ADAPTATION OPTIONS

Coastal Flooding

This document offers different ways to adapt to coastal flooding for individuals, communities, and municipalities including planning ahead, using nature-based approaches, built infrastructure, and policies and programs. It is not intended to be comprehensive. Instead, this is a short summary of well-researched adaptation approaches that may be relevant for Atlantic Canada.

Context

- Coastal flooding typically happens when water levels rise during storms or during high tides for very low-lying areas.
- Climate change is causing sea levels to rise and is bringing more intense storms to Atlantic Canada. Coastal areas are likely to flood more frequently, low-lying areas may become permanently underwater, and sea water will reach further inland.
- Flooding can damage property, wash out roads or bridges, and put people at risk.

Planning Ahead

- **Flood maps and raising awareness**. Flood hazard maps help people understand if their home or business may flood. Maps can identify roads, critical infrastructure or neighborhoods that are most likely to be flooded. Public awareness of flood hazard areas can help individuals and communities identify the need to take action.
- **Emergency planning**. Community emergency plans need to be clearly communicated and easily accessible. Key components of an emergency response plan include the identification of roles, planned escape routes, and keeping emergency supplies on hand. Special care needs to be taken to include people often left out of preparedness processes, such as older adults, people experiencing homelessness, or persons living with disabilities.
- **Collaboration and engagement**. Engaging with others in communities offers opportunities to connect, exchange experiences, and share ideas. When considering coastal adaptation on a property, it is best to work with neighbouring properties where possible, since collaboration can increase benefits and help avoid situations where actions on one property negatively affects others.

Nature-Based Approaches

- **Coastal wetlands and vegetation**. Coastal wetlands – like salt marshes – act as sponges and buffers during a flood event, shielding the land behind from flood waters. Restoring, protecting, and expanding natural areas such as salt marshes, eelgrass beds, or oyster reefs can help reduce flooding in adjacent areas. Living shoreline techniques that use salt-tolerant, native vegetation to stabilize shorelines, can reduce flooding and erosion.
- **Dune restoration and stabilization**. Dunes act as natural barriers, buffering land behind from the impacts of waves . Planting native grasses can help hold sand in place and rebuild dunes. Preventing human disturbance of dunes is critical for them to remain as healthy buffers.

Built Infrastructure

- **Floodproofing**. "Wet" floodproofing allows water to enter a building during a flood event in ways that cause minimal damage. This approach is useful in areas like parking garages or storage areas, which would not be significantly damaged by temporary flood water. It can also be used for homes in flood prone areas. "Dry" floodproofing prevents water from entering a building during a flood, such as by building temporary flood barriers or more permanent floodwalls outside a home or building. Electrical systems or furnaces can be moved out of the lowest level of the building.
- **Raising or moving infrastructure**. Buildings can be raised so the first floor is higher than the highest potential flood water levels, such as by using stilts or by using infill to raise foundations. In some cases, existing buildings and infrastructure should be moved back from flood-prone areas.
- **Seawalls and dykes**. In some cases, using structural barriers, such as concrete seawalls or earthen dykes may be necessary. These need to be designed to include a way for inland water to drain back through to the ocean as flood waters recede. Seawalls or dykes will require ongoing upkeep as sea levels rise. They are expensive, and as sea levels rise and storms become more intense, may become too costly or impractical to maintain.

Policy and Programs

- **Land use bylaws and zoning**. Land use bylaws and zoning are tools that municipalities can use to manage, limit or prevent new construction in flood-prone areas. A similar option is to require all new construction or renovation to occur above the elevation of the floodplain, called a vertical setback. Public land in flood hazard areas can be zoned as a park or open space, which can be temporarily flooded without too much long-term damage. Bylaws and zoning can require floodproofing as part of new builds or renovations in flood-prone areas.
- **Encourage flood preparedness**. Provinces or municipalities could consider financial incentives that encourage development outside of current or future flood zones, which may include compensation packages or financial support to people who relocate out of high-risk areas. Reducing or removing building permit fees could be used to promote flood-resilient design standards and building techniques.

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