

SHORELINE EROSION AND FLOOD RISK IN THE COVEHEAD / BRACKLEY BAY AREA



Friends of Covehead
and Brackley Bay
August 8, 2013

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PEI Department of Environment, Labour and Justice

SHORELINE EROSION AND FLOOD RISK IN THE COVEHEAD / BRACKLEY BAY AREA

Overview

□ Climate change

- ▣ What is it
- ▣ Climate change projections

→ Intergovernmental Panel on Climate Change (IPCC)
AR5 **Sneak Peak!**

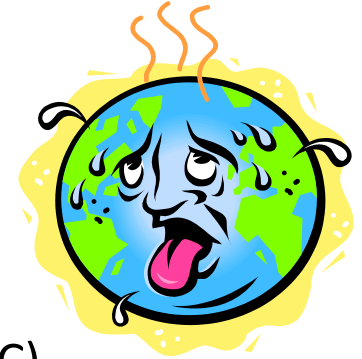
- ▣ Future impacts

□ Erosion Risk

□ Flood Risk

- ▣ Sea level rise and storm surge
- ▣ Saltmarsh migration

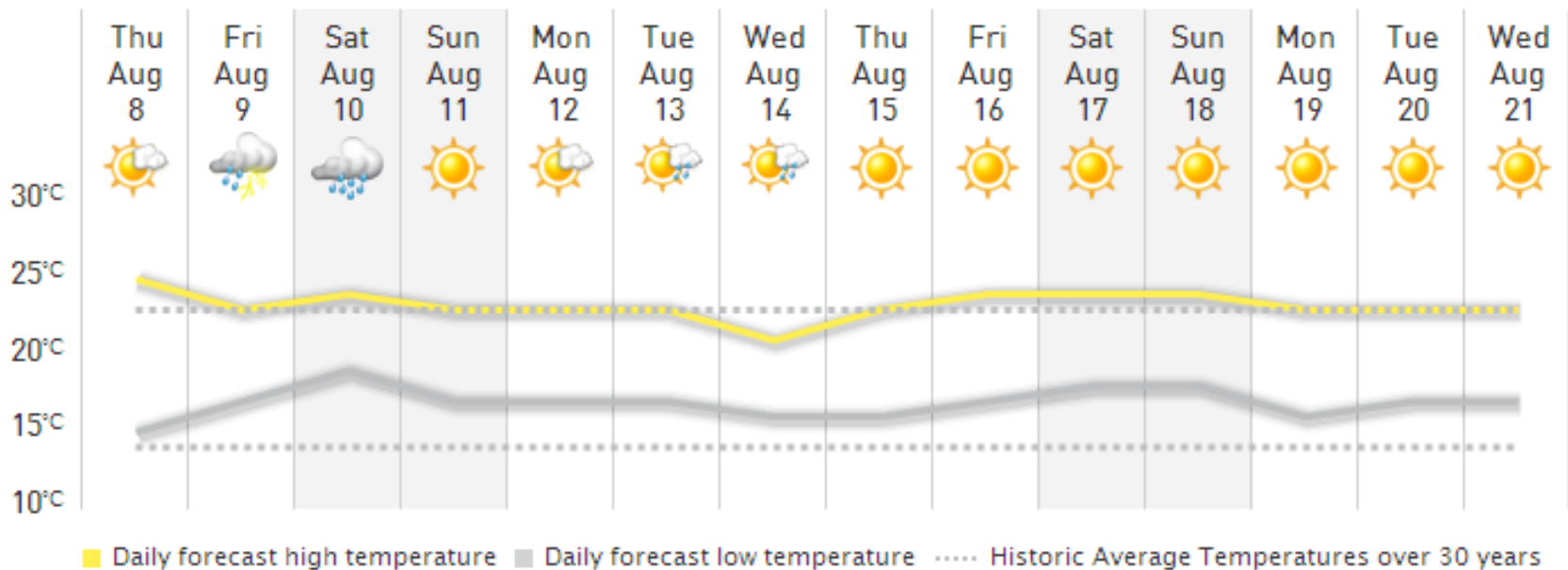
□ What next?



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Climate change: what is it?

a change in the **AVERAGE** weather conditions



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Climate change projections

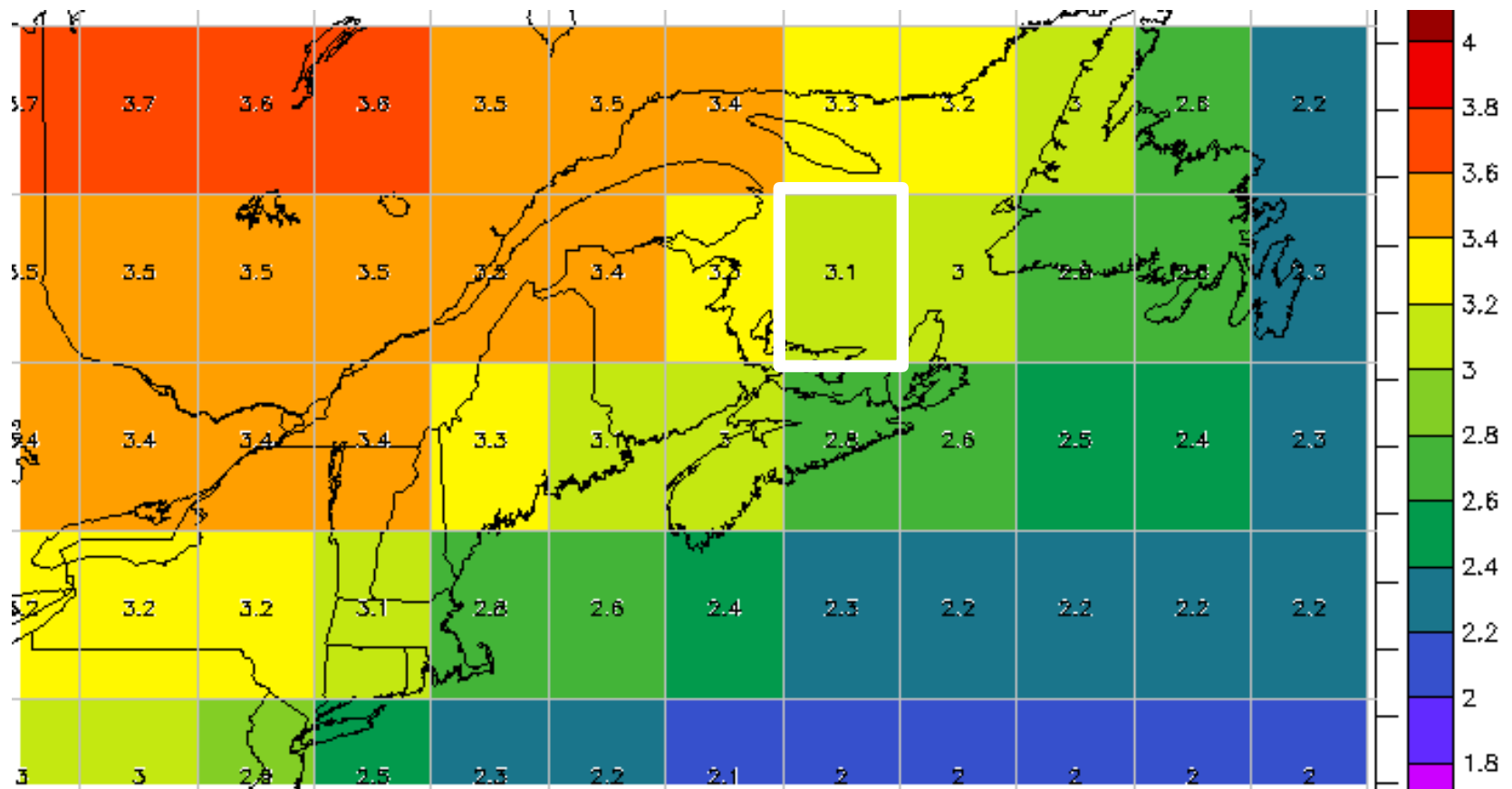
- Intergovernmental Panel on Climate Change (IPCC)
 - *the* international authority on climate change
 - 1990 – 1st report (FAR)
 - 1995 – 2nd report (SAR)
 - 2001 – 3rd report (TAR)
 - 2007 – 4th report (AR4)
 - 2014 – 5th report (AR5)



Spoiler alert! it's still getting warmer...

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Temperature change by the 2050s



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Temperature change: future impacts

- More frost free days
- Longer, warmer summers
 - ▣ Longer growing season → more nitrates
 - ▣ More sea lettuce → more anoxia
- Warmer water
 - ▣ Invasive species?
 - ▣ Acidification?



Covehead Bay, July 2012

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Precipitation change: future impacts

- More winter precipitation fall as rain (not snow)
- More heavy rainfall events
 - ▣ Increased soil erosion
 - ▣ Increased potential for pesticide runoff



West Royalty, 2008



West River, 2002

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Sea level rise: future impacts



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Sea level rise: future impacts

- More shoreline erosion



Victoria-by-the-Sea

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Sea level rise: future impacts

- More shoreline erosion
- More coastal flooding



Rusticville

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Sea level rise: future impacts

- More shoreline erosion
- More coastal flooding



North Rustico

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Sea level rise: future impacts

- More shoreline erosion
- More coastal flooding
- Saltmarsh migration / expansion



Hillsborough River

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Sea level rise: future impacts

- ❑ More shoreline erosion
- ❑ More coastal flooding
- ❑ Saltmarsh migration / expansion
- ❑ Increased flushing in estuaries?

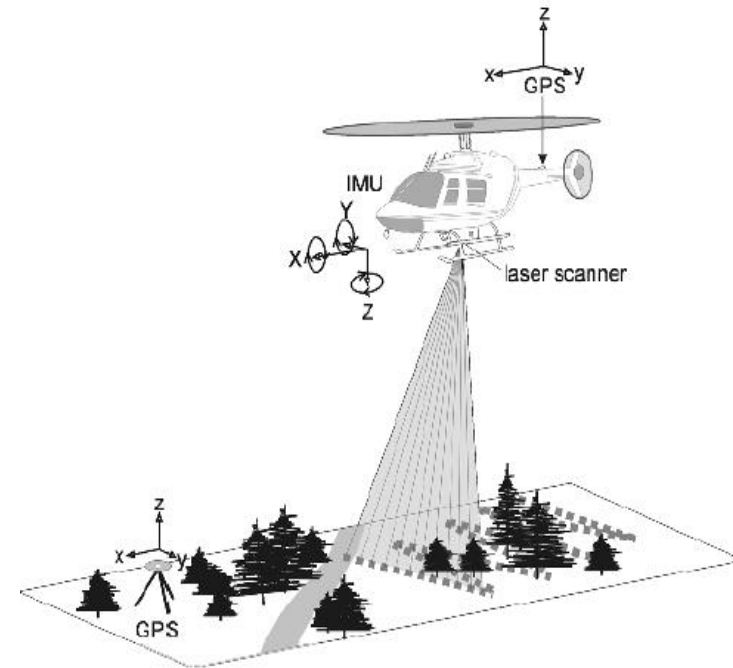


Covehead

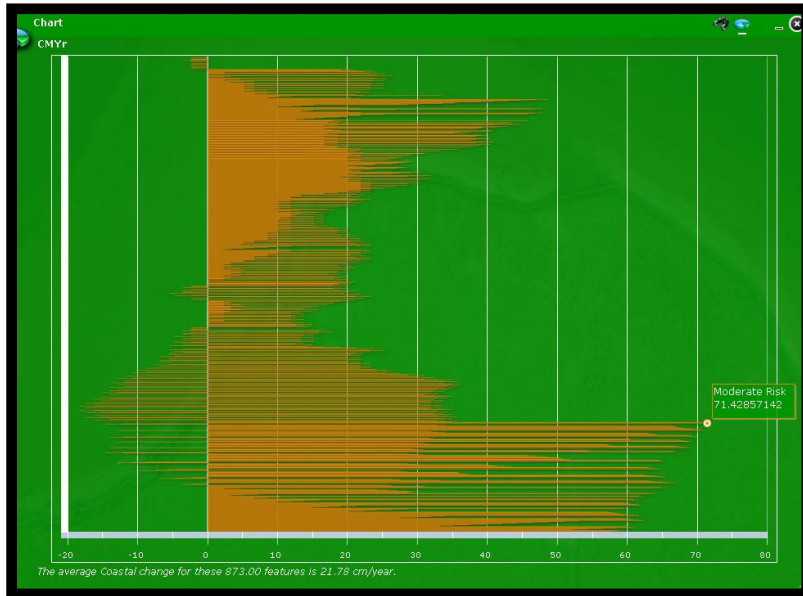
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New Data

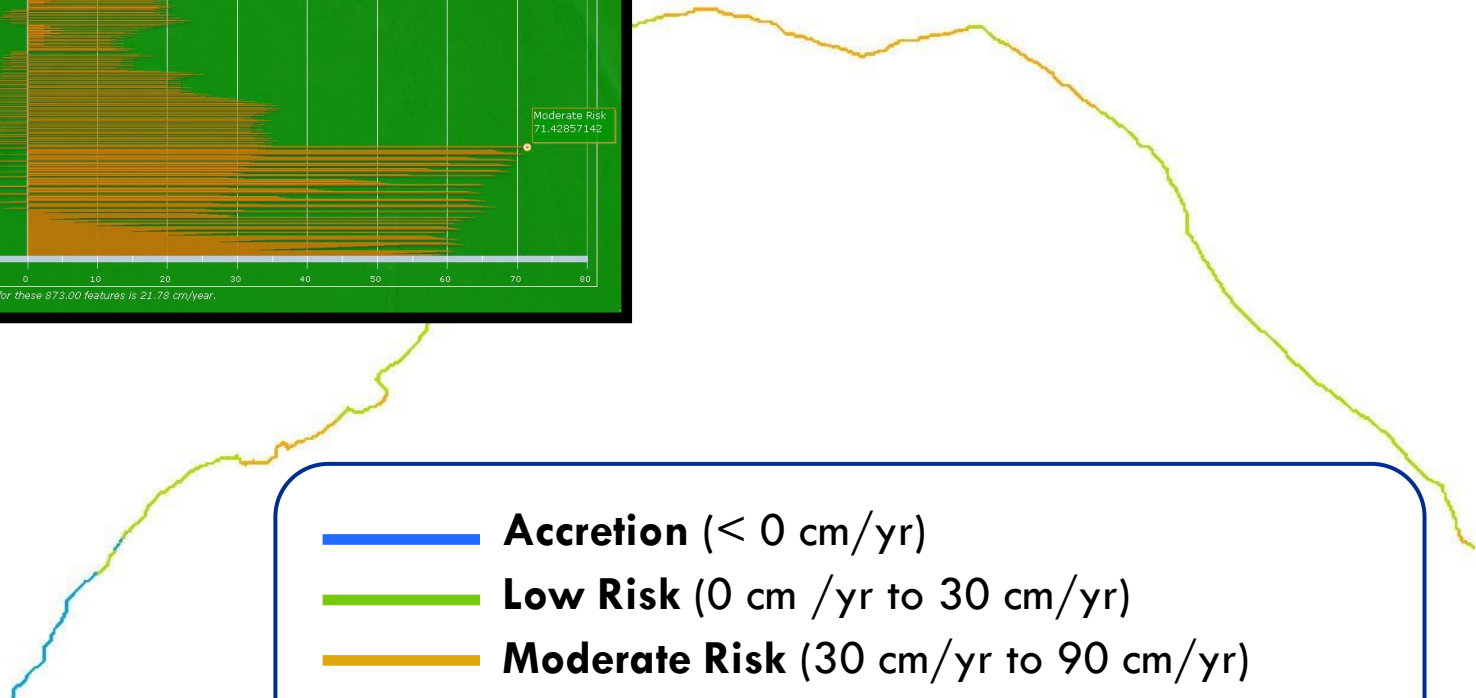
- Light Detection and Ranging (LiDAR) technology
 - ▣ Highly accurate (+/- 30cm)
 - ▣ PEI is the only province in Canada with complete LiDAR coverage
- New aerial photography (2010)
- NRCan's Regional Adaptation Collaborative (RAC) (2009-2012)
 - ▣ **NEW!** production of detailed orthophotos (1968, 2010)
 - ▣ **NEW!** updated erosion rates based 1968 and 2010 coastlines



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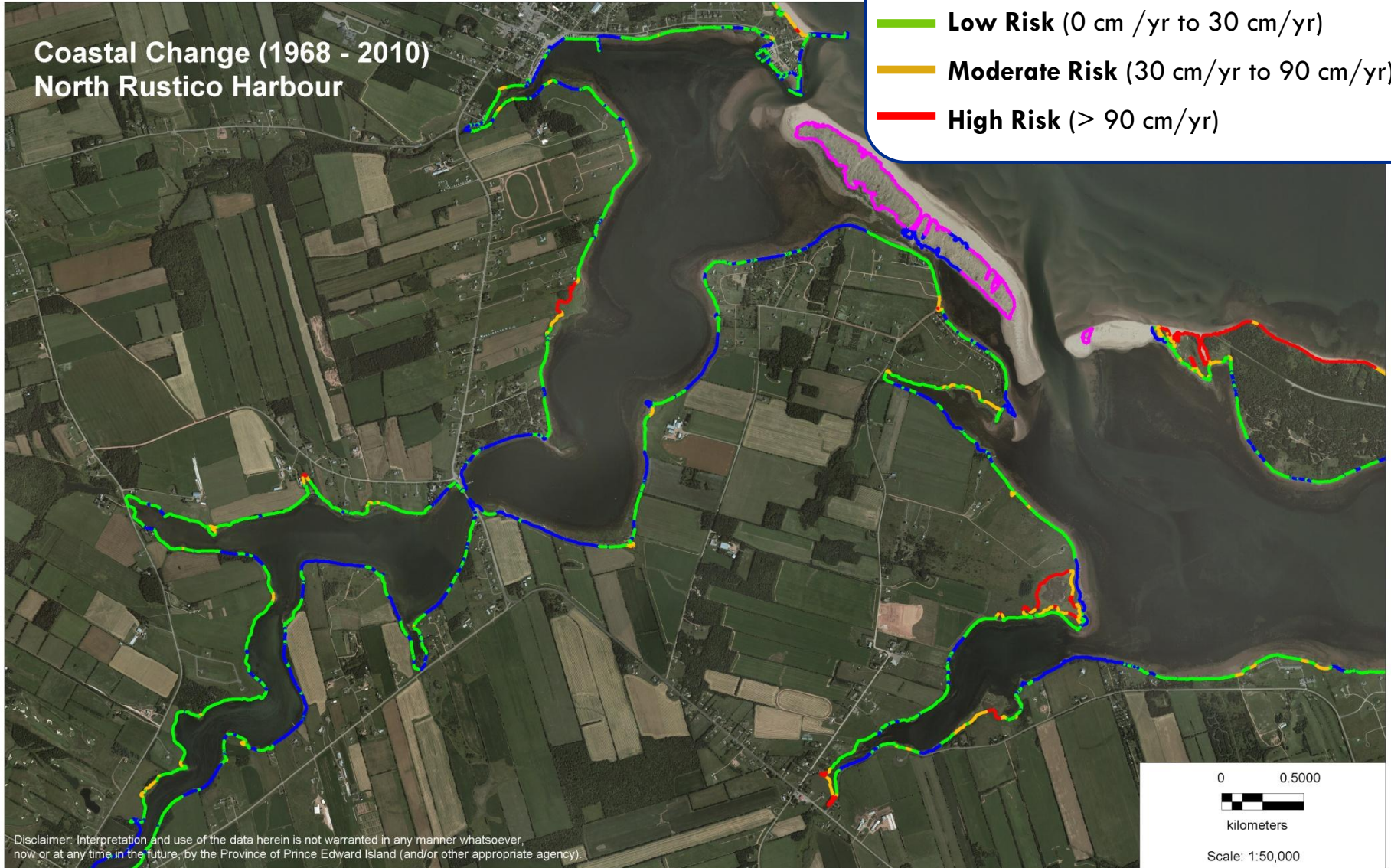
Coastal Change 1968-2010



Coastal erosion: 1968-2010

Coastal Change (1968 - 2010)
North Rustico Harbour

- **Accretion** (< 0 cm/yr)
- **Low Risk** (0 cm /yr to 30 cm/yr)
- **Moderate Risk** (30 cm/yr to 90 cm/yr)
- **High Risk** (> 90 cm/yr)



Coastal erosion: 1968-2010

Coastal Change (1968 - 2010)
Rustico Bay / Brackley Bay

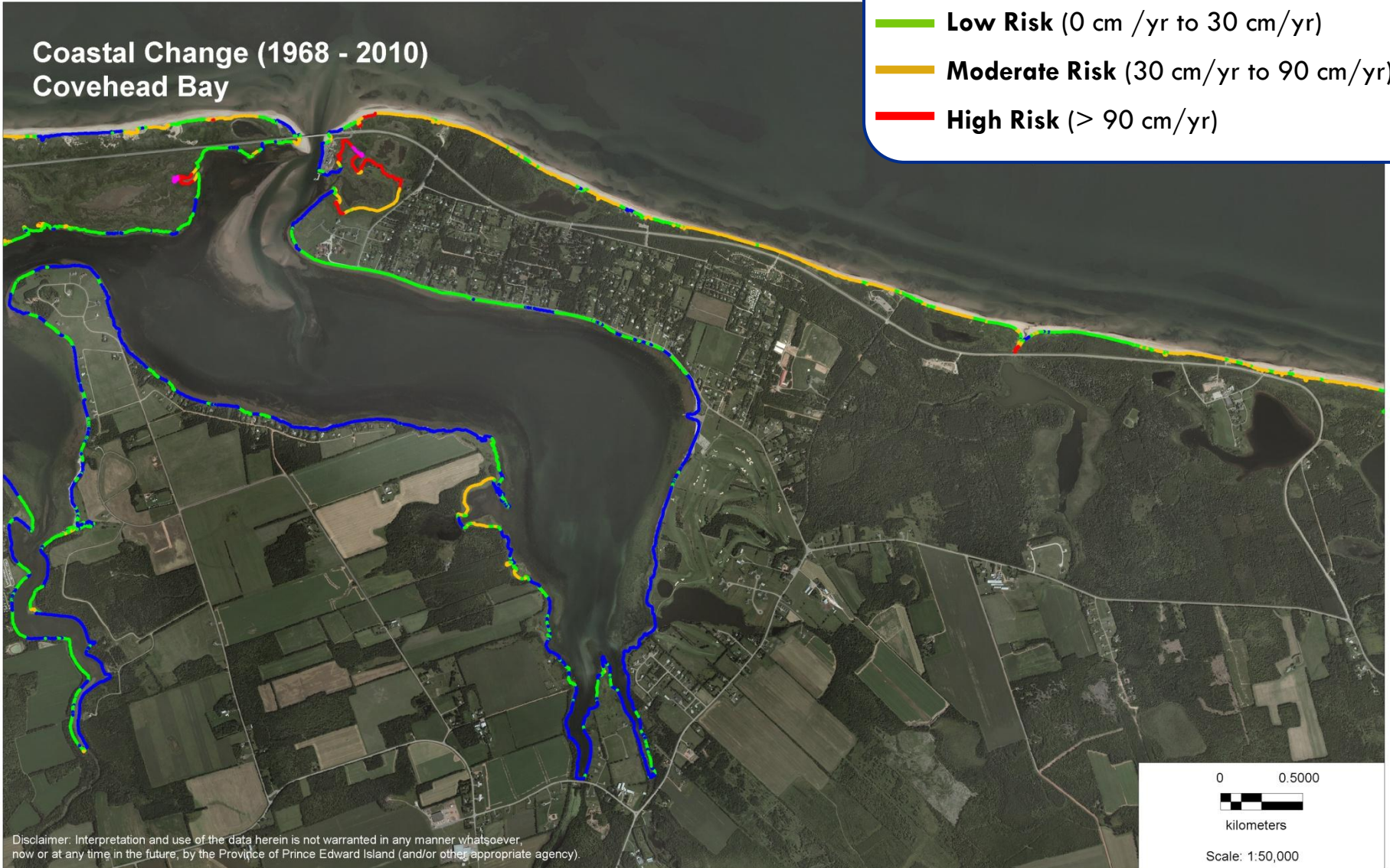
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Coastal erosion: 1968-2010

Coastal Change (1968 - 2010)
Covehead Bay

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Disclaimer: Interpretation and use of the data herein is not warranted in any manner whatsoever, now or at any time in the future, by the Province of Prince Edward Island (and/or other appropriate agency).

SHORELINE EROSION AND FLOOD RISK

IN THE COVEHEAD / BRACKLEY BAY AREA

Erosion risk vs development

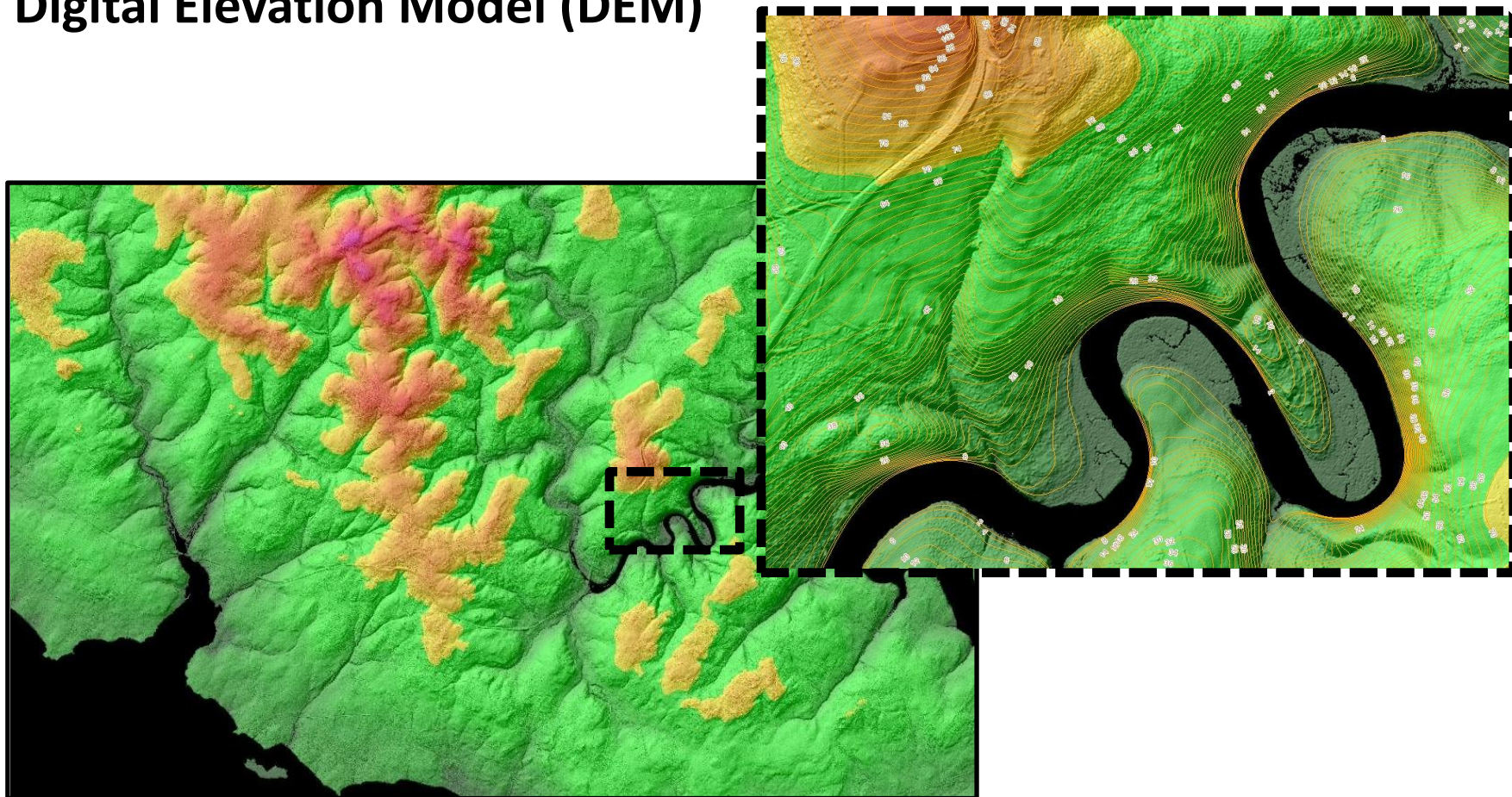
Subdivision/development along the shoreline must provide a (horizontal) setback of:

60 feet or 60 x the annual erosion rate

(Planning Act, Subdivision and Development Regulations, P-8, 16.(1))

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Digital Elevation Model (DEM)



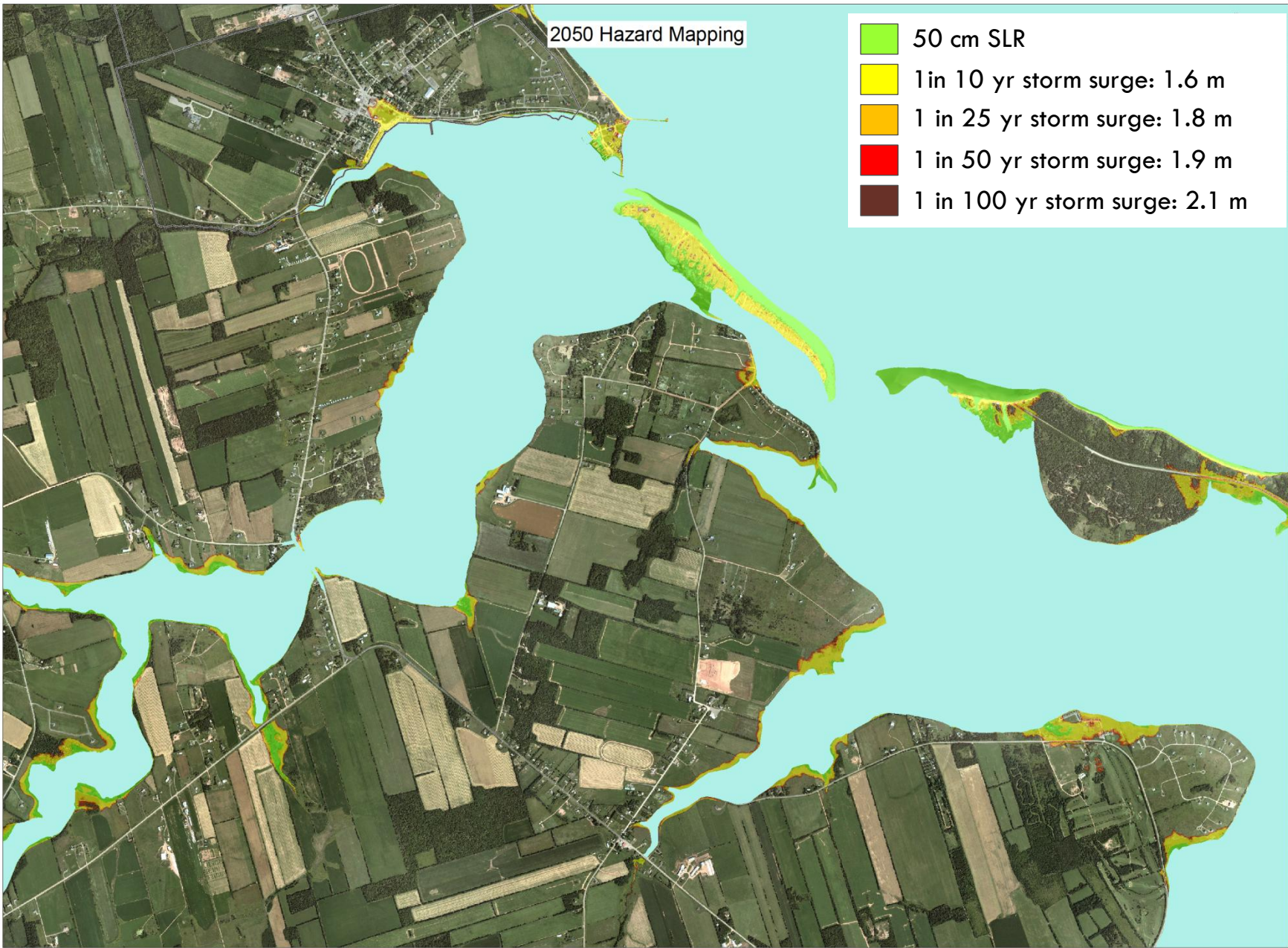
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Sea Level Rise (SLR) / storm surge projections

- SLR projections for 2050, 2100
- Surge projections
 - ▣ 1-in-10 year storm
 - ▣ 1-in-25 year storm
 - ▣ 1-in-50 year storm
 - ▣ 1-in-100 year storm

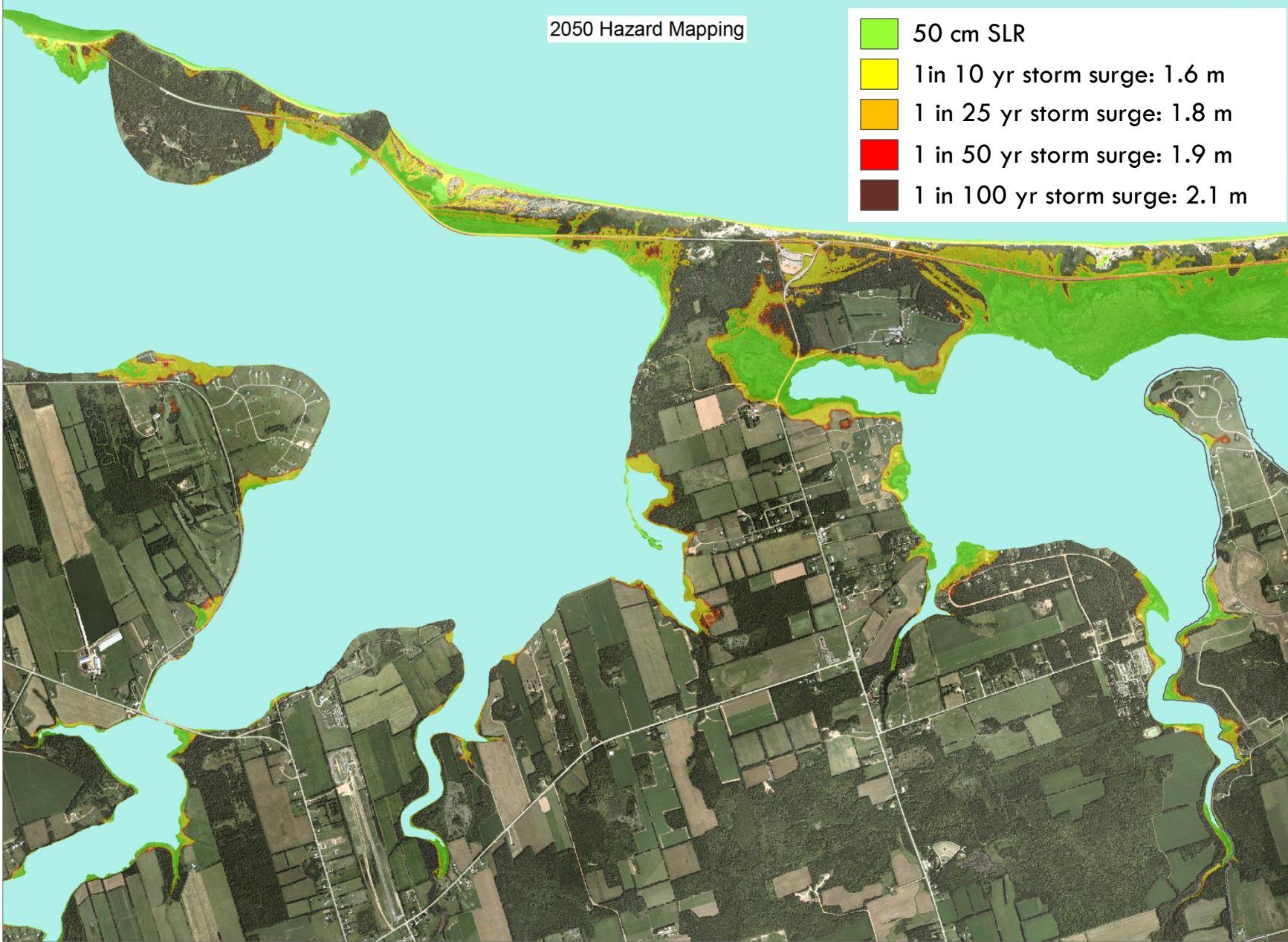
2050 Hazard Mapping

- 50 cm SLR
- 1 in 10 yr storm surge: 1.6 m
- 1 in 25 yr storm surge: 1.8 m
- 1 in 50 yr storm surge: 1.9 m
- 1 in 100 yr storm surge: 2.1 m



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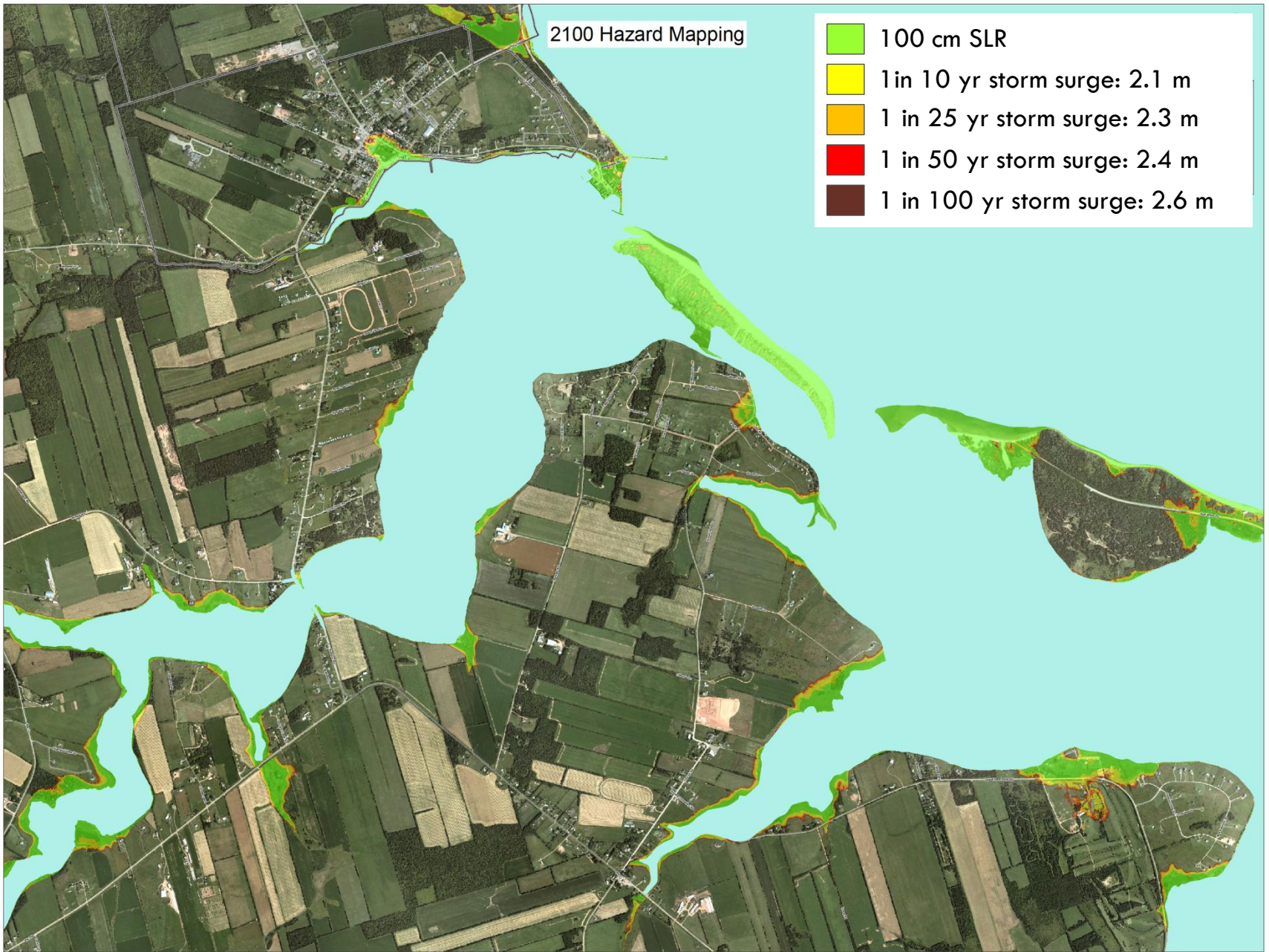
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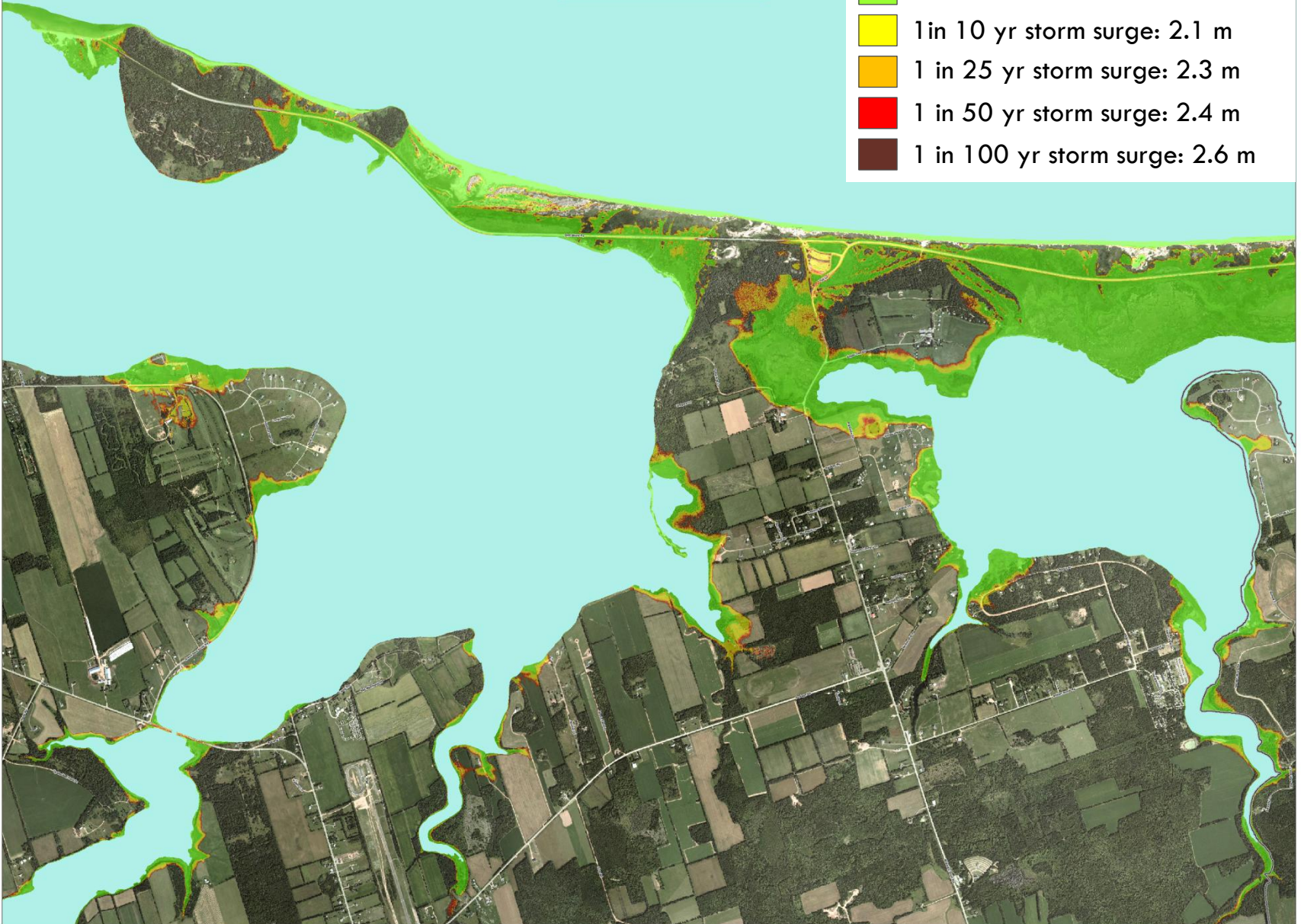
2100 Hazard Mapping

- 100 cm SLR
- 1 in 10 yr storm surge: 2.1 m
- 1 in 25 yr storm surge: 2.3 m
- 1 in 50 yr storm surge: 2.4 m
- 1 in 100 yr storm surge: 2.6 m



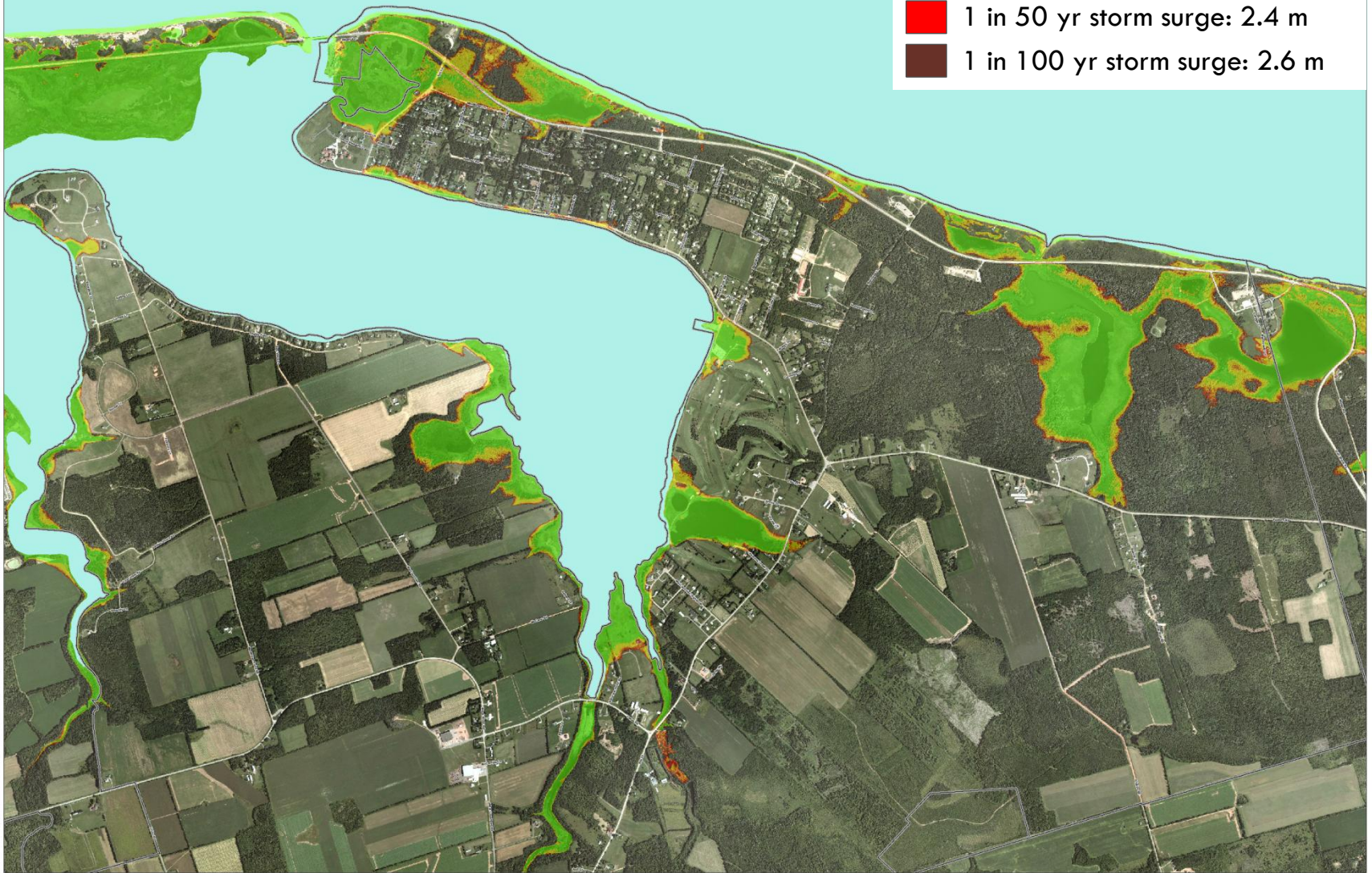
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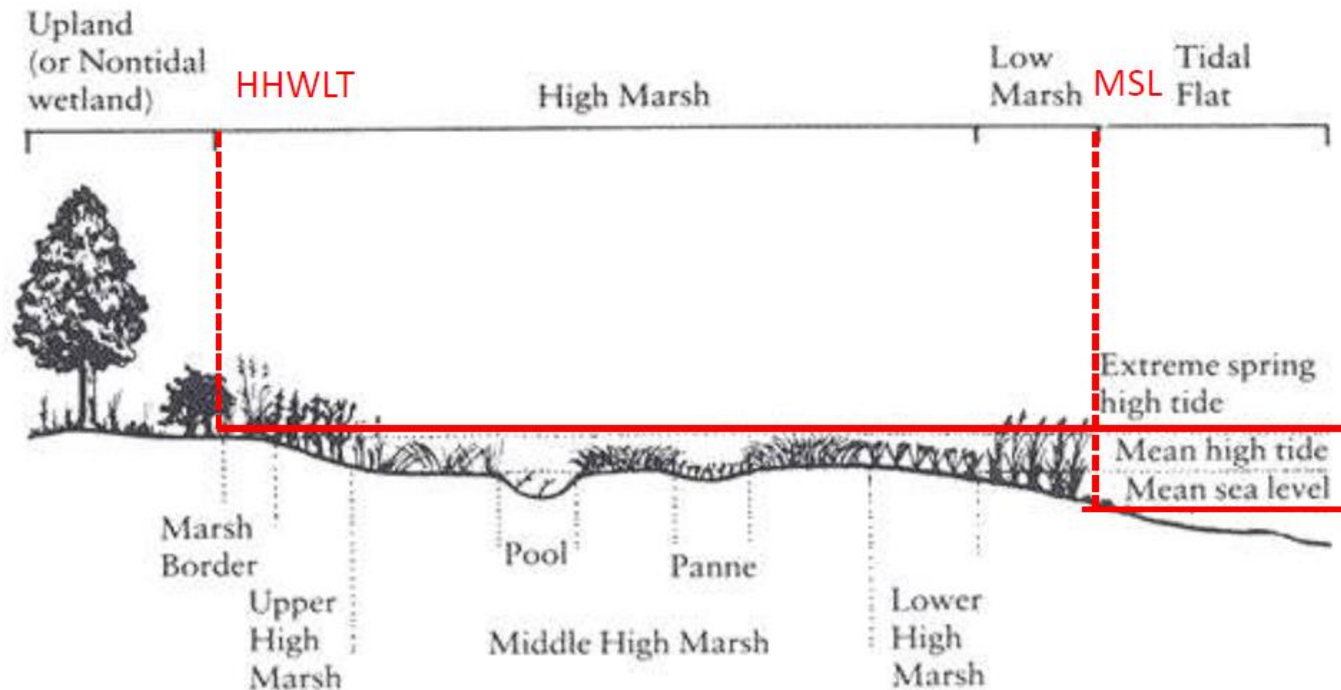
Flood risk vs development

(e.g. residences, businesses, infrastructure)



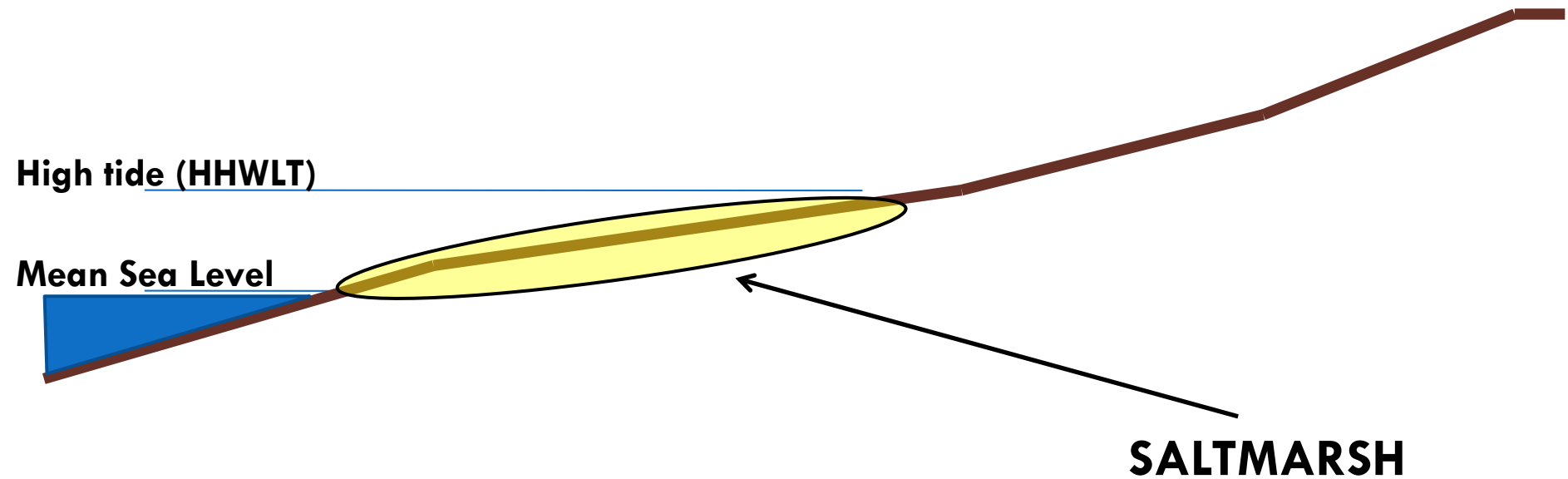
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Salt Marsh Zonation in PEI



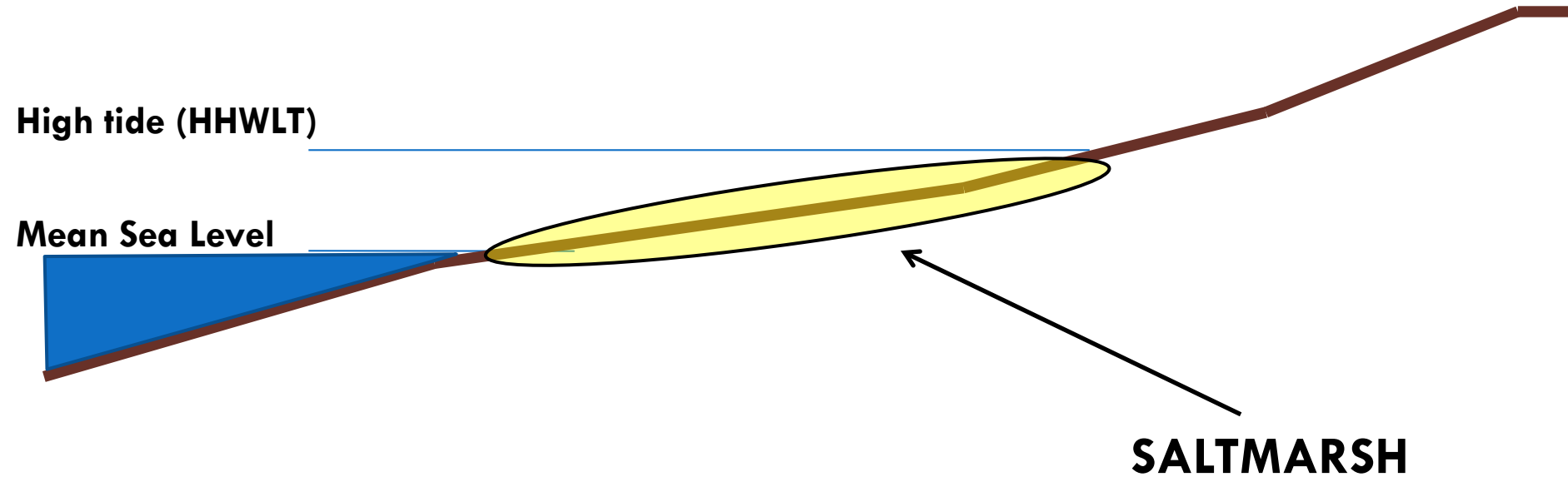
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2010



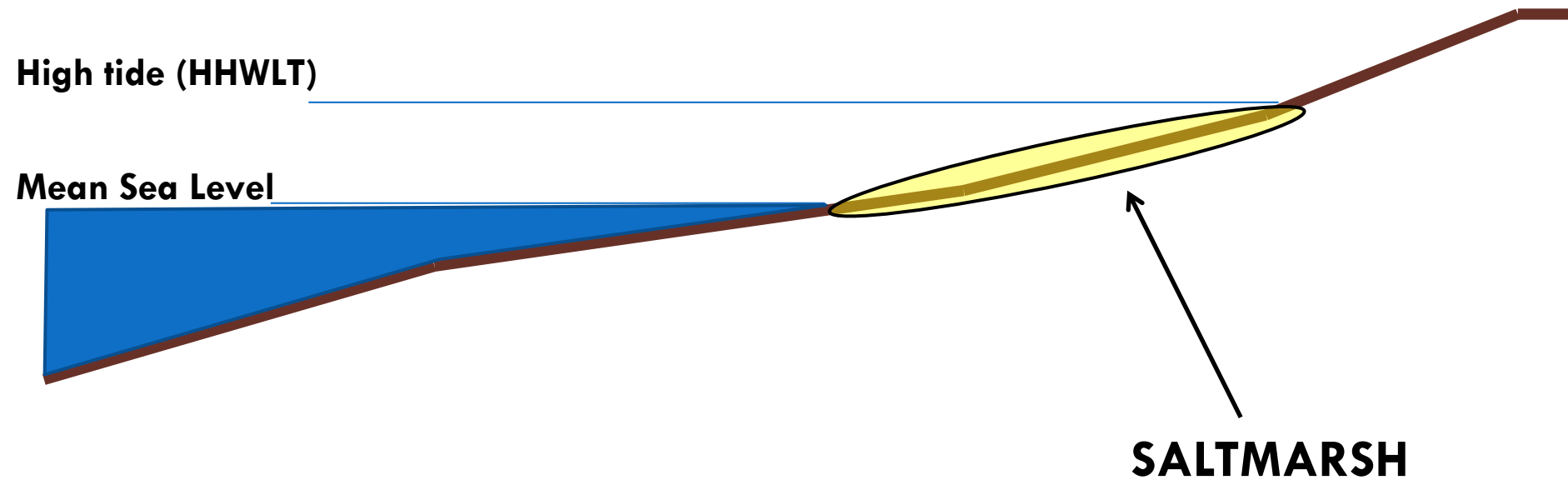
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2050



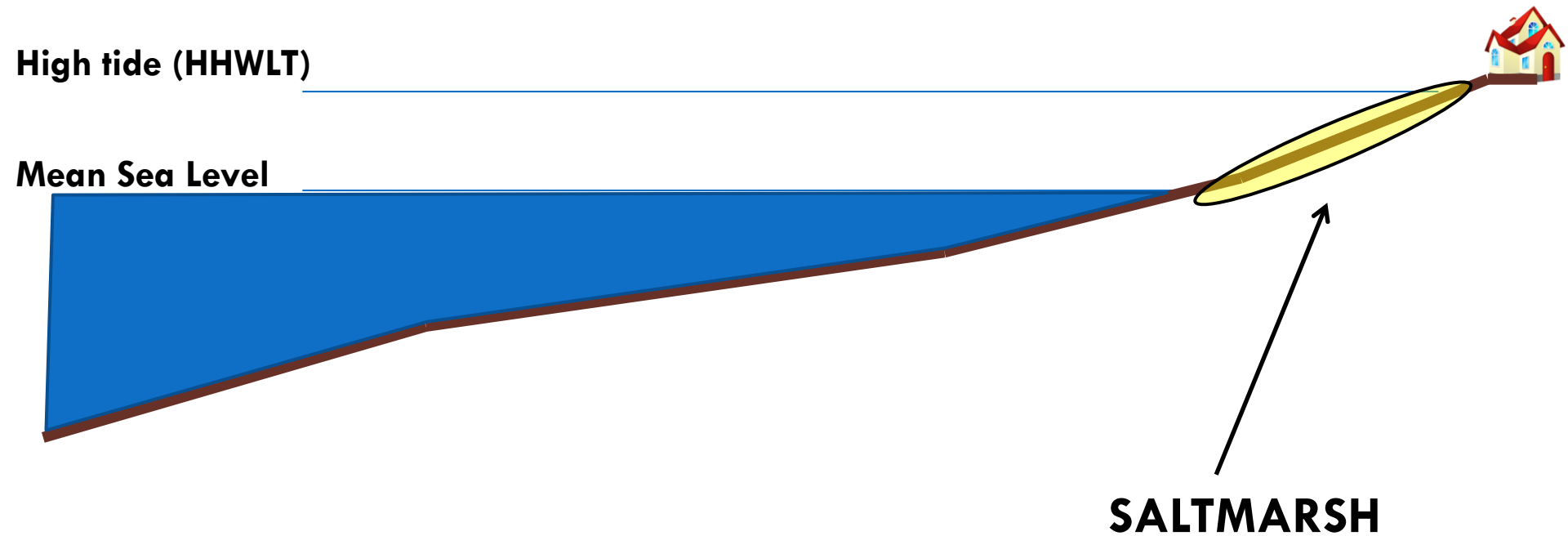
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2100



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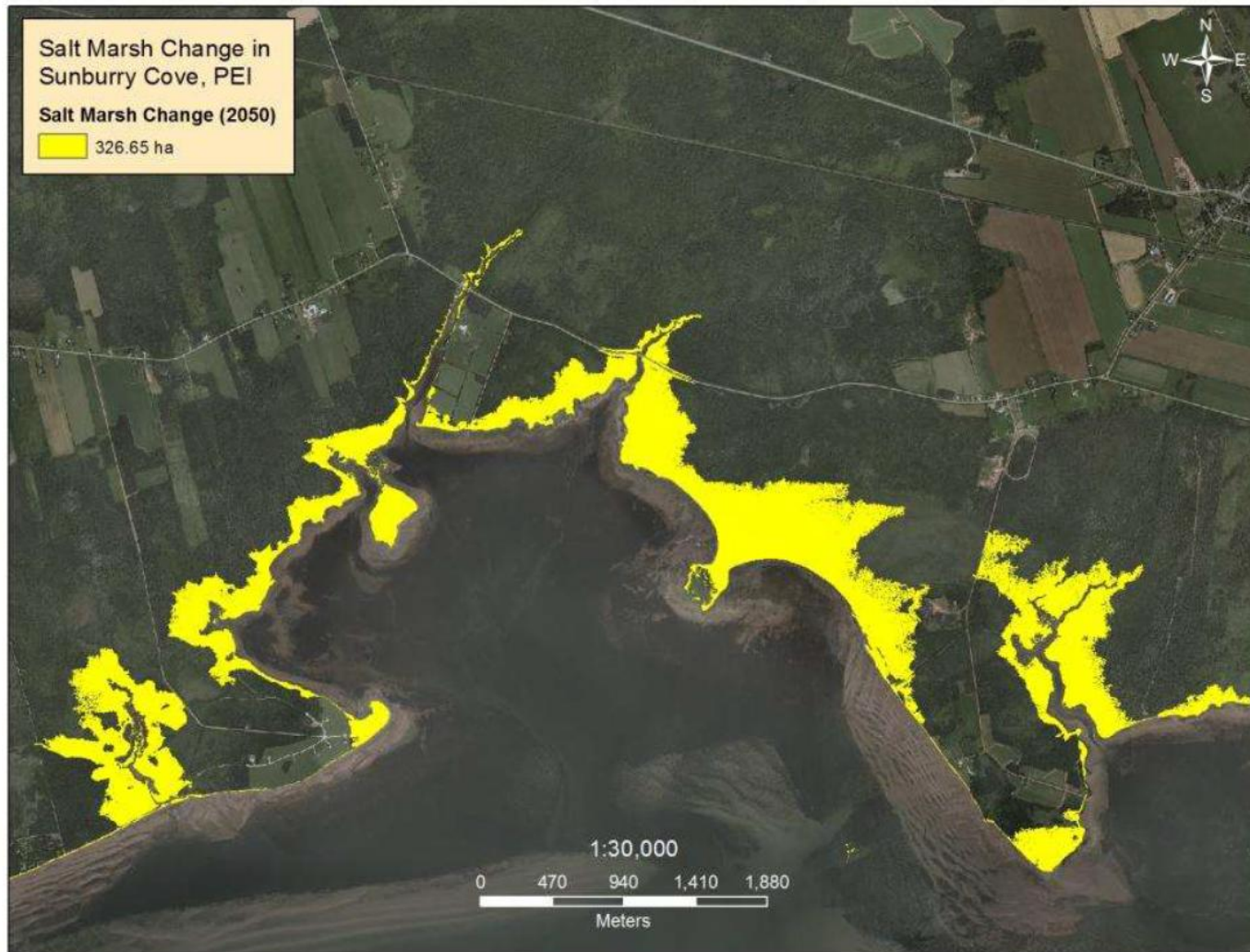
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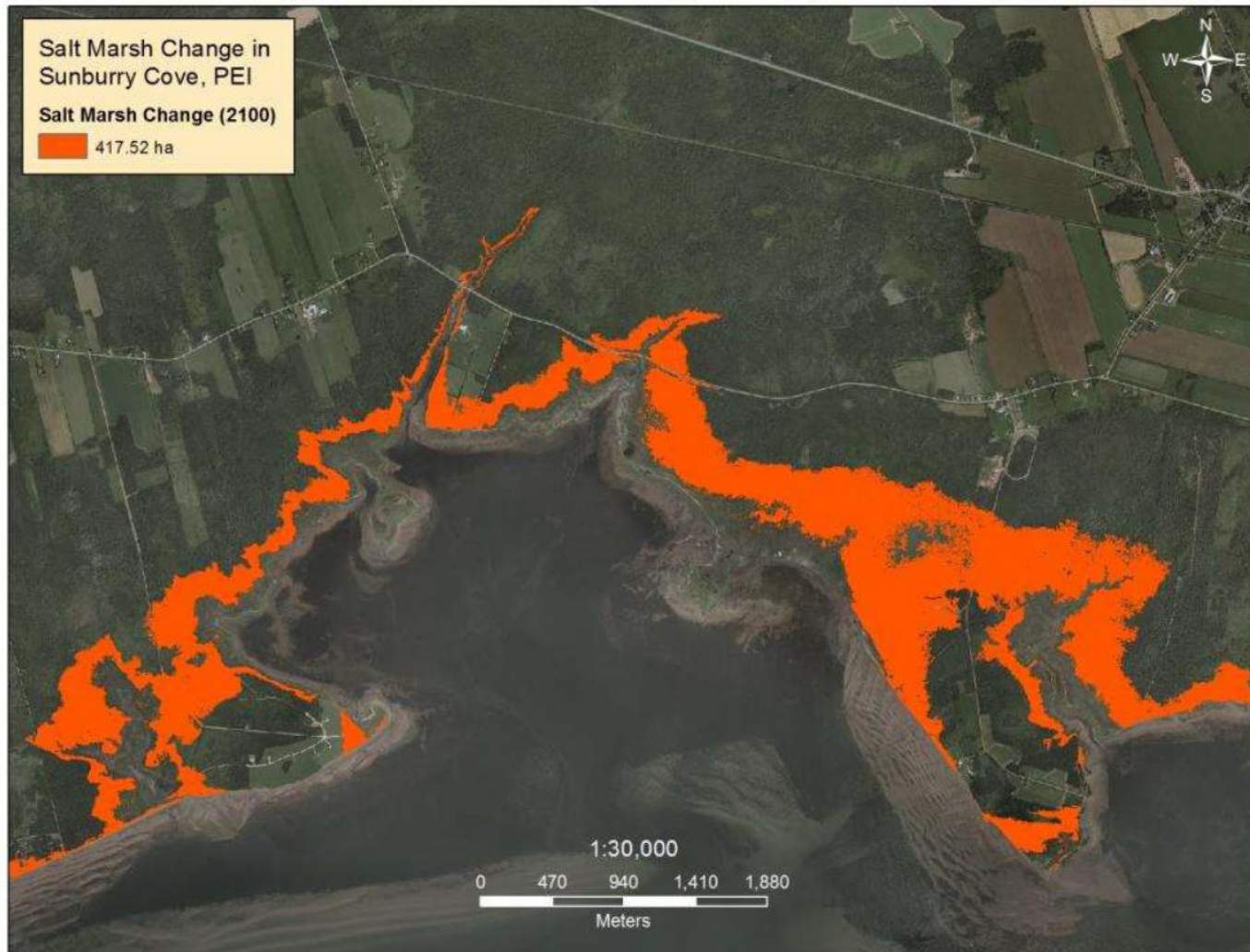
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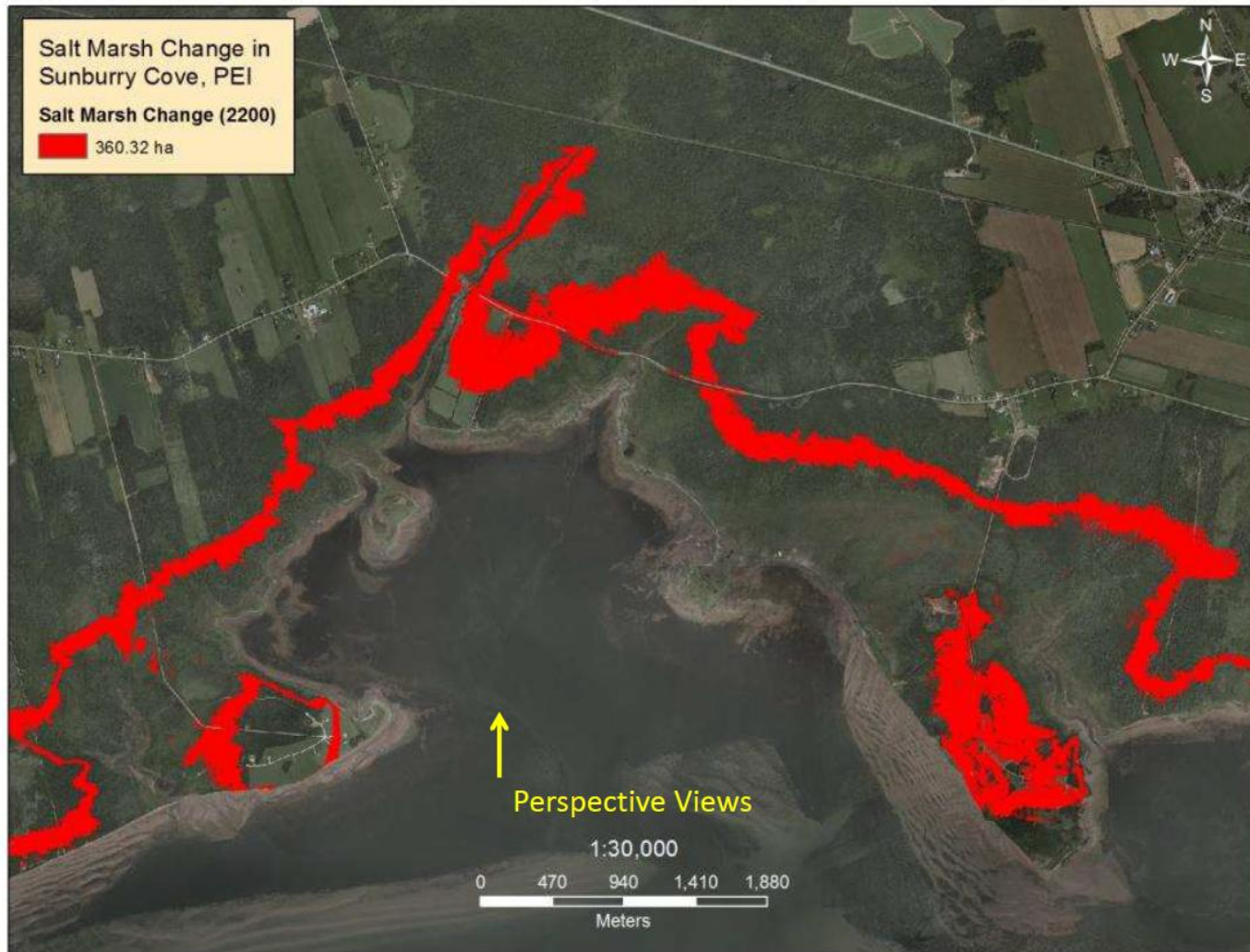
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Is extreme weather the new normal?

No easy answers, suggests Canada's weather guru David Phillips

By Janet Davison, CBC News Posted: Aug 8, 2013 5:11 AM ET | Last Updated: Aug 8, 2013 10:05 AM ET



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What next?

Review the potential impacts:

- ❑ Longer growing season
- ❑ Warmer water
- ❑ More sea lettuce
- ❑ More runoff
- ❑ More shoreline erosion
- ❑ More coastal flooding
- ❑ Saltmarsh migration

How will these impact the work of the Friends of Covehead and Brackley Bay?

How will FCBB need to respond to these challenges?

How might FCBB work with local governance (e.g. North Shore Municipality) on these issues?

SHORELINE EROSION AND FLOOD RISK IN THE COVEHEAD / BRACKLEY BAY AREA

Thank you!



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