Making Room for the River

Dykelands and Climate Change

Figure 1: High spring tide in St. Croix River at Trunk 14 on Sept. 29, 2023

- Bay of Fundy dykelands are highly vulnerable to the effects of climate change - subsidence, dyke elevations, aboiteaux.
- Dykeland system in Nova Scotia has 241 km of dykes and 250 aboiteaux – challenge to maintain all in current location with climate change.
- Relative sea level rise projections for Hantsport 0.33 m by 2055 and 0.90 m by 2100 (Daigle, 2016).

Figure 2: Dykelands drained by aboiteaux – one way gate

- Best practices internationally to mitigate the effects of climate change in dyked areas – combine grey with green infrastructure.
- Provide room for the river to 'breathe' to allow to natural meandering of tidal rivers and increased capacity to absorb storm water.
- Overall provides increased resiliency of dykeland systems.

Figure 3: Oblique aerial photo of realigned dyke at Belcher St. Marsh, Cornwallis River in Oct. 2022

Flooding

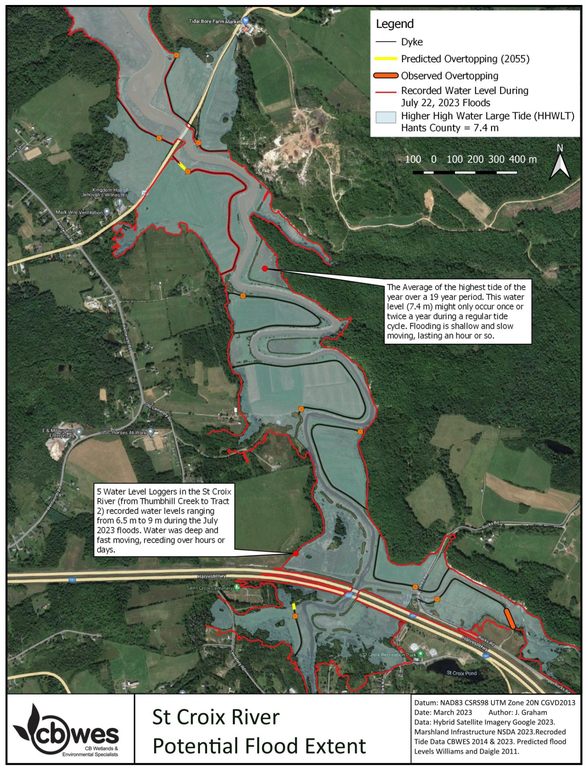

Figure 4: Modelled flood extent of HHWLT (7.4m CGVD2013) and July 22, 2023 flood event.

Figure 5: Freshwater flooding in St. Croix dykeland after tragic flooding on July 22, 2023 (photo taken July 23, 2023 by Graeme Matheson, NSDA)

- Dykelands in tidal river systems are vulnerable to flooding with intense rainfall events, made worse during high tides. They are also susceptible, but less so, to storm surge.
- Average annual precipitation is projected to increase by 14% for the 2051-2080 period (Windsor – www.climatedata.ca), and short duration, high intensity events will likely occur more often.
- Sea level rise increases high tide water levels over time

Erosion

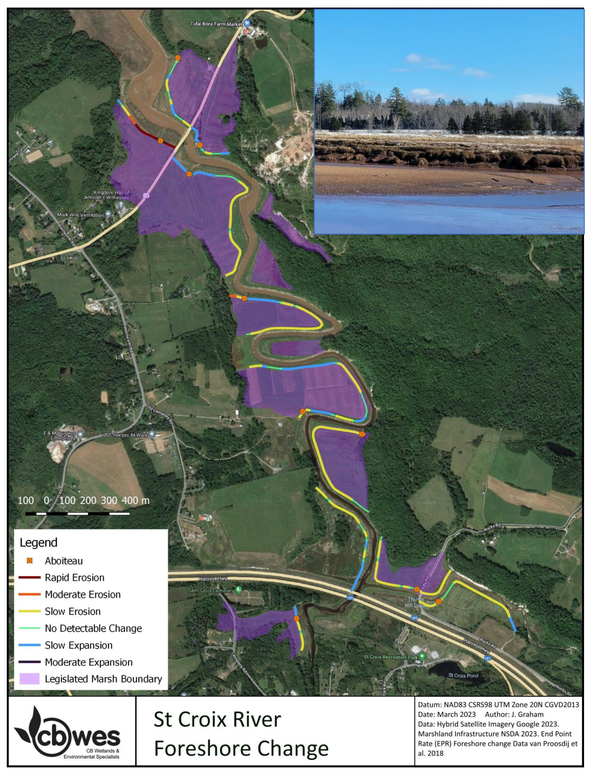

Figure 6: Foreshore marsh change rates based on historical aerial photos in GIS

Figure 7: Eroding foreshore marsh and vulnerable dyke section on Tract 4 (photo taken on July 27,2022 by Graeme Matheson, NSDA).

- Foreshore marsh provides a buffer for wave energy & erosion.
- Eroded material is transported & may form new marsh elsewhere
- Increasing space for marsh development is proven to protect dykes

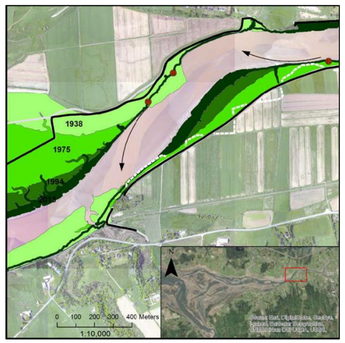

Figure 8: Example of foreshore marsh exhibiting cycles of erosion & growth

Making Room for Wetlands

www.transcoastaladaptations.com
transcoastaladaptations@smu.ca