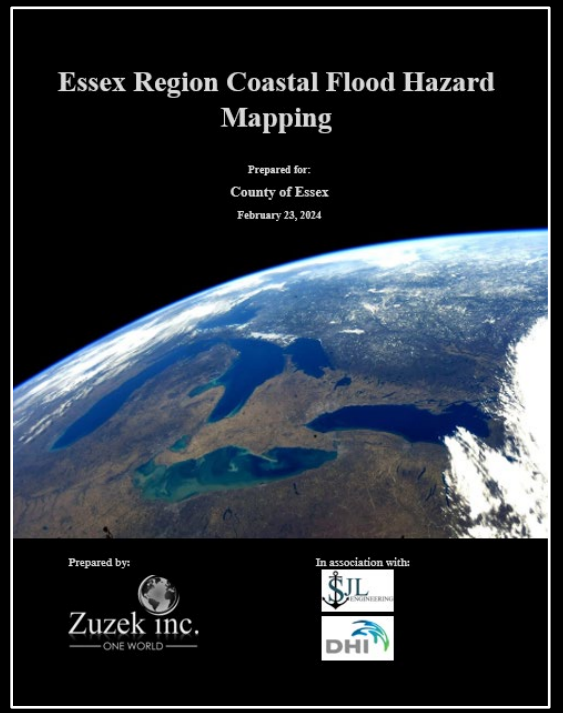
- Belle River, Harrow, Leamington, Essex, LaSalle

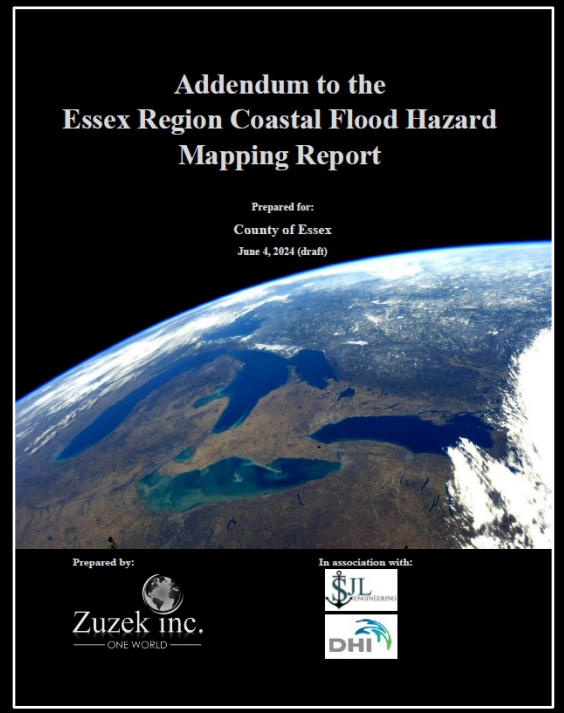




Next Steps

- Presentation to ERCA Board on June 20th, 2024
- Utilize the hazard mapping and reports for planning
- Evaluate applications for lot by lot development
- Integrate mapping into the coastal vulnerability and risk assessment for the resilience study (south shore)





Questions