Wildfire-Ready: Empowering our Communities to Reduce Wildfire Risk

2024 Indigenous Public Safety Conference
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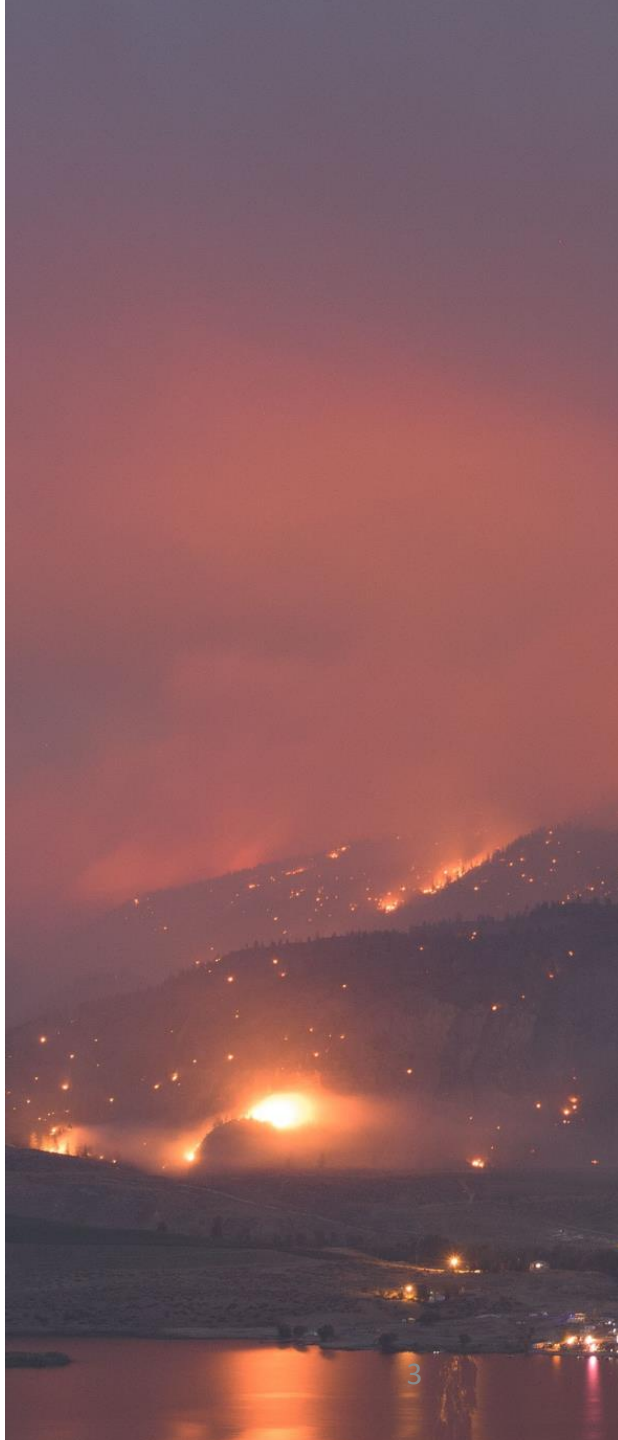
INTACT CENTRE ON CLIMATE ADAPTATION

intact

Source: Alan Westhaver, Fort Mac, 2016

Outline

1. Climate change is irreversible, severe weather is increasing
2. Financial costs of extreme weather are going up
3. Extreme Weather: Wildfire, Wildfire Smoke, Extreme Heat and Flooding
4. Disproportionate Impacts on Indigenous Communities
5. Canada's National Adaptation Strategy
6. Wildfire-Ready: Free Practical Guidance
7. Key takeaways



About the Intact Centre

Applied research institute with national focus

Easy to follow, actionable guidance

Whole-of-society approach

Address climate adaptation

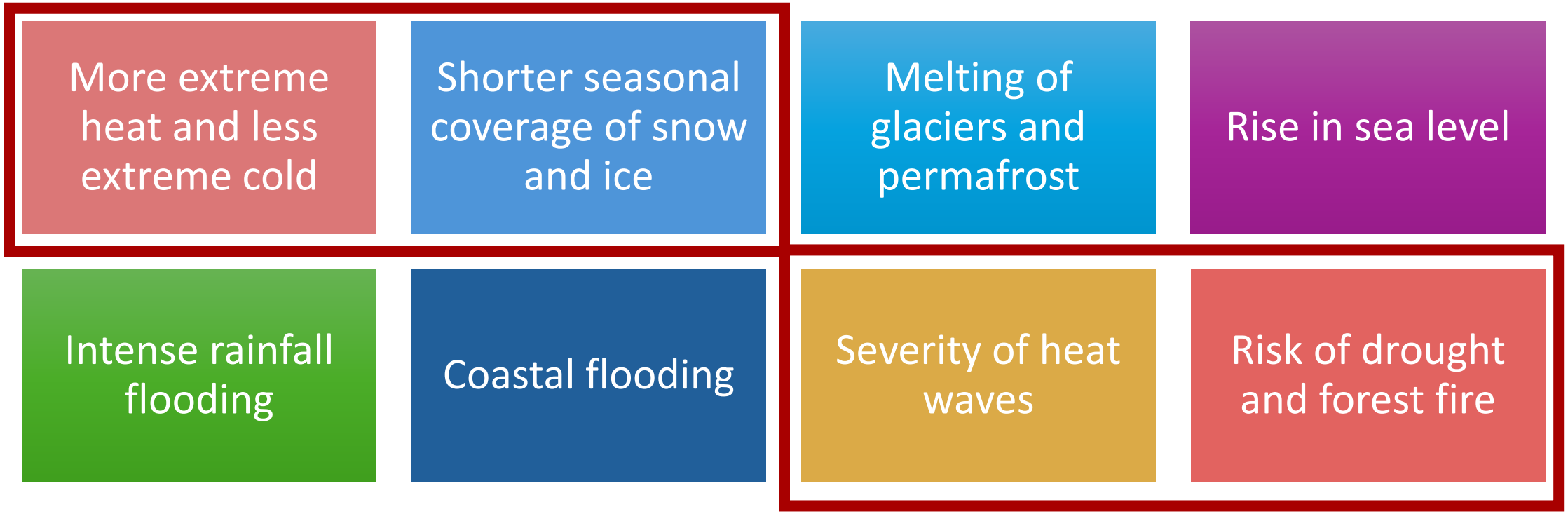
Focus on knowledge mobilization

Climate change is an irreversible threat: severe weather will increase

1. Climate change is making Canada warmer. Over the past 60 years, our climate has already **warmed by almost 2°C and will continue to warm**, because of human actions.
2. Both past and future warming is on average **about double** the magnitude of global warming, and **3 times more over northern Canada**.
3. Warming is **effectively irreversible**, even if we reduce emissions, we cannot stop it, only reduce it.

➡ This has led to an **increase in the frequency, intensity and duration of extreme weather events** and this will continue to the end of this century.

Climate Change Impacts in Canada

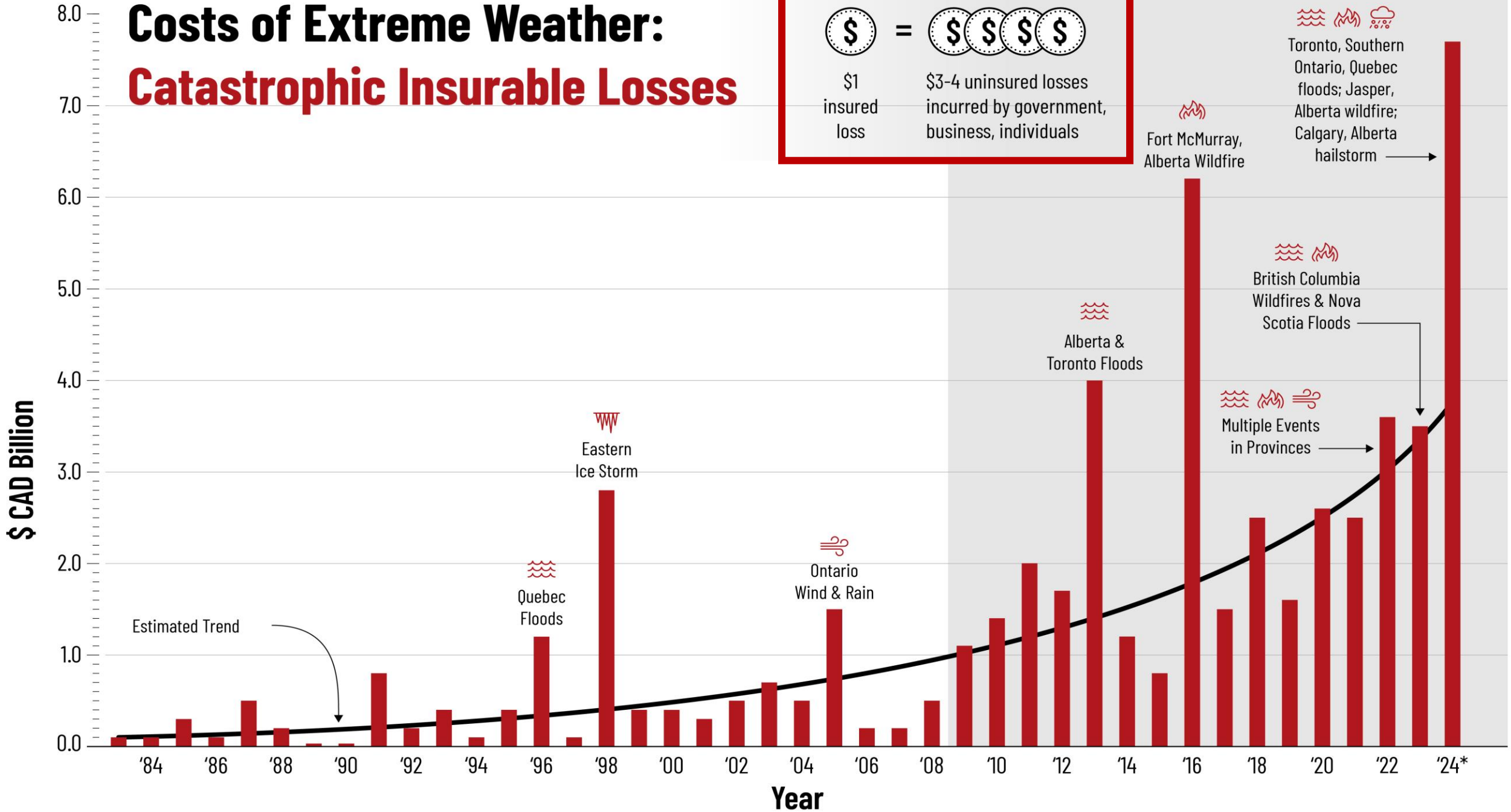


Costs of Extreme Weather:
Catastrophic Insurable Losses

$ = $$$$

$1 insured loss

$3-4 uninsured losses incurred by government, business, individuals



Source: IBC Facts Book, PCS, CatIQ, Swiss Re, Munich Re & Deloitte

*2024 preliminary values in 2024$ CAD, corrected for inflation and per capita wealth accumulation.

Wildfire

Wildfires play a natural role in maintaining the health of Canada's forests and grasslands by releasing nutrients, increasing sunlight, and aiding seed dispersal.

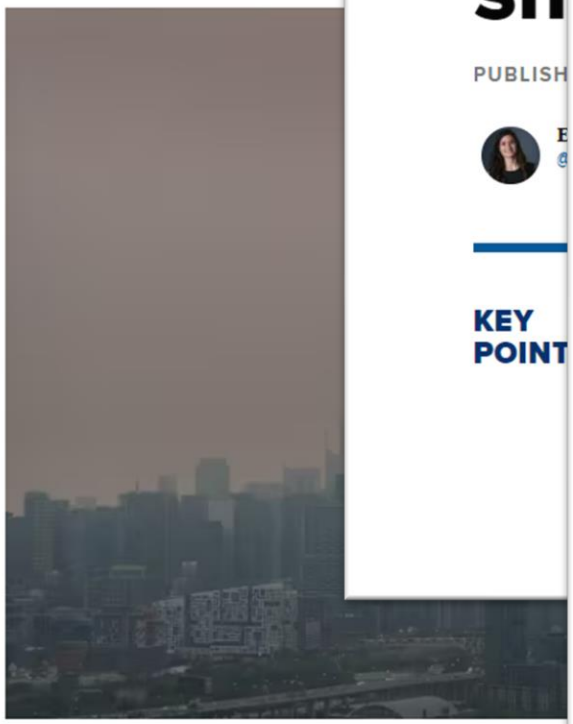
About12.3% of the population lives in the WUI, including **32.1% of the on-reserve Indigenous population.**

Wildfire **risk is on the rise** due to population growth, lack of building codes, decades of fire suppression and climate change.

Forest fire smoke envelops Toronto, bringing poor air quality, pollution

Special weather statem

CBC News · Posted: Jun 07, 20



Smog lingers over Toronto at sunrise on Wednes
increased the risk level for Toronto's Wednesday air quality alert, compared to the day before. (Patrick Morrell/CBC News)

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KEY
POINT

Toxic smoke from Canadian wildfires could impact health of millions in the US

Tiny particles from the smoke can be inhaled and damage the lungs, experts said.

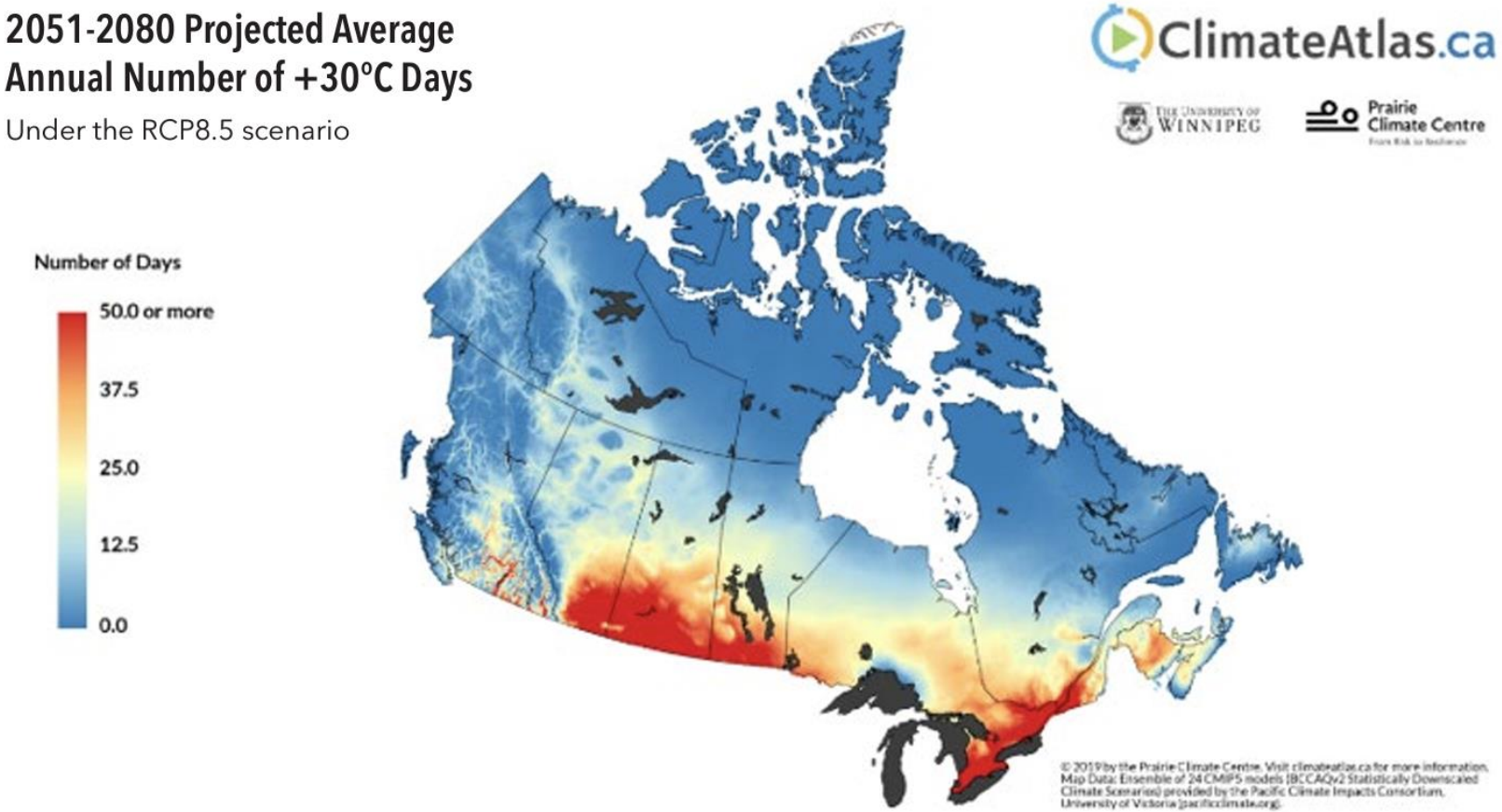
By Mary Kekatos
July 17, 2023, 9:40 AM

Disproportionate Wildfire Impacts on Indigenous Communities

- First Nations communities account for **42% of wildfire evacuations** but only **5% of Canada's population**.
- In July 2023, **106 wildfires affected 93 First Nations**, leading to **64 evacuations** and impacting nearly **25,000 people**.
- Indigenous communities face **disproportionate mental and physical health impacts from wildfires**, with studies showing higher cardiorespiratory effects from wildfire smoke.
- Recovery phases for First Nations evacuees often **lack traditional activities and mental health resources**.

Public Health Agency of Canada. (2024). *Rapid review: An intersectional analysis of the disproportionate health impacts of wildfires on diverse populations and communities.*

Extreme Heat in Canada



Extreme Heat: The Silent Killer

Extreme Heat is the Silent Killer because it gradually makes people sick and can even lead to death. It is not obvious like flooding or wildfire, that can destroy buildings and infrastructure.

The **deadliest weather event in Canada** to date was the 2021 Heat Dome in British Columbia, which tragically **resulted in 619 heat-related deaths**, highlighting the severity of extreme heat events.

Other notable extreme heat events in Canada include the **Quebec Heatwave in 2010**, which led to approximately **280 fatalities**, and the **British Columbia Heatwave in 2009**, resulting in the **loss of 156 lives**, underscoring the **recurring threat posed by extreme heat** across the country.

Disproportionate Extreme Heat Impacts on Indigenous Communities

- Indigenous communities face **higher rates of chronic health conditions**, like cardiovascular disease and diabetes, which **increase vulnerability** to heat-related illnesses.
- Poor housing conditions and overcrowding **raise the risk of heat-related health problems**.
- Extreme heat **disrupts** traditional food sources, threatening food security and cultural practices.
- Traditional activities and ceremonies are **impacted by extreme heat**, affecting cultural and spiritual well-being.

Reed t al. (2023). For our Future: Indigenous Resilience Report.
Yumagulova et al. (2023). Community is the Solution. Canadian Climate Institute.

Flooding Post Wildfire

British Columbia (2021)

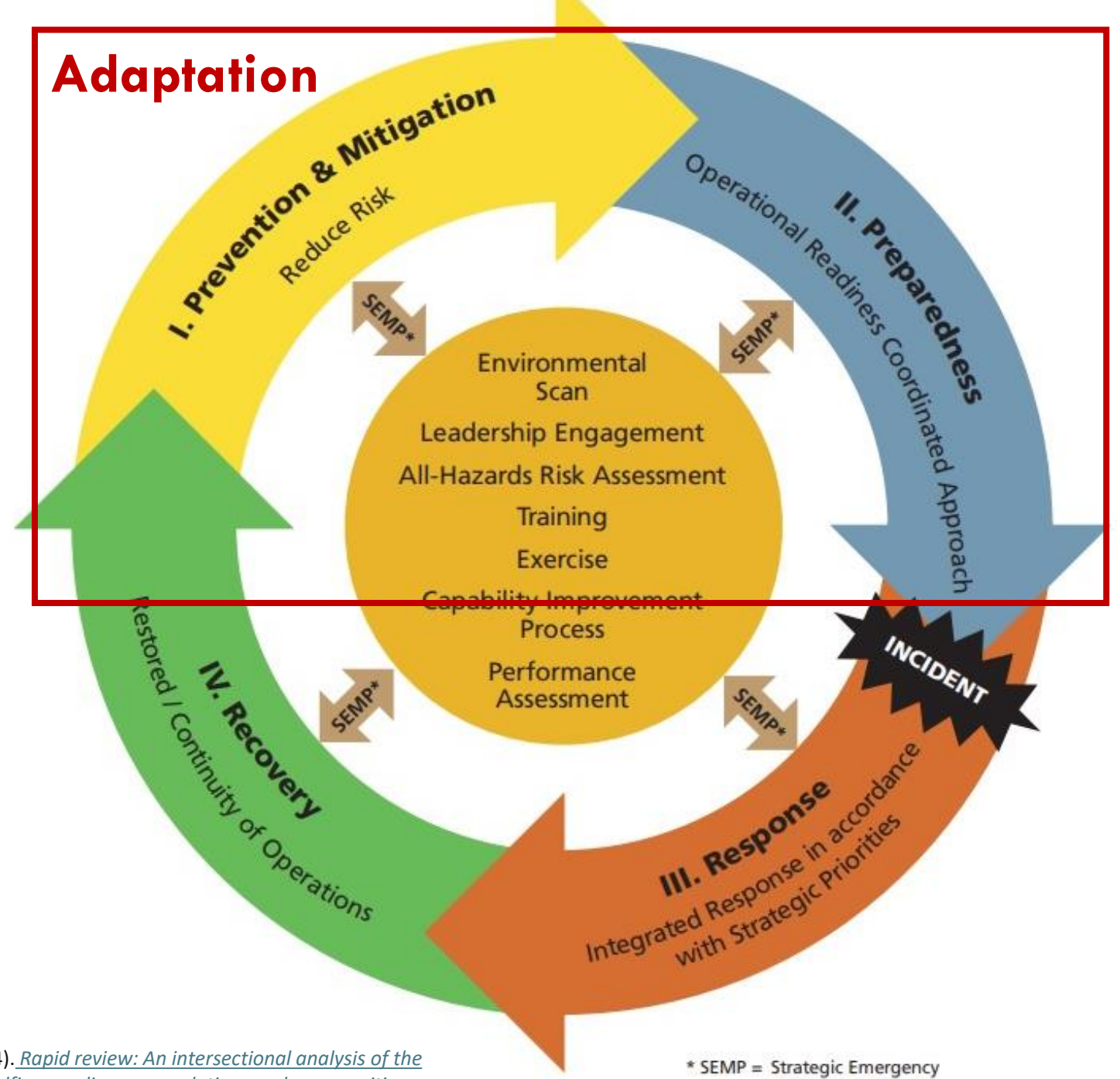
- **Lytton Creek Wildfire**
  - Severely impacted several First Nations communities.
  - Heavy rains after the wildfire caused flooding and landslides, particularly affecting the Nicomen First Nation.
  - Led to multiple evacuations and increased landslide risks due to destabilized soil.
- **Highway 8 Communities**
  - Indigenous communities, like the Shackan Indian Band, experienced catastrophic flooding following wildfire damage.
  - Flooding destroyed homes and infrastructure, forcing evacuations.

Northwestern Ontario (2021-2022)

- Wildfires occurred in the summer of 2021.
- Abnormal spring rainfall in 2022 caused widespread flooding around Rainy Lake, near the Minnesota border.

That was the bad news,
now for the **good** news

The Preparedness Side of Emergency Management



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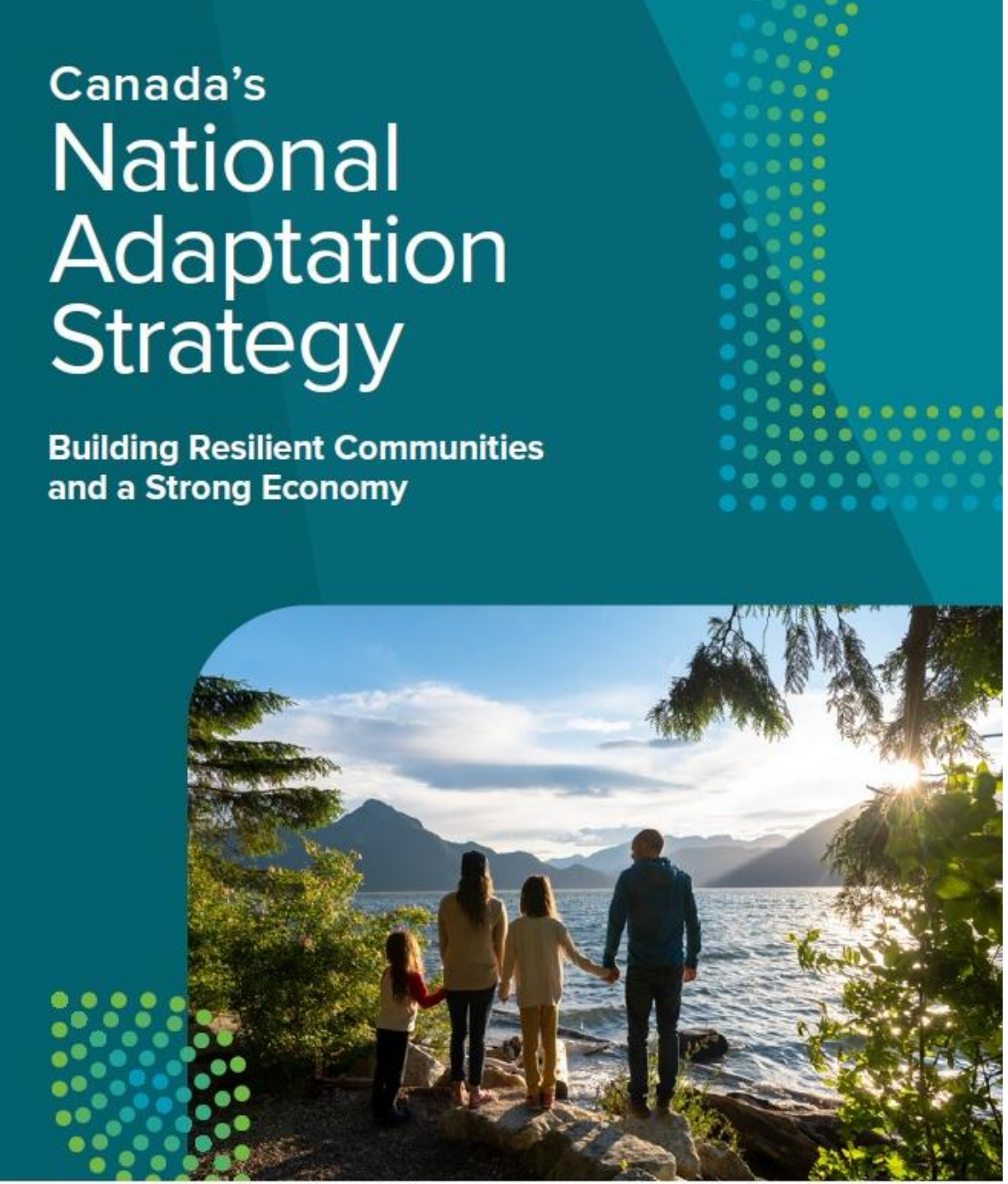
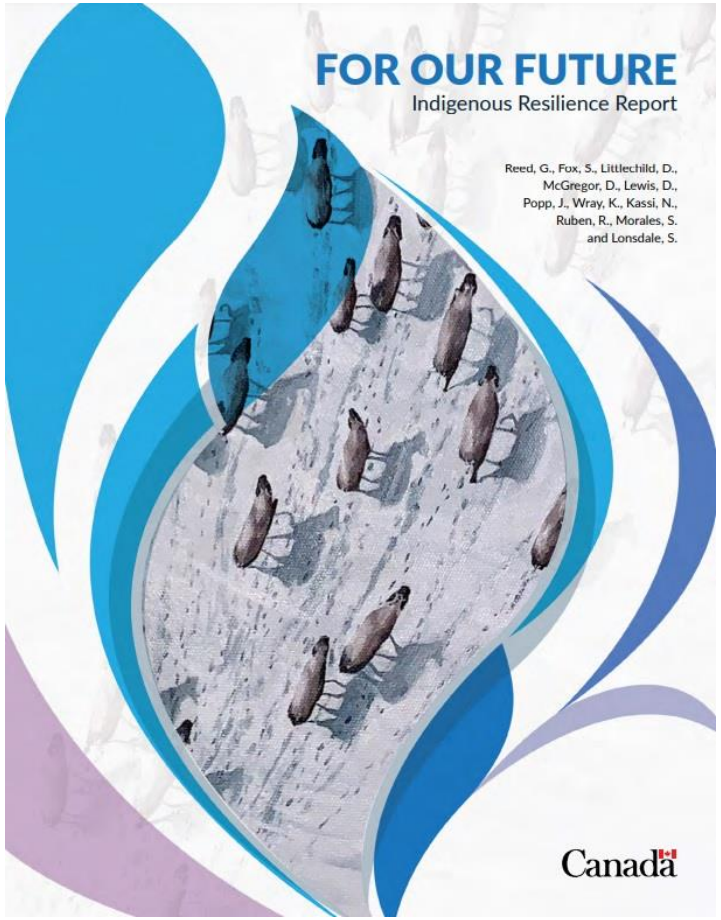


National Adaptation Strategy

The National Adaptation Strategy outlines a shared path to a more **climate-resilient Canada**. Targets include:

- **Risk Awareness** – By 2025, 60% of Canadians, including northerners and Indigenous Peoples, are aware of the disaster risks facing their household
- **Preventative Action** – By 2025, 50% of Canadians have taken concrete actions to better prepare for and respond to climate change risks facing their household.
- **Community Protection Plans**- Communities, including northern and **Indigenous communities**, in zones of high risk, as identified by provinces and territories, develop **wildfire community prevention and mitigation plans** by 2030, with up to 15% implemented by 2028.

For Our Future: Indigenous Resilience Report



- First detailed report that **shares the views and experiences of First Nations, Inuit, and Métis people on how climate change is affecting them** in Canada.
- The report aims to recognize and highlight **Indigenous Knowledge, rights, expertise**, and the challenges they face because of climate change.
- The report is meant to be used for research, policy-making, and for Indigenous communities themselves.

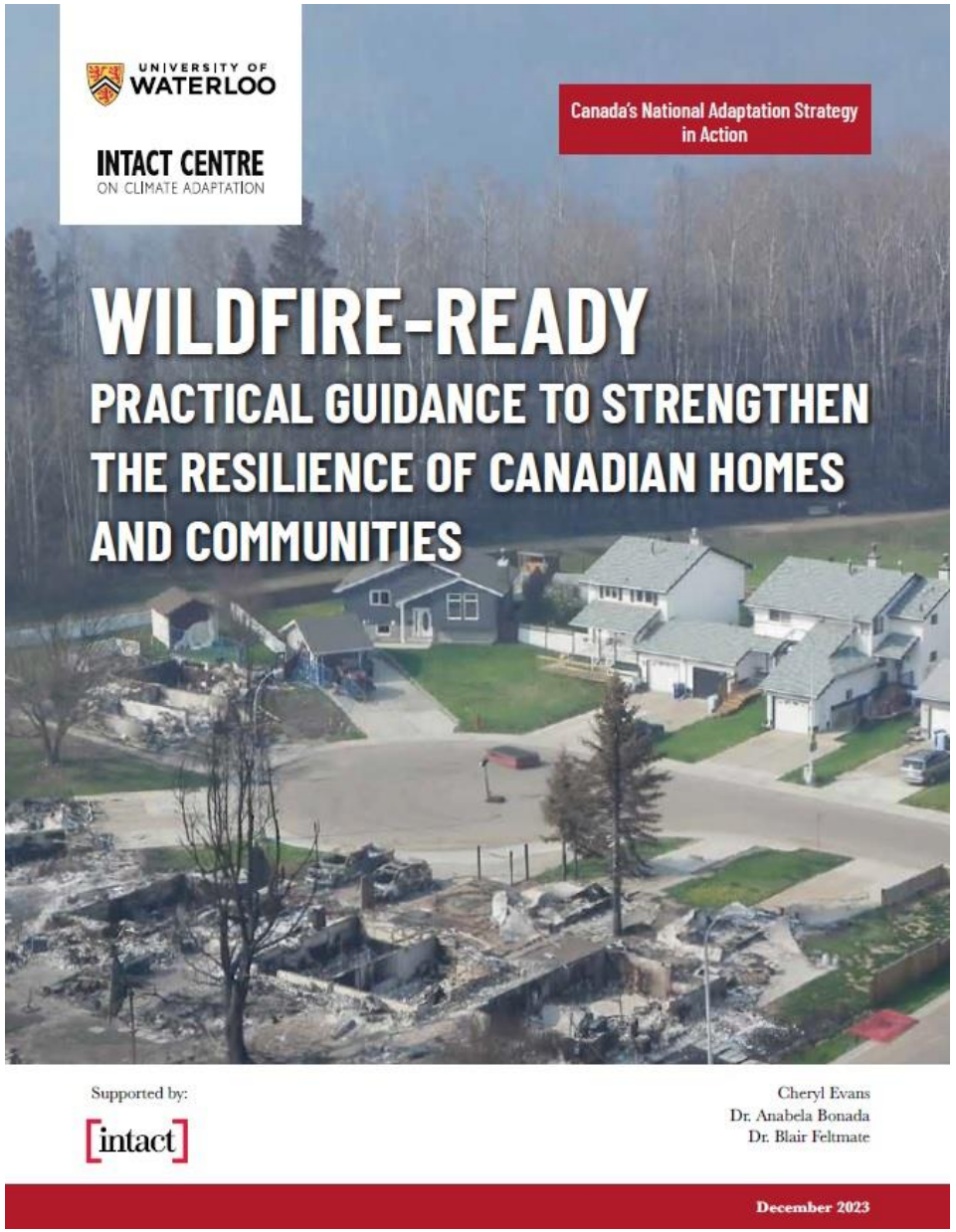
Reed, G., Fox, S., Littlechild, D., McGregor, D., Lewis, D., Popp, J., Wray, K., Kassi, N., Ruben, R., Morales, S. and Lonsdale, S. (2024). For Our Future: Indigenous Resilience Report. Ottawa, Ontario. https://changingclimate.ca/site/assets/uploads/sites/7/2024/03/Indigenous-Resilience-Report_Final_EN.pdf

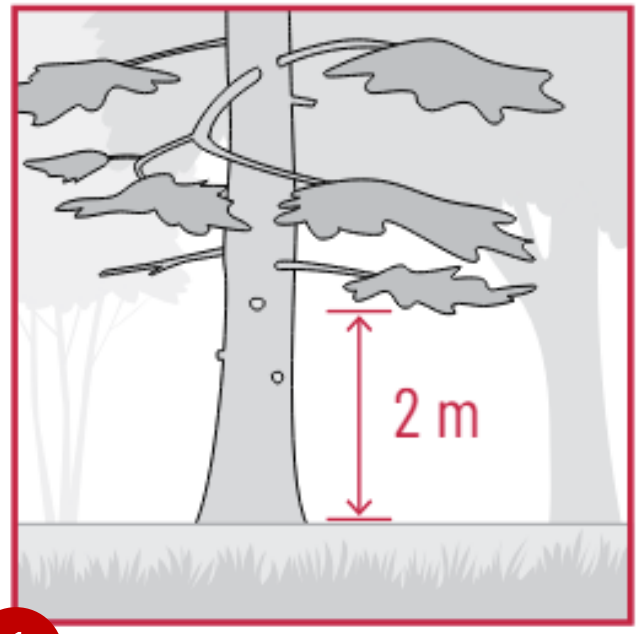
Wildfire-Ready

Developed using:

- The National Research Council's Wildland-Urban Interface Guide
- FireSmart Canada best practices

- ✓ **User-friendly and easy to read**
- ✓ **Brief and concise**
- ✓ **Adopts a whole-of-society approach**
- ✓ **Includes a clear call to action**





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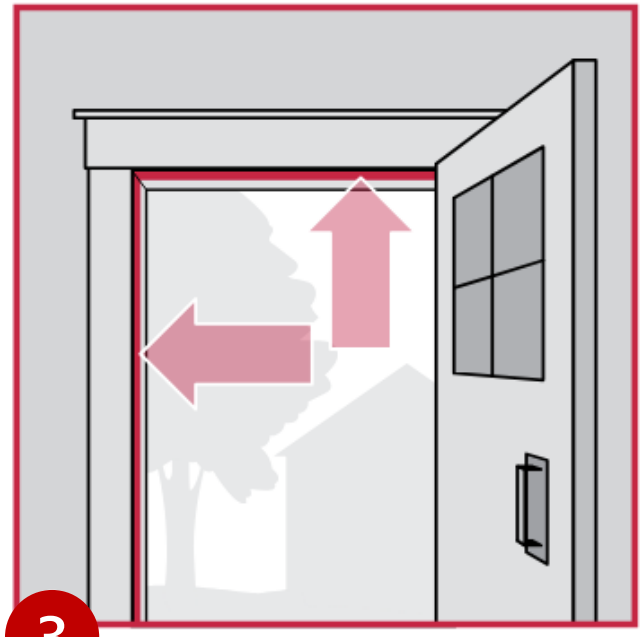


3

Reducing Wildfire Risk at Home

1. **Prune trees:** Remove lower branches from trees to create a 2 m clearance from the ground to the lowest tree branches. This will prevent wildfire from spreading

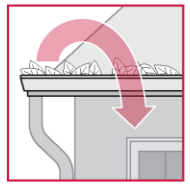
2. **Remove combustible material within 1.5 m from the home**: Remove all combustible ground cover (mulch and plants) within 1.5 m of the house perimeter.

3. **Weatherstripping:** Replace worn or missing weather stripping on all doors including garage doors. Add window screens to block heat and reduce the chance of embers getting into the home. *This will also help with wildfire smoke and extreme heat*.

THREE STEPS TO A COST-EFFECTIVE FIRESMART™ HOME

Step 1: Maintain what you've got at least twice per year

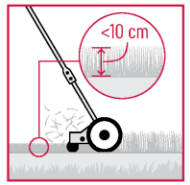
Do-it-yourself, $0 - $300



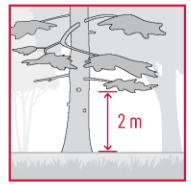
1. Remove needles, leaves and other debris from gutters, roof surfaces, decks and balconies. Regularly clean vents.

2. Remove all combustible ground cover (mulch and plants) within 1.5 m of the house perimeter.

3. Remove combustible materials (firewood and lumber) stored within 10 m of house perimeter and under decks.



4. Mow the lawn to <10 cm and plant low-growing, well-spaced shrubs and other fire-resistant plants.

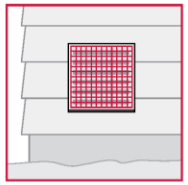


5. Prune trees to create a 2 m clearance from the ground to the lowest tree branches.

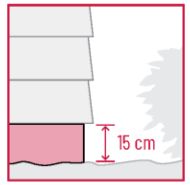
Step 2: Complete simple upgrades

$300 - $3,000

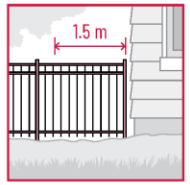
1. Replace worn or missing weather stripping on all doors including garage doors.



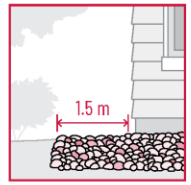
2. Add a non-combustible 3 mm screen to all external vents, except dryer vents.



3. Create a 15 cm ground-to-siding non-combustible clearance (e.g., install cement board or metal skirting).



4. Install non-combustible fencing within 1.5 m of the house (cement fiber, metal, chain link or stone).

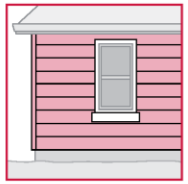


5. Install non-combustible ground surfaces within 1.5 m of the house (mineral soil, rock, concrete or stone).

Step 3: Complete more complex upgrades

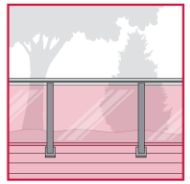
Work with a contractor, $3,000 - $30,000

1. Install Class A fire-resistant roof covering (e.g., cement fibre, metal or asphalt shingles).



2. Install non-combustible siding (stucco, metal, stone, cement fibre board).

3. Install multi-pane or tempered glass windows and exterior fire rated doors.



4. Retrofit all deck components to be fire-rated, with a continuous surface.

5. Remove conifer trees that are within 10 m of the house.

Note: not all actions will be applicable to each home. Completing these steps does not guarantee the prevention of fire.

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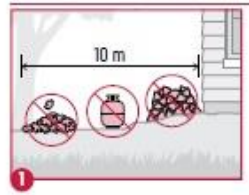
FireSmart™ Canada

Scan the code or click the link for additional resources at www.intactcentre.ca

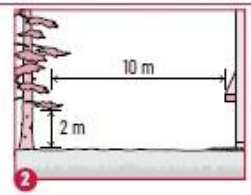
THREE FEATURES OF A WILDFIRE-READY COMMUNITY

Communities can integrate wildfire-ready features into their risk management plans to limit damage and disruption due to wildfire events and strengthen emergency preparedness. By working with Provincial/Territorial wildfire agencies and municipal/structural fire departments, communities can access available tools, training, and resources to help them assess their unique risks, and create customized action plans.

Feature 1: Wildfire-Ready Structures & Infrastructure

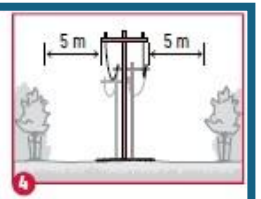


1. Complete regular maintenance of structures, infrastructure, and landscaping within 10 m to limit accumulation of flammable materials (e.g., leaves, brush piles, stored items, fuel tanks).



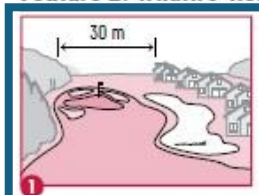
2. Install/replace landscaping with fire resistant materials within 10 m of structures and infrastructure.

3. Build/update structures and infrastructure using fire resistant building materials (e.g., Class A roofing/metal roofs, non-combustible siding, metal, or concrete hydro poles).

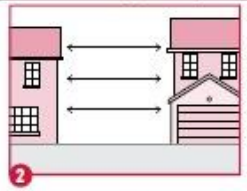


4. Design/update structures and infrastructure to be ignition resistant (e.g., 5 m distance between vegetation and power lines, power supply lines below ground where feasible).

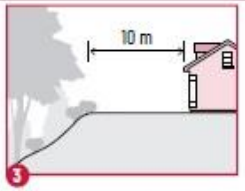
Feature 2: Wildfire-Ready Community Design



1. Integrate minimum 30 m wide zones (fire breaks) featuring ignition resistant materials (e.g., mowed grasses, ponds, roads) into community design to limit the spread of fire. Increase minimum to 50 m on steep slopes.



2. Provide greater spatial separation between structures in hazard areas to limit the spread of fire from one structure to another.



3. Require minimum 10 m setback from the crest of a hill to limit spread of fire to structures.

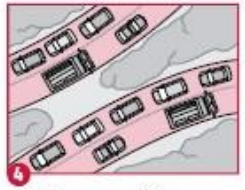
4. Restrict development in hazard areas where mitigation measures cannot meet minimum standards for health, safety, and environmental protection.

Feature 3: Wildfire-Ready Emergency Response

1. Complete annual emergency planning and cross-training exercises that include multiple agencies (e.g., wildland and structural firefighters).

2. Designate at least one emergency shelter per community.

3. Ensure minimum water supply for firefighting.



4. Provide two or more suitably sized access and egress routes to accommodate the movement of emergency vehicles.

Note: The guidance in this document is voluntary. Completion of actions should not conflict with applicable building and fire codes. Wildfire-ready communities can reduce but not eliminate risk.

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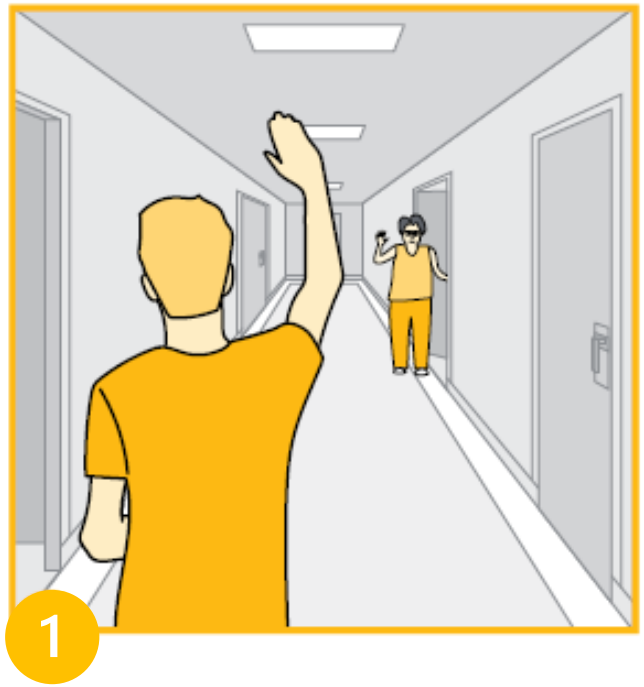
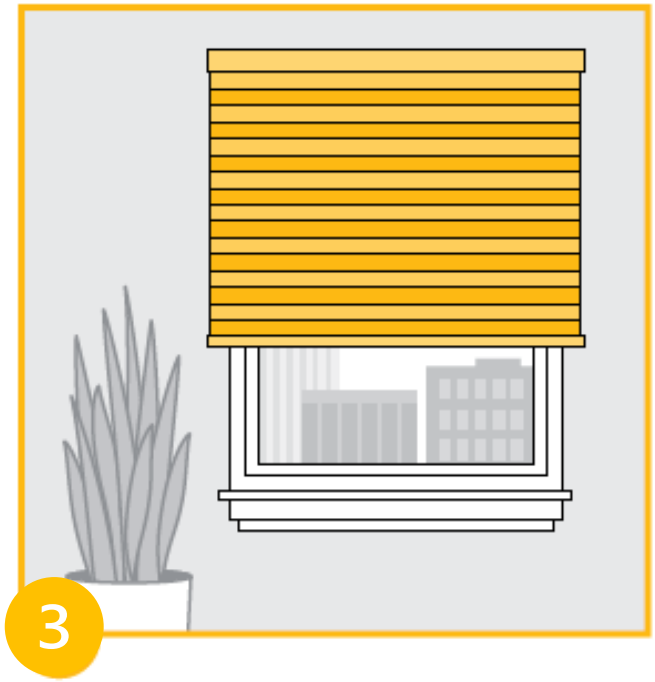




Reduce Extreme Heat in Homes

1. **Check on the vulnerable:** Help vulnerable neighbours, family, friends in preparing for heat events and arrange to check on them during extreme heat.
2. **Stay alert**: Sign up for heat alerts on your phone through apps like WeatherCan.
3. **Improve home cooling**: Install blinds, heat-resistant curtains, or films on windows.

THREE STEPS TO COST-EFFECTIVE

HOME HEAT PROTECTION

Step 1: Plan ahead to keep cool

Do-it-yourself, $0

1 Help vulnerable neighbours, family, friends prepare and arrange to check on them during heat events.

2 Sign up for heat alerts on your phone (e.g., WeatherCan).

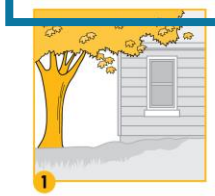
3 Learn how to best use windows and doors to naturally ventilate your home, particularly at night.

4 Choose energy efficient lights and appliances that produce less "waste" heat.

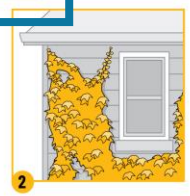
5 Temporarily arrange to work or sleep in cooler rooms (e.g. basement).

Step 2: Complete simple upgrades

Do-it-yourself, for under $250



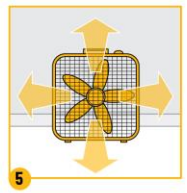
1 Plant and maintain shade trees, especially along south, east and west facing walls.*



2 Grow plants climbing up your walls, and on decks and balconies.*

3 Improve home insulation and air tightness (e.g., draft strips).

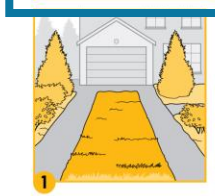
4 Install blinds, heat-resistant curtains, or films on windows.



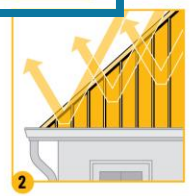
5 Use portable or ceiling fans that increase air circulation.

Step 3: Complete more complex upgrades

Work with a contractor, for over $250



1 Convert paved areas to vegetation which absorbs less heat and more water.*



2 Install a green (vegetated) or reflective roof.*

3 Shade windows with outdoor shutters and awnings.

4 Install windows and doors that have a low Solar Heat Gain Coefficient (let less heat in).

5 Install and maintain a heat pump or air conditioning unit.

* Seek local advice on appropriate native species, and, in places at risk of wildfire, consider FireSmart™ guidance.

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THREE STEPS TO COST-EFFECTIVE

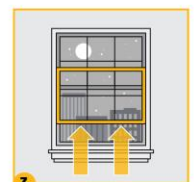
TENANT HEAT PROTECTION

Step 1: Plan ahead to keep cool

Do-it-yourself, $0

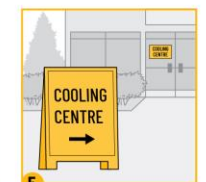
1 Help vulnerable neighbours, family, friends prepare and arrange to check on them during heat events.

2 Sign up for heat alerts on your phone (e.g., WeatherCan).



3 Learn how to best use windows and doors to naturally ventilate your unit, particularly at night.

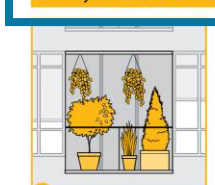
4 Choose energy efficient lights and appliances that produce less "waste" heat.



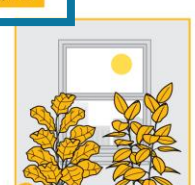
5 Arrange to work or sleep in a cooler place (e.g., shared cooling space).

Step 2: Complete simple upgrades

Do-it-yourself, for under $250

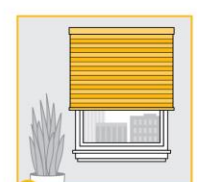


1 Green your balcony or deck with potted, hanging and climbing plants.*

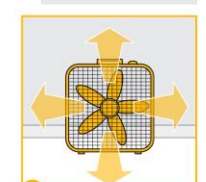


2 Place tall plants with large leaves near light-facing windows.

3 Improve unit insulation and air tightness (e.g., draft strips).



4 Install blinds, heat-resistant curtains, or films on windows.

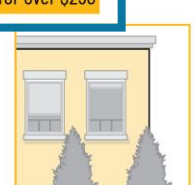


5 Use portable or ceiling fans that increase air circulation.

Step 3: Complete more complex upgrades

With building managers, for over $250

1 Install temperature and humidity monitors or controls.



2 Paint unit walls with white paint or light colours.

3 Shade windows with outdoor shutters and awnings.

4 Install windows and doors with low Solar Heat Gain Coefficients, that let less heat in.

5 Install and maintain a heat pump or air conditioning unit.

* In places at risk of wildfire, the use of green infrastructure must be considered alongside FireSmart™ guidance.

INTACT CENTRE ON CLIMATE ADAPTATION

Scan the code or click the link for additional resources at www.intactcentre.ca

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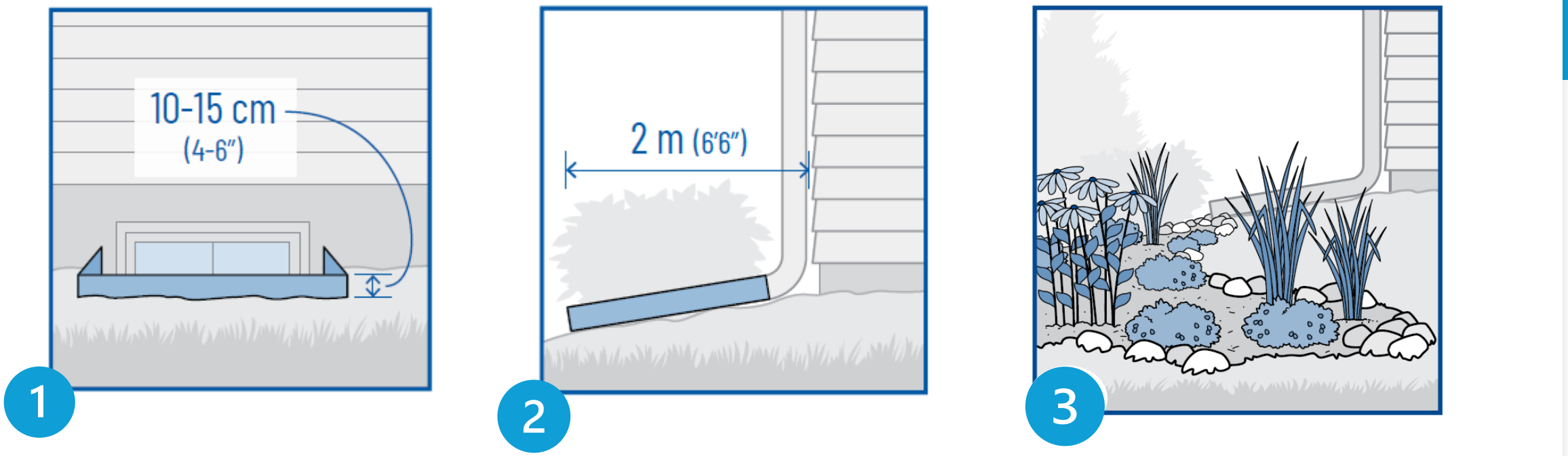
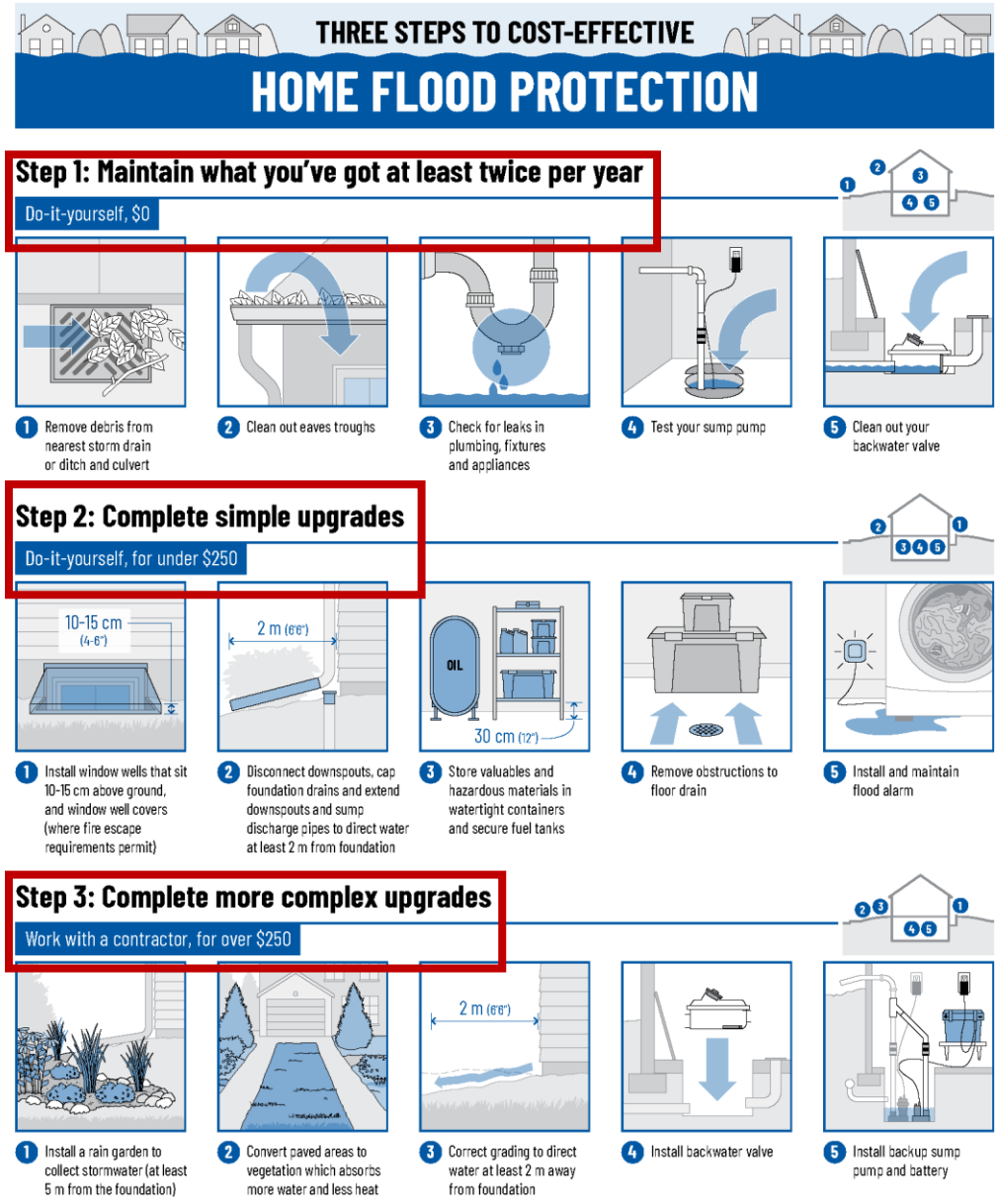


Reduce Flood Risks Outside the Home

1. **Install taller window wells:** Install window wells that sit 10-15 cm above ground, to stop water from gathering in window wells. Also upgrade to water resistant windows.
2. **Extend downspouts pipes:** Extend downspout pipes at least 2 meters from the foundation, to prevent water from seeping into the ground next to the foundation.
3. **Install a rain garden:** Work with landscapers to install a rain garden which can help absorb excess water during extreme rain events.


THREE STEPS TO COST-EFFECTIVE
HOME FLOOD PROTECTION
Step 1: Maintain what you've got at least twice per year
Do-it-yourself, $0
1 Remove debris from nearest storm drain or ditch and culvert
2 Clean out eaves troughs
3 Check for leaks in plumbing, fixtures and appliances
4 Test your sump pump
5 Clean out your backwater valve
Step 2: Complete simple upgrades
Do-it-yourself, for under $250
10-15 cm (4-6")
2 m (6'6")
OIL
30 cm (12")
1 Install window wells that sit 10-15 cm above ground, and window well covers (where fire escape requirements permit)
2 Disconnect downspouts, cap foundation drains and extend downspouts and sump discharge pipes to direct water at least 2 m from foundation
3 Store valuables and hazardous materials in watertight containers and secure fuel tanks
4 Remove obstructions to floor drain
5 Install and maintain flood alarm
Step 3: Complete more complex upgrades
Work with a contractor, for over $250
2 m (6'6")
1 Install a rain garden to collect stormwater (at least 5 m from the foundation)
2 Convert paved areas to vegetation which absorbs more water and less heat
3 Correct grading to direct water at least 2 m away from foundation
4 Install backwater valve
5 Install backup sump pump and battery
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Key Takeaways

Over the next years, temperatures will continue to increase, leading to **more extreme weather**, which **increases likelihood of wildfire, wildfire smoke and extreme heat**.

We have the tools and guidance to prepare our homes and communities ahead of the next extreme event. We must **ACT NOW.**

In the face of challenges as significant as climate change and increased risk of wildfire, **success is best achieved through a whole-of-society approach**.

Dr. Anabela Bonada
Managing Director, Climate Science
abonada@uwaterloo.ca

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