



Subject: *Plan Update - Fundy Vulnerability*
To: CAO for Planning Advisory Committee, June 9, 2022
Date Prepared: June 21, 2022
Related Motions: None
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Approved by: John Woodford, Director of Planning & Development

Summary

As part of the ongoing plan update, Planning staff are preparing background papers to discuss and propose approaches to different land use issues within the Municipality. The current background paper discusses land use planning for areas along the Fundy Shoreline.

Financial Impact Statement

The Community Plan Update has been budgeted for in the 2022/2023 Municipal Budget.

Recommendation

Authorize staff to prepare amendments to land use policies and regulations based on the direction identified in the staff report on Fundy Vulnerability and endorse the letter in Appendix A.

Recommended Motion

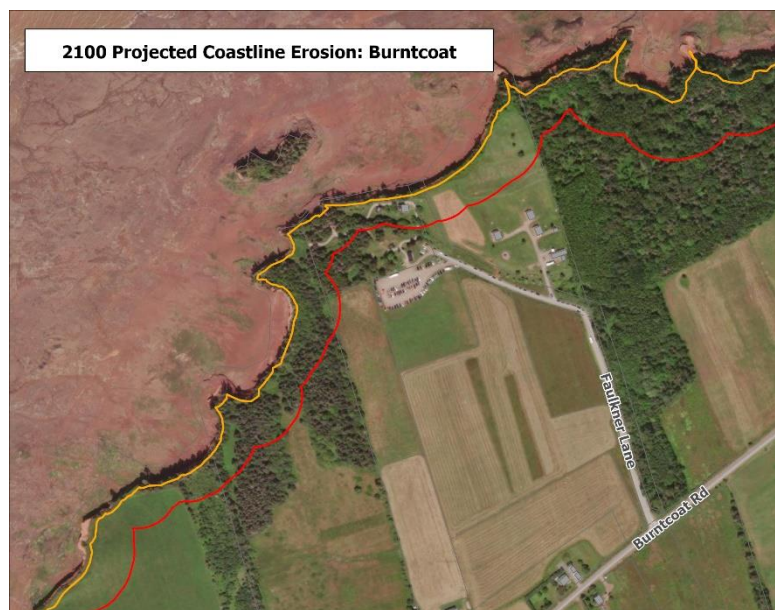
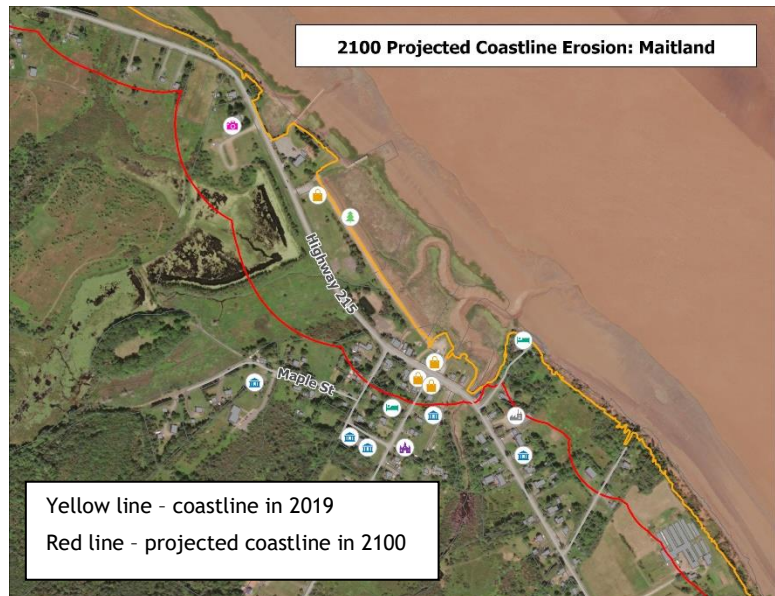
Move that the Planning Advisory Committee recommend that Council authorize staff to prepare land use policies and regulations for land along the Fundy Shoreline, based on the direction in Staff's report dated June 9, 2022; and endorse the letter to the Minister of Environment and Climate Change.

Background

To understand the impacts of the Bay of Fundy tides on the coastal area of East Hants, the municipality contracted The Nova Scotia Community College - Applied Geomatics Research Group (NSCC-AGR) to produce vulnerability mapping of the Fundy shoreline area. The timing of this work coincided with the need to create new policies and regulations for the future planned area of the municipality.

Coastal Erosion is the natural breakdown and removal of rocks and soil along the coastline. Coastal erosion happens mainly as a result of wave action and the freeze-thaw cycle. AGRG identified the areas at risk from coastal erosion by analyzing maps from 1973 and 2013, plus lidar data from 2019. Using the maps and lidar distances between the location of the coastline at specific points in time enabled an erosion rate per year to be identified.

Coastal Flooding happens when seawater flows temporarily over low-lying (but normally dry) land that is near the coast. Coastal flooding typically happens as a result of storm surge - a temporary rise in sea level caused by an extreme weather event. Coastal flooding during a storm surge can be especially damaging if it happens during a high tide. Over time, as sea level continues to rise, coastal flooding caused by storm surge events will reach further inland.



Coastal erosion and flooding analysis was focused on 79 km of coastline between Walton and South Maitland. To generate the coastal erosion mapping, historical coastline positions were generated from georeferenced aerial photos of the entire study area were acquired from the Nova Scotia Geomatics Centre for the years 1973 and 2013. Lidar data from 2019 was used in place of imagery for the most recent coastal position. Using this i

The maps created detail areas vulnerable to coastal flooding and the areas vulnerable to coastal erosion. The following maps were created:

- Anticipated projected location of shoreline due to coastal erosion:
 - In 2050
 - In 2100
- Anticipated extent of area subject to coastal flooding:

- 1 in 25 year storm surge event & 1 in 100 year storm surge event for present day
- 1 in 25 year storm surge event & 1 in 100 year storm surge event in 2100 - this adds anticipated impacts to climate change.

Our data shows that the approximate area of land projected to be lost due to coastal erosion from 2019 to 2100 is almost 700 hectares (1,700 acres). Our data also shows that of that land there are 167 properties with buildings on them (288 buildings): 71 are agricultural use; 100 are residential; 15 are commercial/recreation/institutional; and 102 are accessory structures.

At the Planning Advisory Committee meeting in May 2022, Dr. Tim Webster presented the methodology for the vulnerability study. An online map was also prepared and made available to committee members. This map has been provided again to committee members. In addition to the electronic map, some maps are provided in this report of areas most affected by the predicted coastal erosion and storm surge flooding.

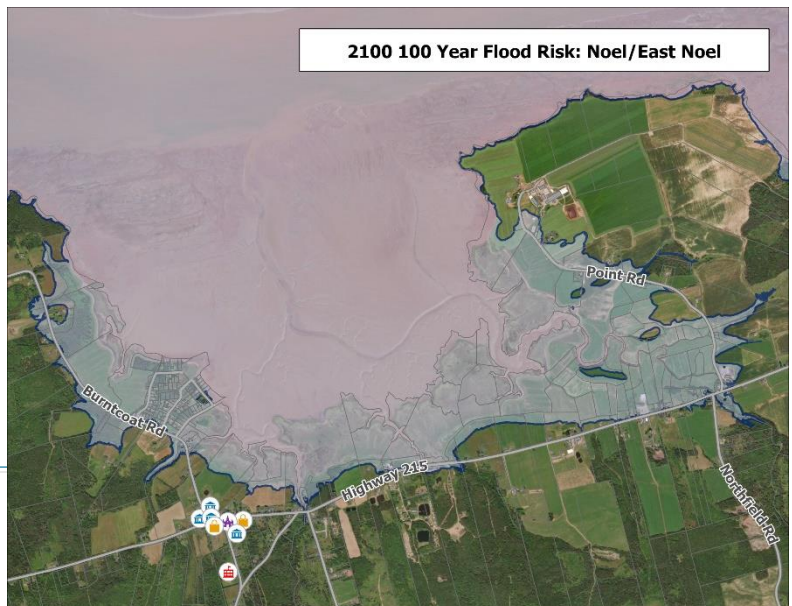
Coastal Protection Act

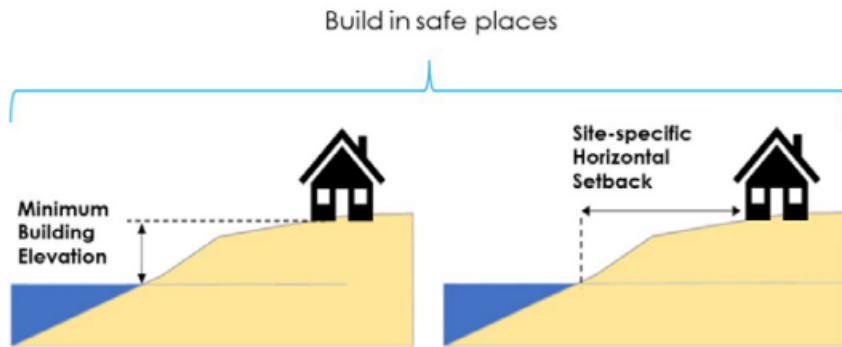
The Nova Scotia Coastal Protection Act was established to protect natural ecosystems and make sure that new homes and businesses are safer from sea level rise, coastal flooding and coastal erosion. The Nova Scotia government are currently working on regulations to implement the Act.

In 2021, the provincial government sought comments on the proposed regulations. The consultation document introduced how the provincial government sought to regulate land uses adjacent to the coastline with the introduction of a Coastal Protection Zone (CPZ). It was suggested that the CPZ would extend from the ordinary high-water mark inland a distance of between 80 to 100 metres. The final distance would be established in the final regulations and would apply along the entire coastline of Nova Scotia. Within this area building permits and construction would need to be compliant with two new setbacks:

- The minimum building elevation for different regions of the coast; and
- A horizontal building setback as determined for the property by a 'designated professional' as defined under the regulations. Setback will seek to ensure the building is located where it is safe from erosion throughout an 80 year planning horizon.

The following image has been taken from the consultation document on the regulations.





The regulations are being worked on and there is no information right now and what they might include. However, based on the consultation document prepared last year municipal staff anticipate that they will include a Coastal Protection Zone and within that zone property owners will have to hire a designated professional to identify a horizontal building setback.

Planning staff are concerned that even if the municipality implement regulations regarding setbacks due to the vulnerability mapping, that the province will still require property owners to hire a ‘designated professional’ to determine a setback based on a formula prescribed by the province. Staff feel that this places a duplication of regulation for a property owner. The municipal process will be much less onerous as property owners will not need to hire a ‘designated professional’ for each property. A letter has been drafted to send to the provincial government requesting an exemption from their regulations should East Hants develop our own. The letter has been appended to this staff report as Appendix A. Staff are recommending that this letter be endorsed by Council.

Other Jurisdictions

Planning staff undertook a jurisdictional scan of other municipalities in Nova Scotia with a coastline.

Cumberland County

Regulations include:

To deal with coastal erosion:

- Shoreline buffers of 30.5 metres have been established. Within that buffer development is prohibited, some exceptions apply including 1 accessory building no larger than 20m².
- Existing buildings within the buffer may be replaced, reconstructed, repaired provided it does not increase the buildings footprint and it is not moved closer to the shoreline.
- Development may be built closer to the top of the bank, provided: the bank has been stabilized; and if building is a dwelling or short-term rental building cannot be closer than 20m.

To deal with coastal flooding:

- On land identified in the land use bylaw minimum building floor elevations are required - this varies based on the location from 2.6 metres on the Northumberland coast, 7.1 metres on the Minas Basin, to 8.7 metres on the Chignecto Bay.

Halifax Regional Municipality

Land Use Bylaw Regulations for properties abutting the Atlantic Coast - new dwellings must have an elevation 3.8 metres above Canadian Geodetic Vertical Datum (CGVD 28); accessory buildings (some exclusions including backyard suites) are permitted without required elevation; and expansions to existing dwellings must not reduce the existing elevations.

Town of Yarmouth

The town has regulations to protect buildings from storm surge flooding. In the Climate Change Storm Surge and Sea-level Rise Sensitive Area (overlay zone) the following regulations apply.

- They have set floor elevations of buildings for main non-water dependent and accessory non-water dependent and then also elevations for main and accessory water dependent buildings.
- Their regulations are separated out from year of construction so one elevation for the present time to 2050 and then a higher elevation for 2051-2100. This higher elevation will account for impacts from sea level rise and climate change.
- They have separation distances from the Ordinary High Water Mark.
- Minimum floor elevation for building with hazardous materials - bulk storage of these materials not permitted in the Climate Change Storm Surge and Sea Level Rise Sensitive Area.

Cape Breton Regional Municipality

Identifies in their Municipal Planning Strategy that coastal erosion is an issue but has not addressed it with policies or regulations.

District of Lunenburg - Riverport & District LUB

Could not find any regulations relating to storm surge flooding.

Municipality of the District of Guysborough

Could not find any regulations relating to storm surge flooding or coastal erosion.

Policy Discussion

There are two different hazards under discussion and each have their own impact on properties and buildings.

STORM SURGE FLOODING

With storm surge flooding, it has the potential to put people at risk and also damage buildings from flooding. The damage to buildings from the flooding could be severe, ranging from the loss of buildings through to minor impacts to buildings that could be repaired. The study was not intended to identify the level of damage from storm surge flooding but to identify the areas under risk of flooding from a 1 in 25 year potential storm surge flooding event and a 1 in 100 potential year storm surge event. The consultant identified the present day risk of flooding and then calculated the anticipated impact from climate change, including sea level rise, and used that calculate the location of flooding in 2100.

The vulnerability study provided the following data on storm surge flooding.

Condition	HHWLT ¹ (CGVD2013) ²	25 Year Storm Surge	100 Year Storm Surge	SLR ³ : 2100	Ice Sheet Melt	Total 25 Year Level (CGVD2013)	Total 100 Year Level (CGVD2013)
Present Day	7.31 m	1.01 m	1.13 m	-----	-----	8.32 m	8.44 m
2100	7.31 m	1.01 m	1.13 m	0.9 m	0.65 m	9.87 m	9.99 m

1. HHWLT - Higher High Water Large Tide

2. CGVD2013 - Canadian Geodetic Vertical Datum of 2013 which is the reference standard for heights across Canada.

3. SLR - Sea Level Rise

The above information means that based on climate change the projected flood risk was calculated to be 9.87 m for a 25 year potential storm and 9.99 m for a 100 year potential storm. These levels have been identified on a map with a line depicting the extent of the two storm surge events. As the difference in elevation between the 25 year storm surge and 100 year storm surge is small it is not easily identifiable on the maps. Although the methodology behind how the data was generated differs, the outcome on maps is similar to the floodplain lines for the Shubenacadie River.

Coastal flooding differs from fluvial (river) flooding in that the damage from a river flood can be widespread as the overflow affects smaller rivers downstream, which can cause dams and dikes to break and swamp nearby areas. With a fluvial flood a building located in the floodplain can impact properties downstream as it doesn't enable the floodwater to flow naturally. In planning staff's opinion this means that the approach to what could be permitted in the storm surge flooding area should be less restrictive than the Shubenacadie Floodplain. There is still a desire to protect people and properties but the concern about wider impacts of buildings within the floodplain is not the same as within the Shubenacadie Floodplain.

Recommended approach - Flooding overlay zone

Planning staff recommend regulations similar to the moderate risk floodplain zone whereby an overlay zone is established. The overlay zone should regulate the following:

- New main buildings are permitted in accordance with the underlying zone. The buildings are permitted with the addition of a requirement to be built with a finished floor level of at least 10.0m (CGVD2013). This is 0.1m above the projected 100 year flood event in 2100. Accessory dwelling units should also be regulated with the same minimum floor elevation.
- Existing buildings below the required finished floor elevation can be expanded provided such expansion does not further reduce the existing elevation.
- Accessory buildings which are not habitable are subject to underlying zone only.
- Residential institutions such as hospitals, senior citizen homes, homes for special care etc. where flooding could pose a significant threat to the safety of residents if evacuation became necessary not be permitted within the overlay zone.
- Any uses associated with the warehousing or the production of hazardous materials not be permitted within the overlay zone.
- Infilling is permitted

COASTAL EROSION

The mapping created by AGRG enable an understanding of where the projected coastline would be in 2050 (28 years) and 2100 (78 years). The mapping is not an exact science but it does provide a more educated understanding of how the coastline may erode over the next several years based on historical erosion which is in staff's opinion would be a reasonable indicator of how future erosion would occur without any intervention. Another option would be to identify a buffer of the same distance across the whole of the coastline with the Bay of Fundy but this won't capture where erosion is more severe or areas where erosion is minimal so planning staff does not support a 'one size fits all' approach with a consistent width buffer.

Recommended approach - Coastal Erosion setback

Planning staff recommend that a setback be established based on the projected 2100 coastline. This is just short of the 80 year horizon that the Coastal Protection Act Regulations is looking to regulate based on. Within this land use bylaw setback staff recommend that no permanent structures be permitted.

Staff recommend that where buildings are destroyed by fire or otherwise the building be permitted to be replaced but this building cannot be closer to the coastline than the existing building. If a building is destroyed by coastal erosion the owner should be able to reconstruct on the property. If the reconstructed building

cannot be constructed outside the coastal erosion setback then site plan approval should be required where the property owner need to demonstrate that the building is located as far from the coastline as possible.

Where existing main buildings are located within the setback, planning staff recommend that accessory buildings be permitted, provided the building is no closer to the coastline than the existing main building. This is not ideal to enable additional buildings in the erosion setback but it does enable owners with existing uses in the erosion setback to utilize their property. Development staff will make these property owners aware of the risk of building in this area.

Staff recommend that if a bank has been stabilized that the property owner can request a variance from the regulations through site plan approval. The property owner will need to submit a report from a qualified professional to demonstrate that the development is outside of the coastal erosion area up to 2100.

Planning staff recommend that where the mapped erosion area jumps over a provincially or municipally owned road that the edge of the road closest to the coastline be the edge of the coastal erosion setback. Staff anticipate that roads will be maintained and protected from coastal erosion and therefore properties on the landward side should be protected from erosion by this maintenance.

STRATEGIC ALIGNMENT

The 2021-2024 East Hants Strategic Plan identifies ‘Strong Community’ as one of the four areas of strategic focus. Regulations to protect properties and people from coastal erosion and coastal flooding helps to create a strong resilient community.

LEGISLATIVE AUTHORITY

The legislative authority to create planning policies and regulations relating to flooding and hazardous conditions is set out in the Municipal Government Act (MGA), Part VIII.

FINANCIAL CONSIDERATIONS

There are no financial considerations related to this report.

Public Comments

The Plan Update survey asked ‘in planning for the future of your community, how strongly should East Hants regulate land use in the following areas?’ Around 65% of the residents in ‘All East Hants’ who responded to the survey selected that shoreline development should be strongly regulated. This increased to around 70% of the respondents who responded in the future planned area supporting strong regulations on shoreline development. Around 20% of residents in the future planned area support average regulations relating to shoreline development.

Alternatives

If PAC does not support the recommended approach for regulations relating to coastal erosion and storm surge flooding staff could draft alternative regulations with direction from Council. Alternatives could include:

- The coastal erosion setback could include all of the land identified by AGRG which would include land past any provincial or municipal roads;
- In the storm surge flooding overlay area accessory buildings could also be subject to the required finished floor level.

Attachments

- Appendix A - draft letter to the Minister of Environment and Climate Change.

- Appendix B - A copy of the presentation provided by Dr. Tim Webster at the May 2022 meeting of Planning Advisory Committee.
- Appendix C - final vulnerability study