



ADAPTATION OPTIONS

Inland Flooding

This document offers different ways to adapt to inland 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

- Inland flooding is most often caused by heavy rainfall, rapid snowmelt, ice jams in rivers, or when rain falls on frozen ground that can't absorb the water. Flooding is a natural process but can be made worse through the ways we change the landscape (e.g., increasing the number of buildings in an area).
- Climate change is expected to make flooding more intense across Atlantic Canada, as sudden, intense rainfall and stronger storms become more likely through climate change.
- 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, and include the identification of roles, planned escape routes, and keeping emergency supplies on hand. People often left out of preparedness processes, such as older adults, people experiencing homelessness, or persons living with disabilities, need to be included. Using weather forecasts and other information, flow forecasting can help predict when and where flooding is likely to happen and can allow for targeted emergency responses.
- **Collaboration and engagement.** Engaging with others in communities offers opportunities to connect, exchange experiences, and share ideas. Public participation in flood preparedness, with a focus on learning and addressing the needs of those most likely to be severely affected, helps people become educated and engaged.

Nature-Based Approaches

- **Green spaces and nature-based features.** Creating and maintaining features like wetlands and natural floodplains, as well as vegetated river and stream banks will reduce flooding. Vegetated or naturalized stormwater management systems can absorb and retain rainwater to reduce runoff. Nature-based approaches range in size, cost, and amount of maintenance, and can be implemented on an individual, neighbourhood, or community scale.
- **Natural assets.** Maintaining or restoring natural assets like wetlands and forests can help ensure they effectively absorb rainfall and reduce the likelihood of flooding, in addition to providing a wide range of other benefits. Healthy natural areas can help reduce or remove the need for more expensive built infrastructure.

Built Infrastructure

- **Stormwater management.** Heavy rainfall may overwhelm existing drainage and stormwater systems. Building stormwater infrastructure like sewers, ditches, and culverts that are designed with climate change in mind will keep water away from homes and businesses.
- **Floodproofing.** Sealing doors and windows, installing sump pumps, or using flood-resistant building materials reduces the potential damage to homes and property. Electrical systems or furnaces can be moved out of the lowest level of the building.
- **Raising or moving infrastructure.** Buildings can be constructed or raised so the first floor is higher than the highest potential water levels. In some cases, existing buildings and infrastructure should be moved back from flood-prone areas.
- **Permeable surfaces.** Water runoff from sealed surfaces like pavement and concrete is quick and can be significant. Using plants and permeable surfaces where water can be absorbed will reduce the amount of runoff.

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.