

INTRODUCTION TO COASTAL PROCESSES



Coastal Conversations:
Session 1

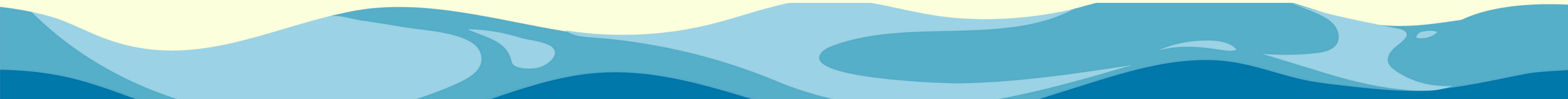


In partnership with
Canada

	Monday 6-7pm	Tuesday 2-3pm	Wednesday 2-3pm	Thursday 5-6pm	Friday 2-3pm
	Charlottetown	St. Peters Bay	Tyne Valley	Wood Islands	North Rustico
	Rotary A Auditorium-Charlottetown Library	UPEI Centre for Climate Change and Adaptation	Cavendish Farms Community Events Centre	Plough The Waves Community Hall	Cultural Centre Room-Eliyahu Wellness Centre
Introduction to Coastal Processes	July 7th	July 8th	July 9th	July 10th	July 11th
Coastal Change Monitoring and Results on PEI	July 14th	July 15th	July 16th	July 17th	July 18th
Watersheds and Nature Based Actions	July 21st	July 22nd	July 23rd	July 24th	July 25th
Coastal Monitoring at Home	July 28th	July 29th	July 30th	July 31st	August 1st
Coastal Policy on PEI	August 4th		August 6th	August 7th	August 8th

PEI'S COASTAL LANDSCAPE

- ▶ PEI has over 3,000 km of coastline
- ▶ Diverse landforms: cliffs, beaches, dunes, saltmarshes
- ▶ Dynamic and changing due to natural forces and human influence
- ▶ Vital for wildlife, tourism, recreation, and culture



Coastal Hazards: What You Need to Know

Living near the coast comes with natural beauty, and natural change. Understanding how and why our coastlines shift helps us prepare and adapt.

What Are Coastal Hazards?

Coastal hazards are natural forces that affect shorelines. In Prince Edward Island, these include:

- Erosion – gradual or episodic loss of land from waves, rain, and ice.
- Storm surges – high waters during strong storms.
- Flooding – the temporary movement of water onto land that is normally dry, often affecting low-lying or poorly drained areas.
- Sea level rise – slowly raising ocean levels linked to climate change.

Why Does This Matter?



Coastal hazards become risks when they affect people, property, or nature. That's why we monitor shoreline change, to understand which areas are most at risk and to support informed decision-making.

Ask yourself:

- Have I noticed changes to the shoreline over the years?
- Do I have natural buffer zones like vegetation or dunes?
- How close is my home or infrastructure to the cliff edge?

SHORE TYPES ACROSS PEI

- ▶ Cliffs & Bluffs: 47% of coastal shorelines
- ▶ Low Plains: 12% of shoreline
- ▶ Dunes: 481 km, mostly north shore
- ▶ Saltmarsh: 54% of estuary shoreline
- ▶ Estuaries: transition zones, mix of fresh/salt water



COASTAL EROSION PROCESSES

- Coastal erosion is natural but accelerated by storms and human activity
- Key processes: cliff undercutting, frost wedging, slope failure, overtopping and overwash, stormwater gullies, human activity
- Post-Tropical Storm Fiona caused erosion >26m inland in places

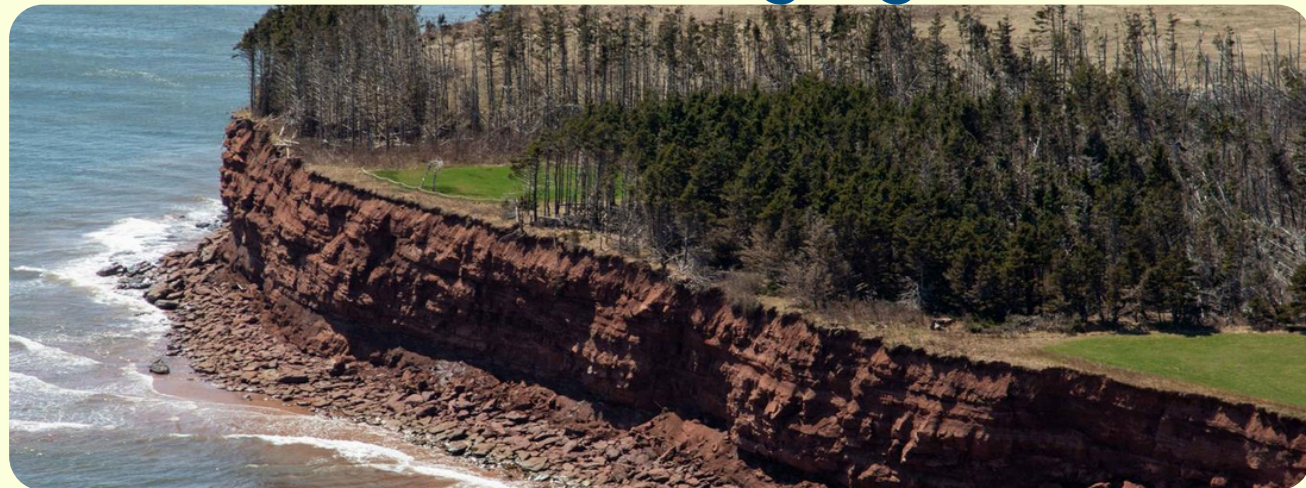
Cliff Undercutting



Slope Failure



Frost Wedging



Stormwater Gullies



Overtopping & Overwash

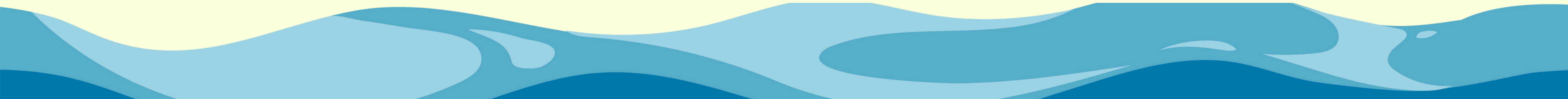


Human Activity



SHORELINE HARDENING AND ITS LIMITS

- ▶ Shoreline hardening installations protect property, not coastlines
- ▶ Can cause 'end scouring' and loss of beach and access
- ▶ Disrupts natural coastal habitat
- ▶ Disrupts natural erosion and dune/beach rebuilding processes



SEA LEVEL RISE ON PEI

- ▶ Sea levels expected to rise 30–35 cm by 2050, 75–80 cm by 2100
- ▶ PEI is also subsiding, compounding the effect
- ▶ Floodplain will expand inland, especially in low areas



SALTMARSHES AND SALTMARSH MIGRATION



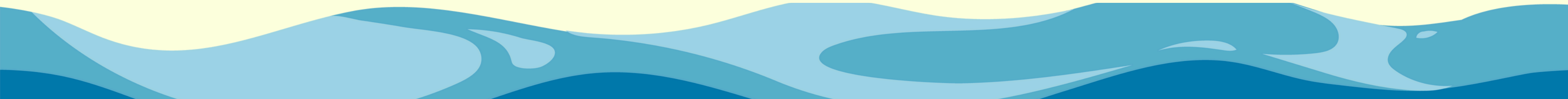
Saltmarshes can adapt if allowed to migrate inland

Development and seawalls block this, causing 'coastal squeeze'

1,300 km of PEI estuarine shoreline is saltmarsh

CHANGING OCEAN CONDITIONS

- ▶ Warming waters (+0.347 °C/decade) shift marine species
- ▶ Acidification harms shell-building creatures (e.g., mollusks)
- ▶ Less ice cover can lead to more winter storm damage

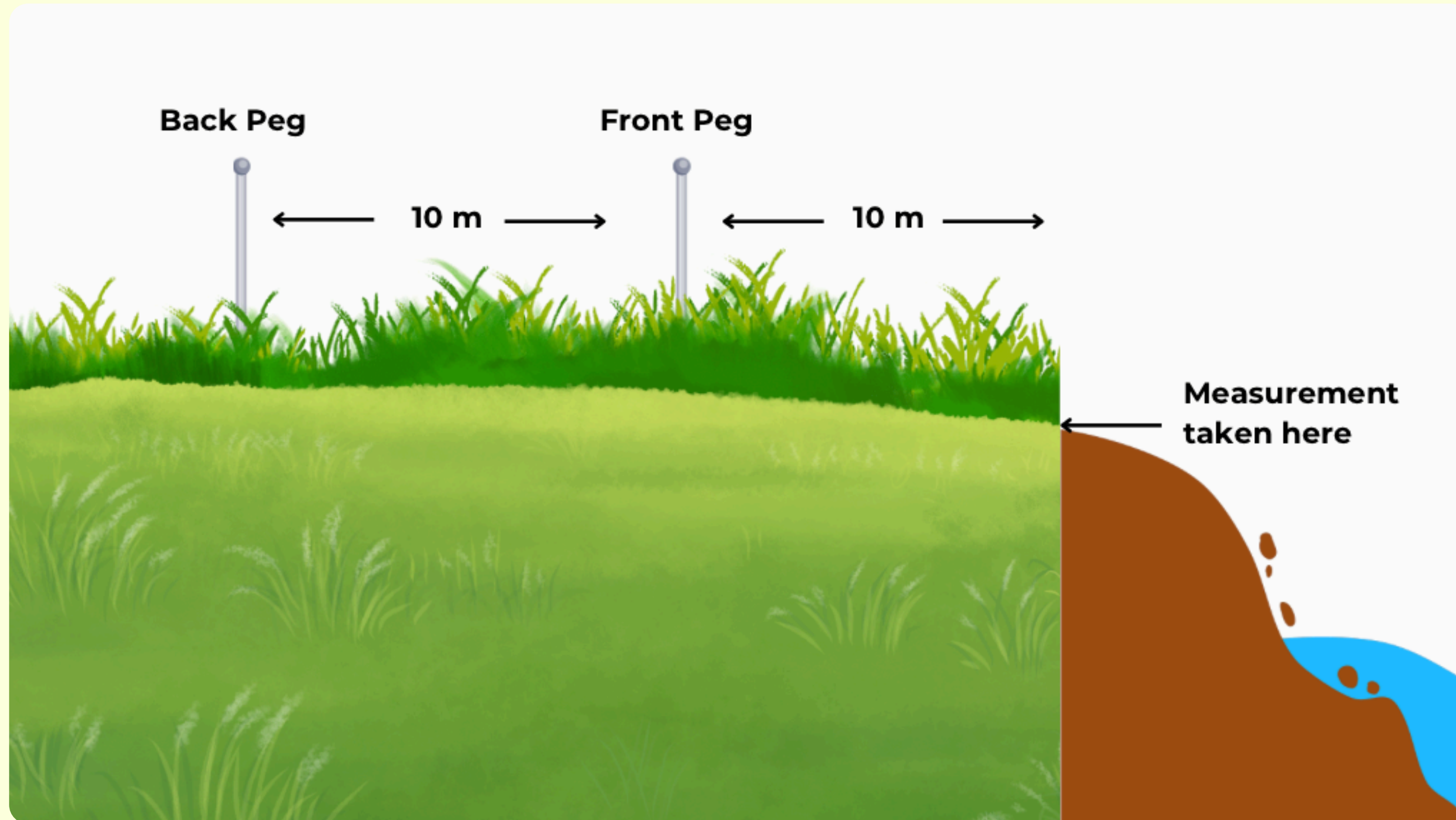


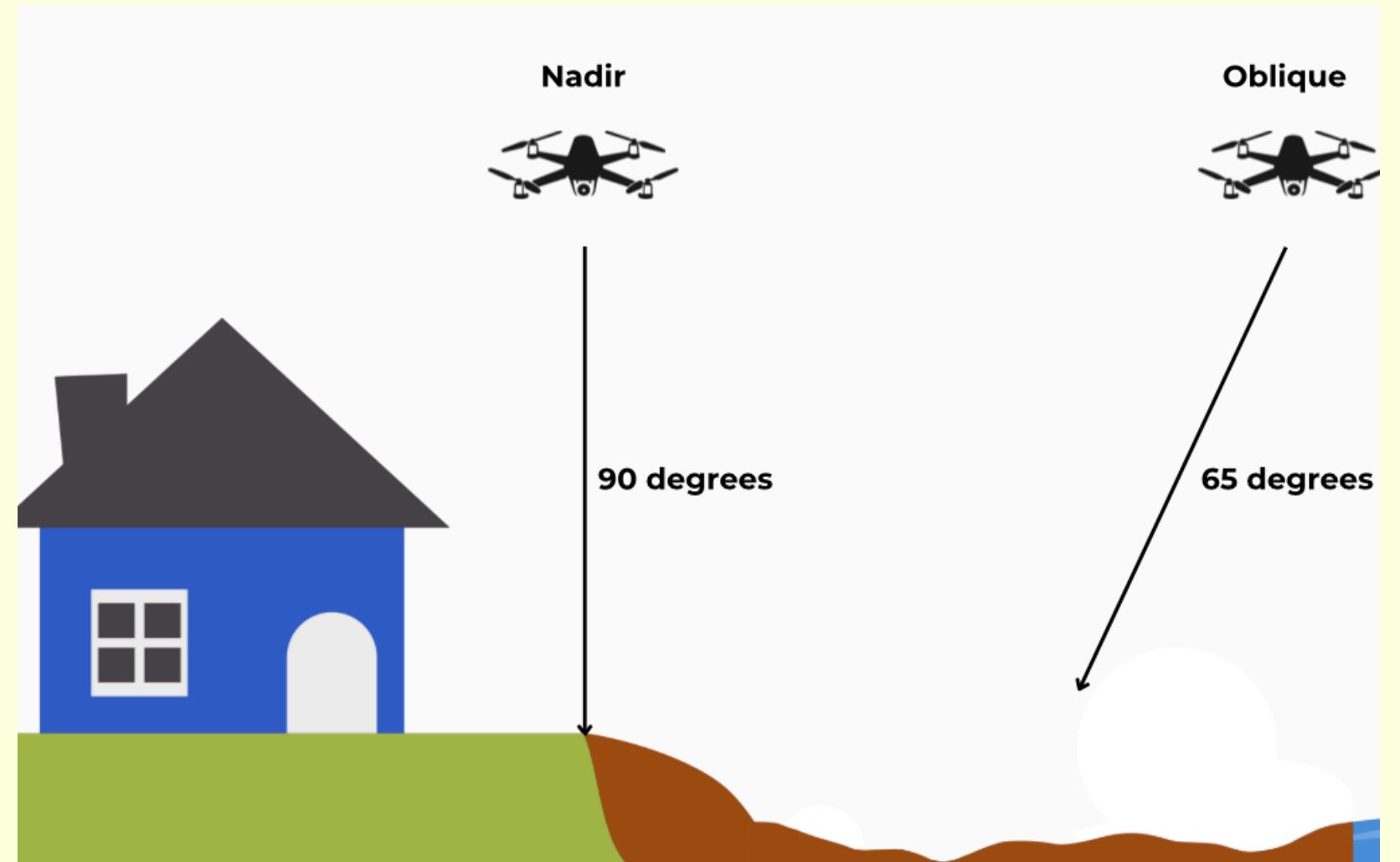
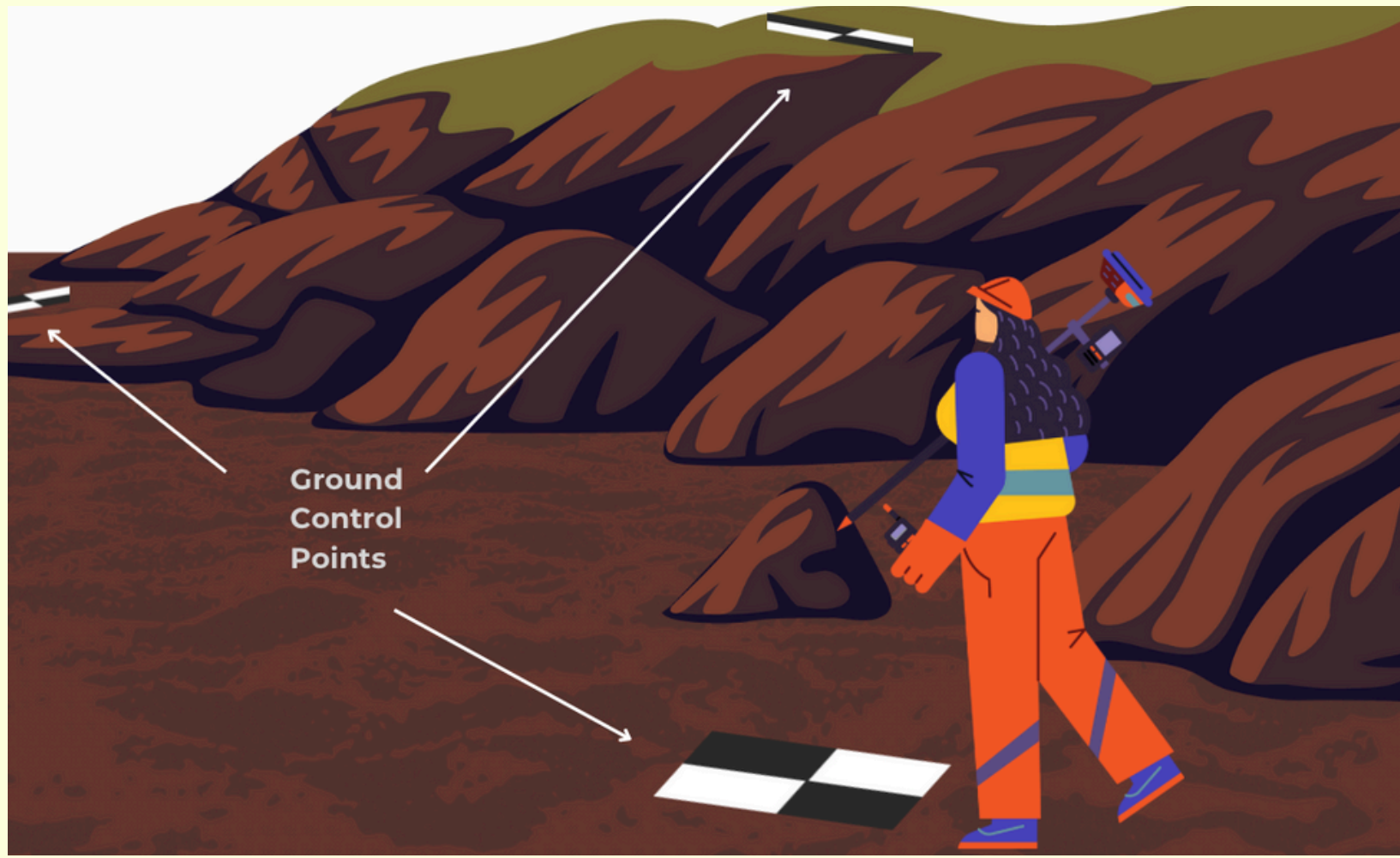
STORM SURGES AND FLOOD HAZARDS

- ▶ 1-in-100 year flood now more likely due to climate change
- ▶ Fiona caused surge >2.8m in North Rustico
- ▶ Coastal floodplain includes 194 km² (~3% of PEI land area)

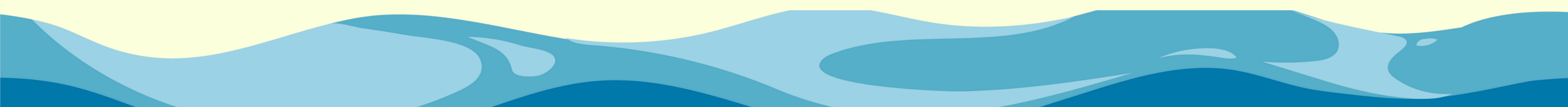


HOW WE MEASURE COASTAL CHANGE

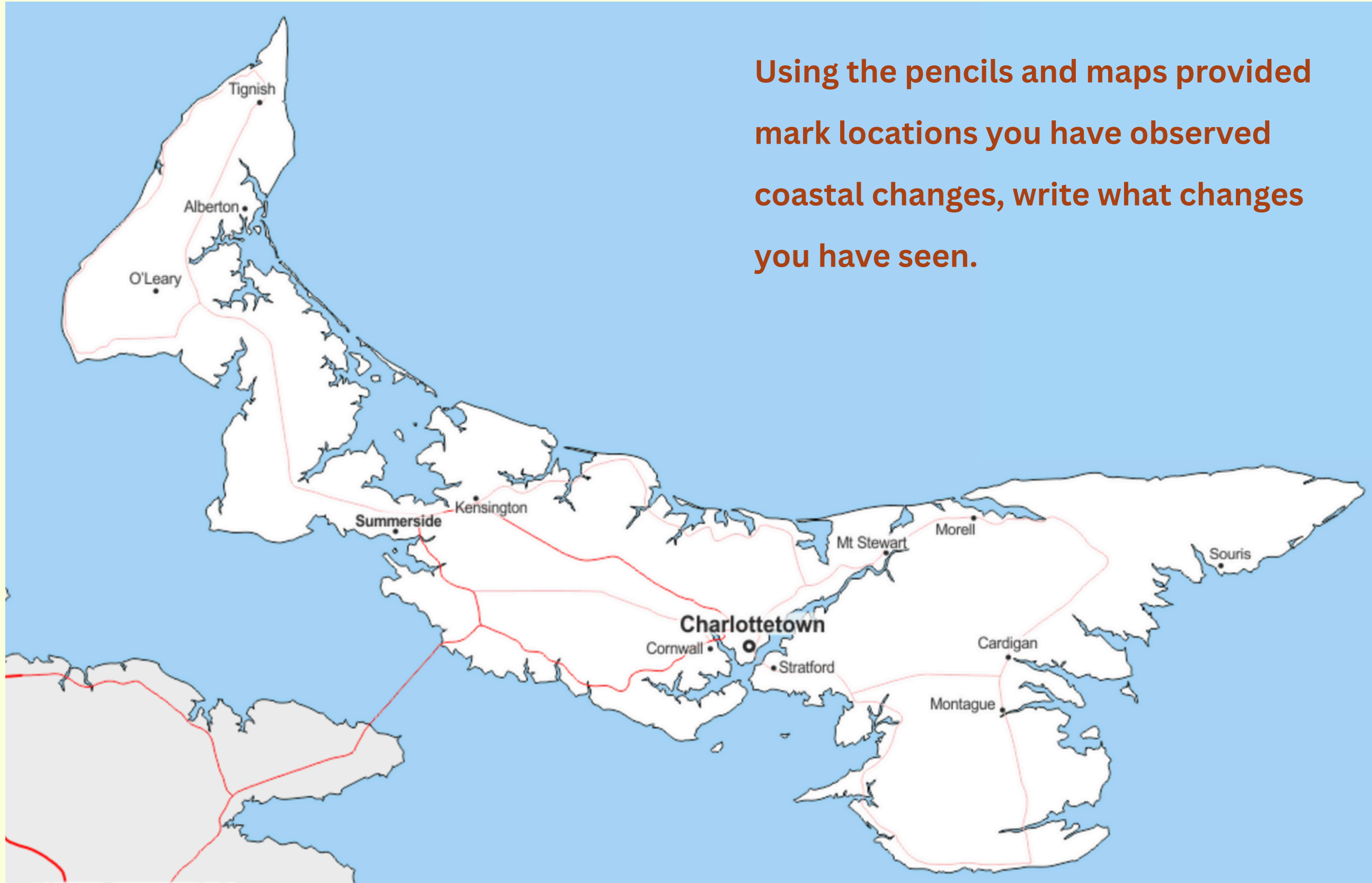




LOOKING AHEAD: ADAPTATION AND ACTION

- ▶ Avoid building too close to the coast
 - ▶ Support dune and wetland restoration
 - ▶ Combine natural and built solutions (e.g., living shorelines)
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ACTIVITY: MAPPING CHANGES



Using the pencils and maps provided mark locations you have observed coastal changes, write what changes you have seen.

POST FIONA IMAGERY

