

# MITIGATING FLOOD RISKS IN CANADA: A “WHOLE OF SOCIETY” APPROACH TO LIMITING COSTLY DAMAGES



Prepared for:



## Clean Air Partnership

Prepared by:

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December 3, 2020



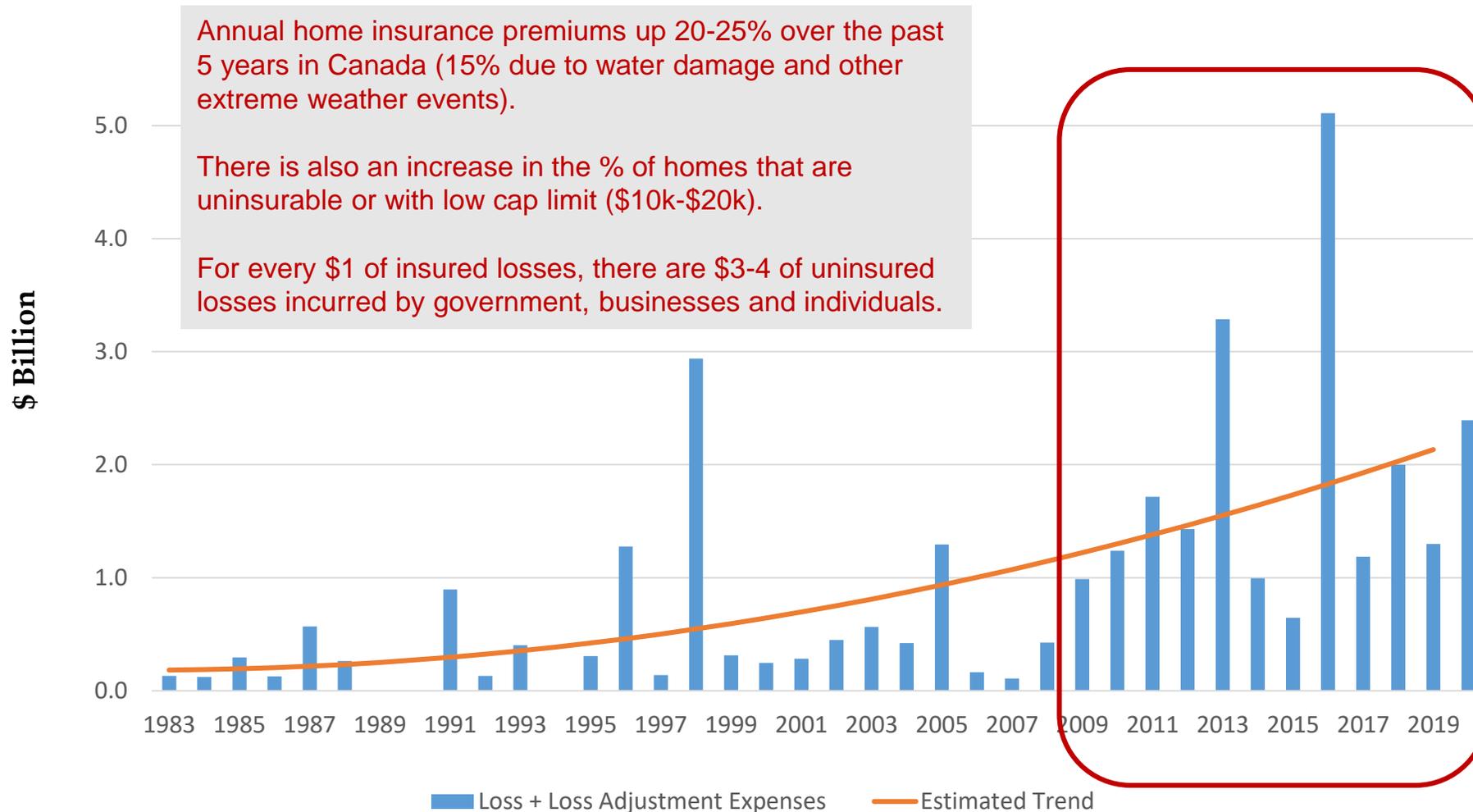
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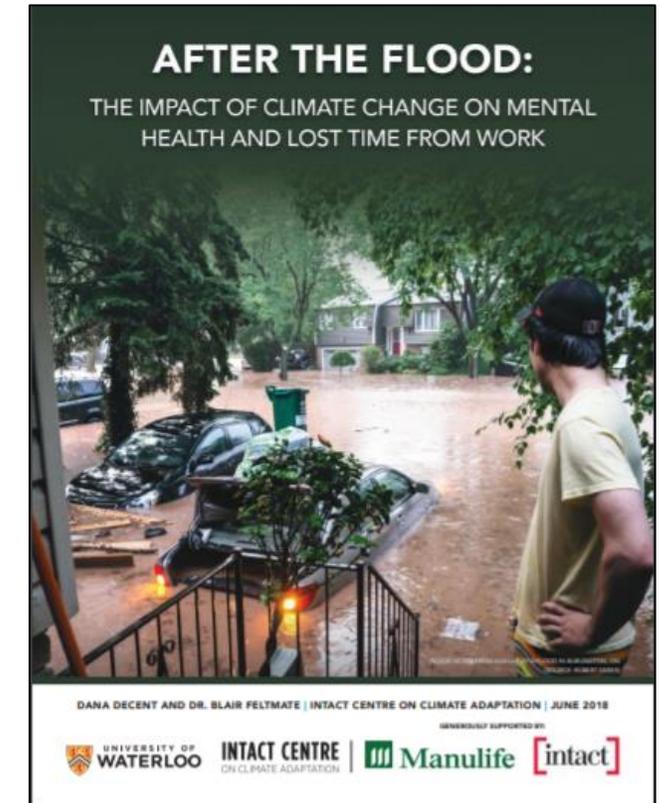
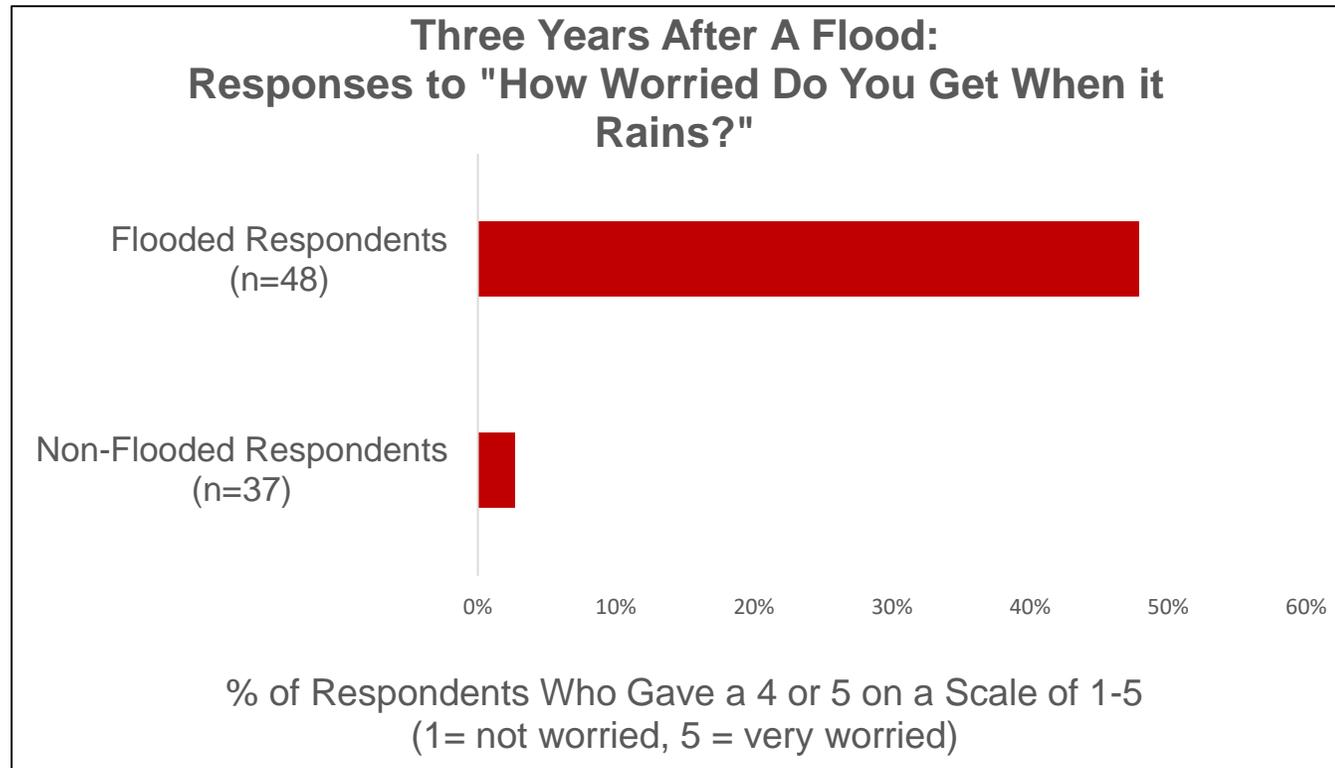
1. Climate change is real, is happening and is costly – Flooding is the “Elephant in the Room” in Canada
  - ▼ Catastrophic insurable losses are on the rise
  - ▼ Growing risk of mortgage arrears in vulnerable areas
  - ▼ Mental health and time off work impacts
3. Flood risk reduction research, guidelines and standards
4. Case studies on flood risk reduction, engaging with:
  - ▼ Homeowners and tenants
  - ▼ Insurance brokers, mortgage professionals and home inspectors
  - ▼ Commercial real estate owners and managers
5. Discussion of municipal actions to limit flood risk

# COSTS OF EXTREME WEATHER: P&C CATASTROPHIC INSURABLE LOSSES (\$CAD, 2020)



Insured catastrophic-loss payments in Canada, 1983-2020. Total losses are normalized for inflation (\$2020 CAN) and per capital wealth accumulation. November 2020. *Source: CatIQ, PCS, IBC Facts Book, Statistics Canada, IMF WEO Database.*

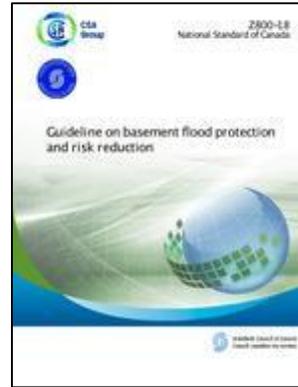
- Average time off work following basement flood: **7 days**
- Mental stress lingers (~50% of respondents worried when it rains, 3 years after a flood event)



# NATIONAL FLOOD RISK REDUCTION GUIDELINES & STANDARDS (EXAMPLES)

## Guideline on basement flood protection

>> CSA Z800



## Prioritization of flood resilience work in existing residential communities

>> CSA W210



## Flood resilient design for new residential communities

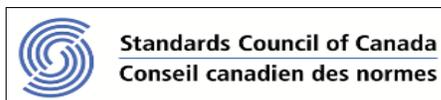
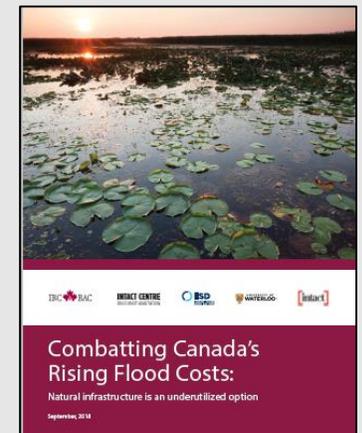
>> CSA W204



Commercial  
Real  
Estate  
Flood  
Resilience  
Guideline



Value of  
Natural  
Infra  
to Limit  
Flood \$  
Costs



**50-100 Subject Matter Experts per Guideline/Standard**

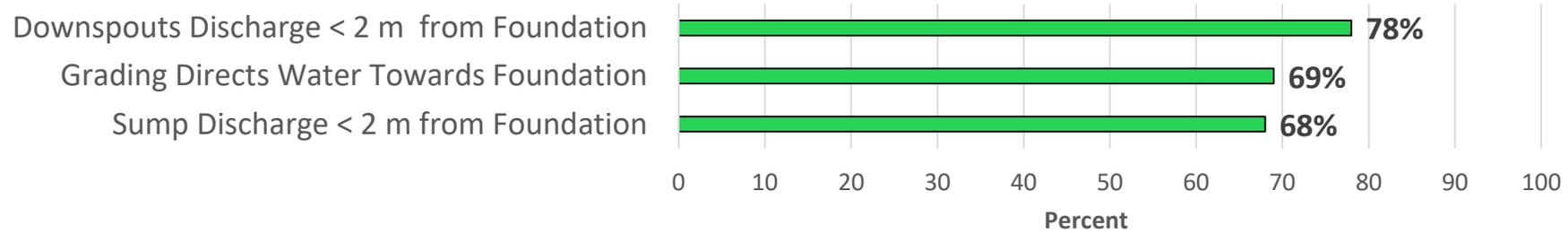


[Under One Umbrella](#) report provides a full "tool box" -- a compilation of national standards, guidelines and practical, proven ways to mitigate flood risks -- that can be used by a wide range of stakeholders in Canada.

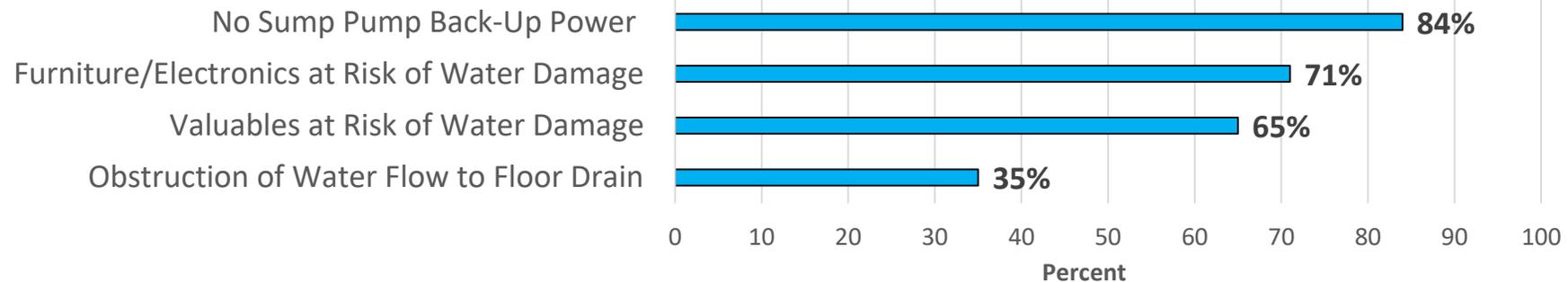
- **Homeowners and tenants;**
- **Governments at all levels;**
- **Owners and managers of commercial buildings;**
- **Professionals involved in buying, selling or insuring property** -- including insurance brokers, mortgage brokers, real estate agents and home inspectors;
- **Regional conservation agencies and ENGOS** (Environmental Non-Government Organizations); and
- **Institutional investors**, such as pension funds, REITs, investment advisors, endowments, and mutual funds.

# KEY FACTORS THAT AFFECT BASEMENT FLOOD RISK

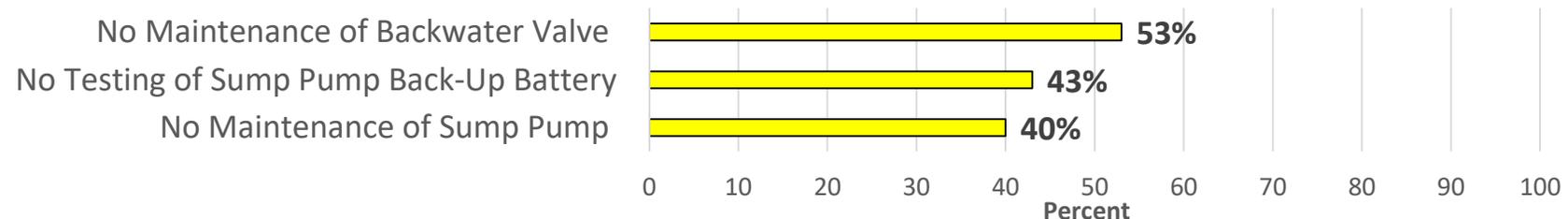
## Top Flood Risks Recorded Outside the Home



## Top Flood Risks Recorded Inside the Home



## Top Self-Reported Maintenance Flood Risks Inside the Home





### Step 1: Maintain What You've Got at Least Twice per Year

<b>Do-It-Yourself for \$0</b>	<p>Remove Debris from Nearest Storm Drain</p>	<p>Clean Out Eaves Troughs</p>	<p>Maintain Plumbing, Fixtures and Appliances</p>	<p>Test Your Sump Pump</p>	<p>Clean Out Your Backwater Valve</p>
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### Step 2: Complete Simple Upgrades

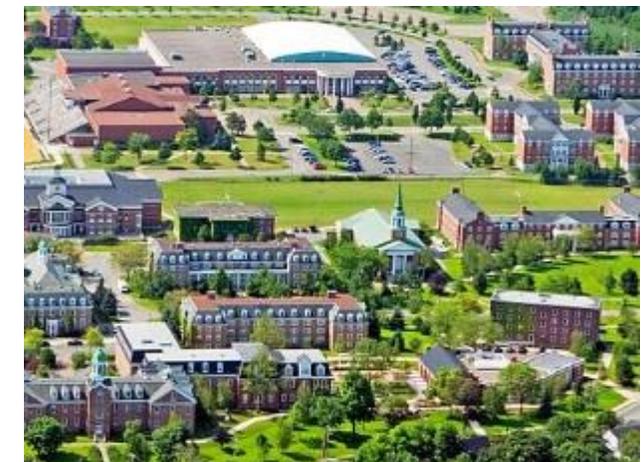
<b>Do-It-Yourself for Under \$250</b>	<p>Install Window Well Covers</p>	<p>Extend Downspouts and Sump Discharge Pipes at Least 2m from Foundation</p>	<p>Store Valuables and Hazardous Materials in Watertight Containers or Remove from Basement</p>	<p>Remove Obstructions to Basement Floor Drain</p>	<p>Install and Maintain Flood Alarms</p>
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### Step 3: Complete More Complex Upgrades

<b>Work with a Contractor for Over \$250</b>	<p>Install Window Wells that Sit 10-15 cm Above Ground and Upgrade to Water Resistant Windows</p>	<p>Disconnect Downspouts, Cap Foundation Drains and Extend Downspouts to Direct Water at Least 2m from Foundation</p>	<p>Correct Grading to Direct Water at Least 2m Away from Foundation</p>	<p>Install Backwater Valve</p>	<p>Install Backup Sump Pump and Battery</p>
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# CASE STUDY 1: HOME FLOOD PROTECTION CAMPAIGN IN NOVA SCOTIA

- In June 2020, Antigonish County, the Town of Antigonish, and the Paqtnkek Mi'kmaw Nation in Nova Scotia collaborated to launch a coordinated, region-wide distribution of the infographic [Three Steps to Cost-Effective Home Flood Protection](#).
- More than 25,000 residents received the information through a combination of [property tax bill inserts](#), newsletters from councillors, posters in community centres, and hand-delivered flyers.
- The partners have found that residents are more likely to read the page of information -- rather than dismiss it as junk mail -- if it is distributed as part of the property tax mailing, and if it shows the logos of all the parties or businesses involved.
- Antigonish County, the Town of Antigonish and Paqtnkek Mi'kmaw Nation have set an example that can be followed by other governments in Canada, as well as local utility companies, conservation authorities, neighbourhood associations and community groups.



## CASE STUDY 2: PROFESSIONAL TRAINING ON FLOOD RISK REDUCTION

**Two (2)** courses available on home flood protection in Canada:

**A 14-week** online [Home Flood Risk Assessment Training Course](#) for home and property inspectors; insurance brokers and adjusters; mortgage professionals; engineers and planners; emergency managers and first responders; real estate brokers and agents; landscapers and home builders and renovators offered through Fleming College.

**A 1.5 hour** training course for members of the following industry associations:



**Insurance Brokers Association of Canada (IBAC):** A national association representing more than 38,000 property and casualty (P&C) insurance brokers to advocate for the best interests of brokers and consumers.



**Mortgage Professionals Canada (MPC):** A national mortgage industry association representing 12,000 individuals and 1,000 companies, including mortgage brokerages, lenders, insurers and industry service providers.



**Canadian Association of Home & Property Inspectors (CAHPI):** A national association that represents more than 500 professionals and whose mission is to promote and develop the home-inspection profession.



**Carson Dunlop:** An international inspection and training company that offers inspectors education, report-writing solutions, and successful inspection concepts. It represents more than 1,500 professionals in Canada.

## CASE STUDY 3: RECOGNIZING THE VALUE OF NATURE FOR FLOOD ATTENUATION

**Natural infrastructure** plays a role in climate resilience, and much of their financial contribution for flood attenuation can be quantified.

**Natural infrastructure** offers additional environmental and social benefits that are often not attained through the use of only traditional, grey infrastructure solutions:

- Biodiversity and habitat protection;
- Carbon storage and sequestration;
- Improved water and air quality;
- A reduced “heat island” effect; and
- Aesthetic, cultural, recreational and health benefits.

Governments at all levels, conservation and watershed authorities, nongovernment organizations and others working “on the ground” to protect environmentally sensitive lands should be aware that methods exist to **calculate the economic value of natural infrastructure assets**. These stakeholders should develop and maintain **inventories** of natural features (including their condition), **assess the services and benefits** that they provide (including stormwater management and flood risk-reduction) and include them in their overall **asset-management** plans, alongside traditional grey infrastructure.



## DISCUSSION: EXAMPLES OF MUNICIPAL ACTIONS TO LIMIT FLOOD RISK

- Adopt nationally recognized best practices for flood-resilience in the official plans; urban-planning policies; zoning bylaws; climate-adaptation plans; engineering design standards and SWM guidelines (e.g., [CSA Z800](#), [CSA 204](#) and CSA W210).
- Distribute flood protection information to homeowners (e.g., the [Three Steps Infographic](#)) and businesses (e.g., [Ahead of the Storm](#) report) via property tax mailings and online channels (emails, newsletters, and social media).
- [Train](#) municipal staff and local professionals on best practices for flood protection.
- Assess and disclose the economic value of natural assets (e.g., wetlands, forests, ponds, coastal marshes) for flood protection, utilizing [MNAI](#) approach.
- Incorporate flood resilience measures into government asset-management plans and long-term financial planning.
- Ensure that flood forecasting and warning systems are in place and provide sufficient time to deploy flood-protection measures in case of a flood emergency.

