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# Impacts of Shoreline Structures on the Coastal Landscape

Wednesday June 13, 2018

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# Coastal Impacts of Climate Change

## Coastal Flooding + Accelerated Rates of Coastal Erosion





# Coastal Adaptation Strategies

Protection



Accommodation



Retreat/Abandonment



# 'Protection' (with shoreline structures) is the most common way to adapt existing properties and infrastructure





# Shoreline Structures (by scale)

Critical Infrastructure (ex. marinas, bridges, infill waterfront development, etc.)



# Shoreline Structure (by scale)

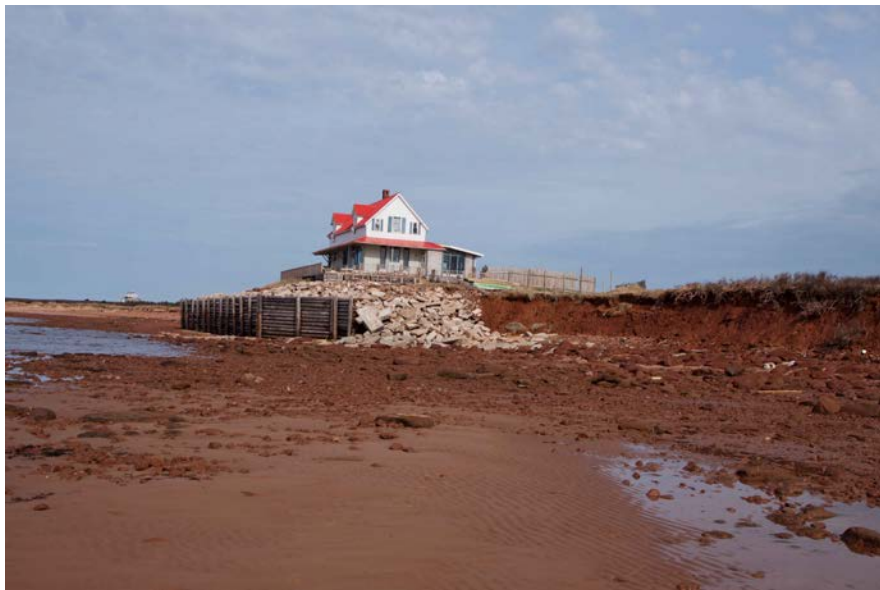
Community Initiatives – a planned strategy over an extended length of waterfront





# Shoreline Structures (by scale)

Private properties (On PEI max. length is 100m but no restriction on cumulative lengths)



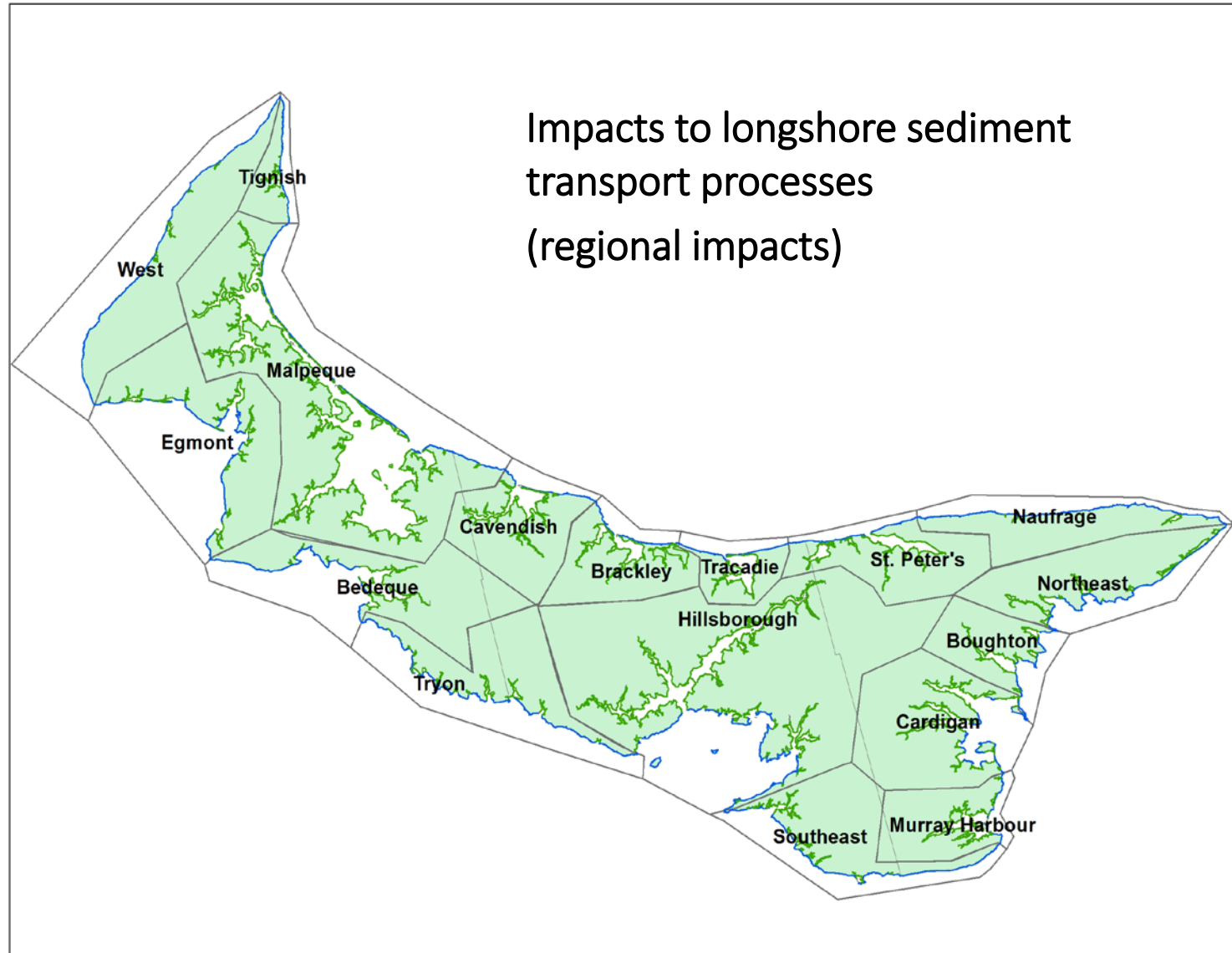
It's true that *if* designed appropriately and maintained over time, shoreline structures *can* be an effective adaptation strategy to mitigate risks to coastal properties and coastal infrastructure. **But...**



Tsunami Sea Wall. Hamaoka, Japan.  
[www.japantimes.co.jp/news/2016/03/31/national/sea-wall-guard-tsunami-completed-hamaoka-nuclear-plant/](http://www.japantimes.co.jp/news/2016/03/31/national/sea-wall-guard-tsunami-completed-hamaoka-nuclear-plant/)

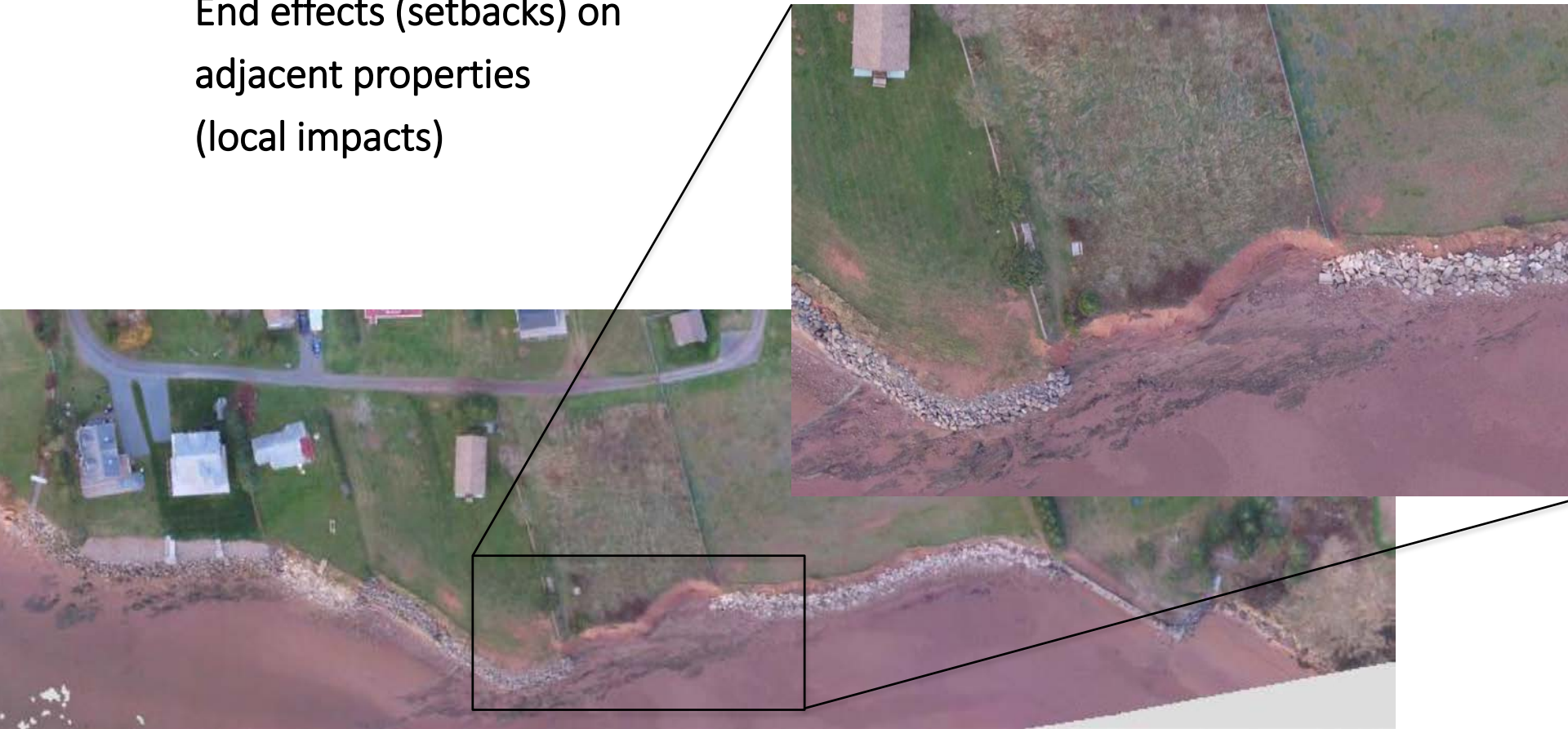


The installation of shoreline structures *can* also result in:



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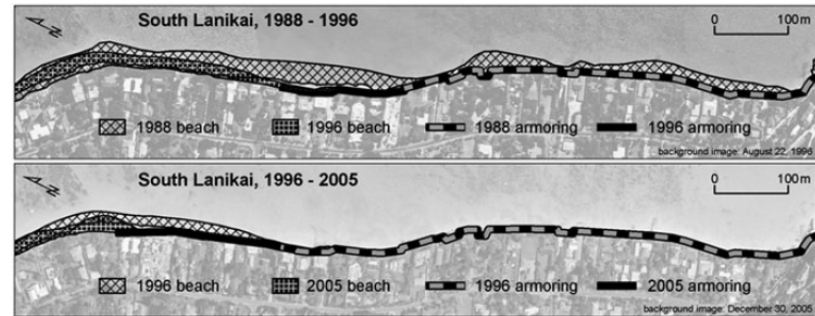
End effects (setbacks) on adjacent properties (local impacts)





## The installation of shoreline structures *can* also result in:

Impacts to the sandy beach width and/or sand profile fronting the stabilization structures

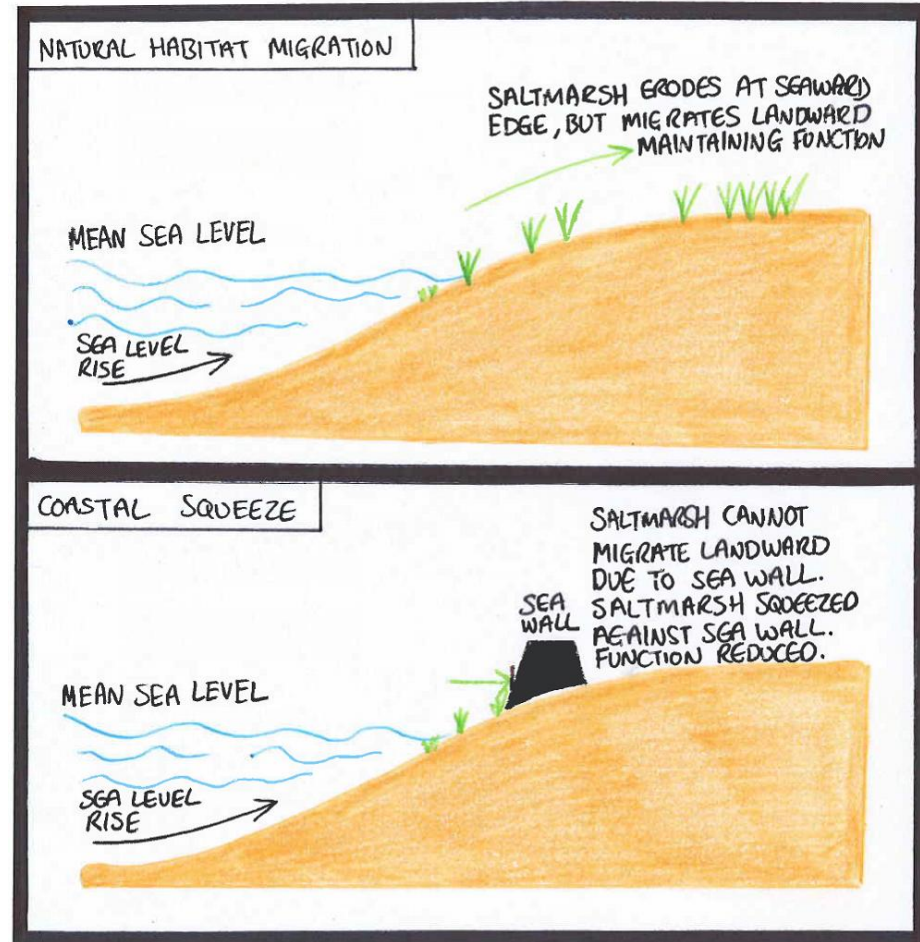


Romine & Fletcher, 2012



# The installation of shoreline structures *can* also result in:

Habitat disturbance (terrestrial, transitional, and marine)





The installation of shoreline structures *can* also result in:

Structure failures and hazards due to lack of maintenance (public safety concern)





## The Question:

Do the benefits of shoreline structures, as an adaptation strategy to address the coastal risks of climate change, justify the potential long-term environmental and socio-cultural impacts to the coastline of Prince Edward Island?



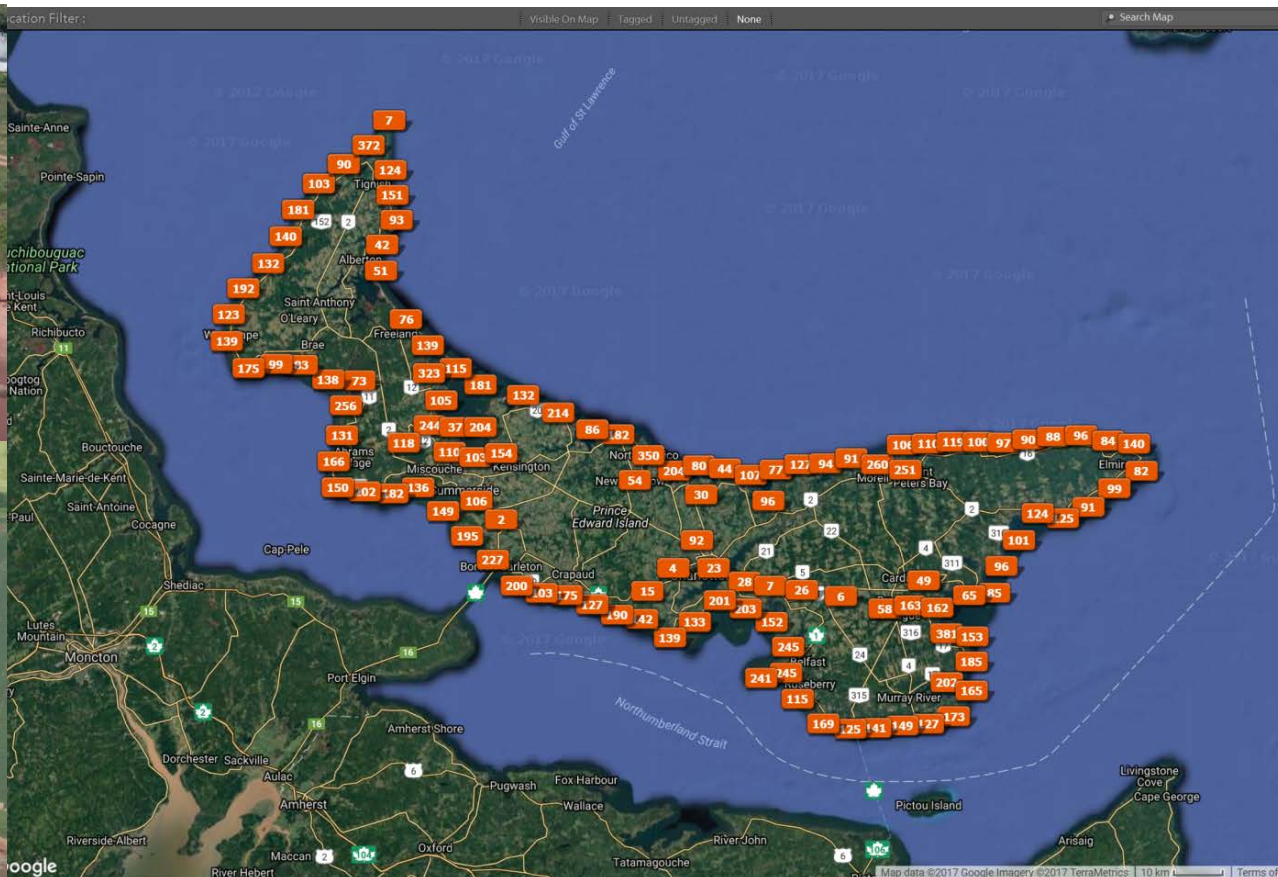
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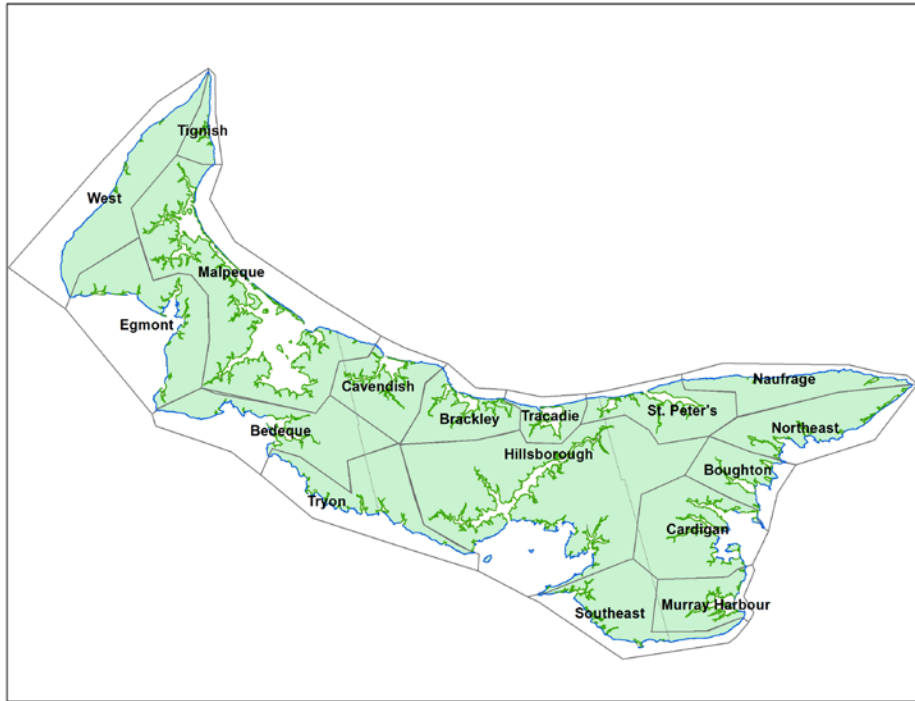


# Step 1. Shoreline Structures Inventory

- Location, type, approximate age and current condition of each shoreline structure;
- Adjacent land use or type of infrastructure protected; and
- Presence/absence of shoreline vegetation, environmental buffer and development setbacks



## Step 2. Evaluation of Impacts Observed (Case Studies)



Impacts, including cumulative impacts, will be documented at the regional (littoral cell) and local scale.





## Step 3. Coastal Policy Analysis

- Municipal development policies and regulations;
- Provincial environmental, planning and land use development policies and regulations;
- Federal environmental impact assessment and the proposed oceans protection plan; and
- **Compliance and Enforcement at all levels of Government**



Coastal vegetation buffer maintained; no armouring



No vegetation buffer; shoreline armouring





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