

CANADIAN VOICES ON FLOOD RISK 2020

Findings from a national survey about how we should manage an increasingly costly and common peril

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PARTNERS FOR ACTION

Advancing flood resiliency in Canadian communities

About Partners for Action

Partners for Action (P4A) is an applied research network advancing food resiliency in Canada in the face of climate change and extreme weather. P4A's collaborative approach brings together diverse stakeholders to create and share knowledge, address information needs and drive action. P4A is based in the Faculty of Environment at the University of Waterloo, with founding support provided by The Co-operators Group Ltd. and Farm Mutual Re. For more information, visit: <https://uwaterloo.ca/partners-for-action>

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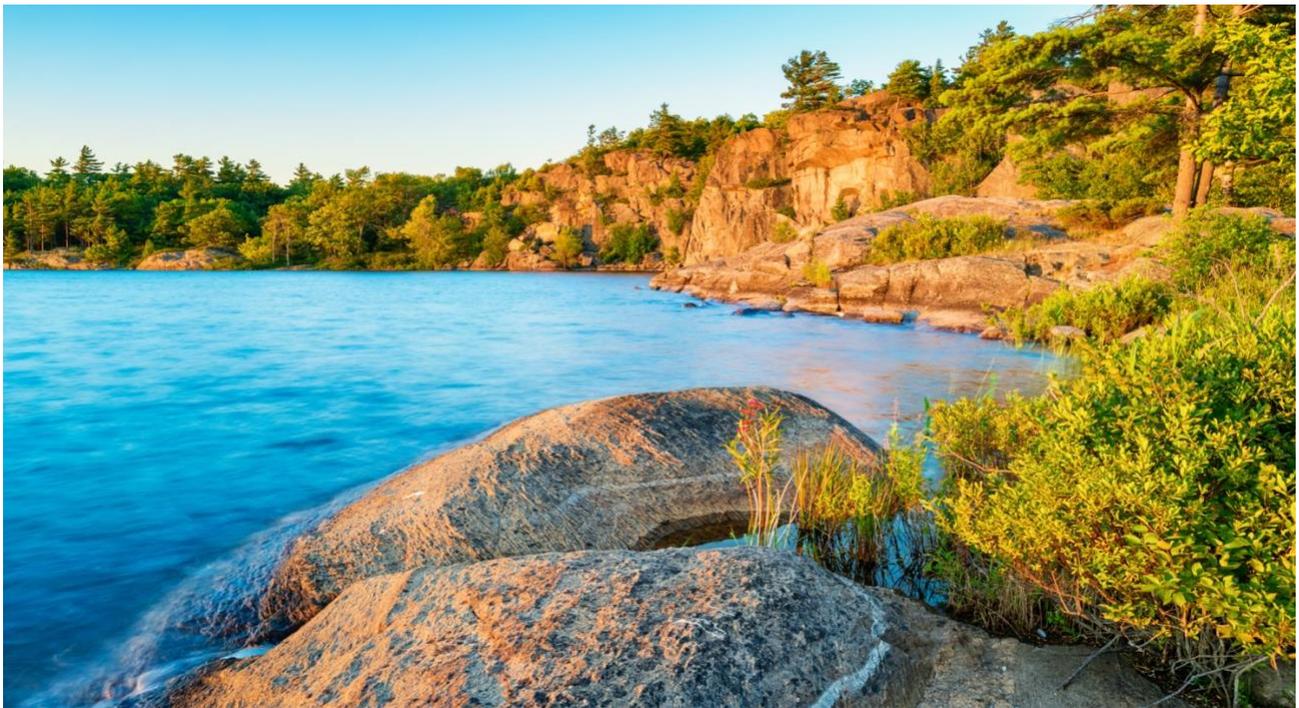
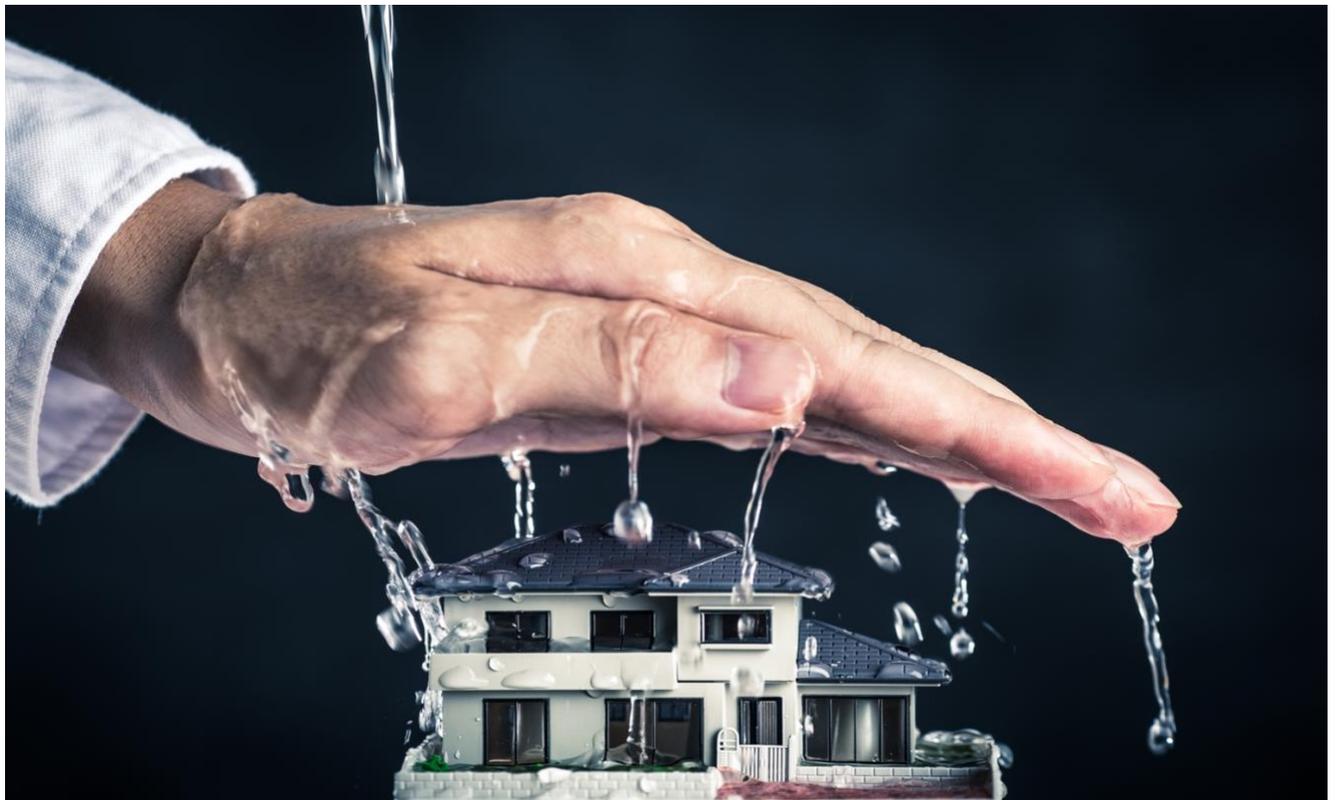


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Every year, floods in Canada cost governments and individuals billions of dollars. And that price tag keeps rising. Climate change is projected to increase extreme weather, while economic growth is driving more development in high-risk locations.¹ Without adequate risk reduction measures, experts predict that flood costs in Canada could nearly triple by 2030.²

In response, leaders in business and at every level of government are developing or considering policies and programs designed to reduce flood risks - from investing in better infrastructure to developing relocation plans. At the same time, a growing number of insurance companies are offering coverage for overland flooding.

But how are Canadians responding to these shifts in flood risk management? To find out, we surveyed 2,500 people across the country living in designated flood risk areas, asking them about everything from sump pumps to federal disaster assistance to what would convince them to relocate to higher ground.

The majority of respondents agree homeowners have a responsibility to protect their property from flooding. However, most have not taken important actions like elevating valuables in their basement, purchasing flood insurance or other steps to reduce their risk. Unfortunately, this leaves homeowners on the hook to suffer costly damages.

A major reason for this inaction is lack of flood risk awareness. Only 6% of our respondents know they live in designated flood risk areas, a finding that has not changed since 2016, when we first surveyed Canadians. Meanwhile, only a quarter report that their insurance representative had discussed flood coverage options with them.

The results of this survey highlight that more progress on flood risk reduction is needed across Canada's rural, urban and coastal communities. This includes structural measures, such as building dikes, installing better drainage and restoring forests and wetlands, while preserving naturalized areas to absorb runoff.

But non-structural measures that help Canadians protect themselves and their homes are equally important. Governments can invest in public education and updated flood maps that are made public. Municipalities can protect properties by attaching conditions to building permits for homes in designated flood risk areas. Real estate professionals can be required to disclose flood risks and past flood damage to potential buyers.

The survey helps policymakers understand the attitudes and expectations of Canadians as they develop flood-related programs. Equipped with this information, governments and other stakeholders can more effectively manage the increasing and unsustainable social burden of flooding.



KEY FINDINGS

- 97% of respondents believe that homeowners have some responsibility to protect their property from flooding.
- Only 6% of respondents know they live in a designated flood risk area.
- The majority (81%) of respondents have not reviewed flood maps for their community.
- Almost half of respondents (47%) are not concerned about flooding, while most do not have flood insurance (57%) and have not taken steps to protect their property, such as installing a sump pump (55%).
- Respondents believe the responsibility of communicating flood risks falls to multiple stakeholders, including all levels of government, insurance companies and real estate professionals.
- Opinions about property buyout programs are mixed, but signal that this is an important strategy for governments to consider: half agree that homes at risk of repeat flooding should be offered buyouts before flooding happens, but most believe buyouts should be voluntary rather than mandatory, and that the costs should be distributed across all three levels of government.

¹Bush, E., Lemmen, D.S., ed. (2019). Canada's Changing Climate Report. Ottawa: Government of Canada

² Aqueduct Tools. Aqueduct. Retrieved from: www.wri.org/aqueduct

FLOODING IN CANADA: A COSTLY PROBLEM ON THE RISE

In recent years, Canadians have become increasingly familiar with devastating floods. Along Ontario's Great Lakes, for example, rising water levels have triggered evacuations in dozens of communities. In 2018, New Brunswick saw its worst flooding on record. And in 2020, a 25-kilometre ice jam along the Athabasca River caused unprecedented flooding, forcing thousands of Fort McMurray residents to evacuate.

The Insurance Bureau of Canada estimates that one in ten Canadian homes are at high risk of flooding.³ Both urban and rural communities are at risk — we have seen floodwaters trap Toronto motorists and submerge homes along the Red River south of Winnipeg. And communities bordering lakes, rivers or oceans are not the only ones in danger. Intense storms, rising groundwater and sudden snowmelt affect inland communities as well.

Those events come with a hefty price tag. Since 2016, federal disaster assistance has totaled an average of \$430 million a year, with more than three-quarters spent on flood recovery. Insured damage from extreme weather now regularly tops \$1 billion a year in Canada, with the majority caused by water-related events. According to the Insurance Bureau of Canada, for every dollar in damage covered by insurance, Canadian taxpayers pay an additional \$3 to repair and rebuild public infrastructure.⁴



Meanwhile, climate change is warming Canada at a rate more than double the global average, bringing increases in precipitation, extreme weather and coastal flooding.⁵ As climate change accelerates, flooding continues to get worse. Experts predict the costs of flood damage to urban infrastructure in Canada could rise to \$6.6 billion in the next decade — nearly triple the cost in 2010.⁶

Importantly, Canada can act to change those numbers. It is estimated that for every dollar spent on flood risk reduction measures like dikes, berms and drainage, Canadians can avoid more than six dollars in damage costs.⁷ Bold action is required to increase flood risk awareness and better prepare Canadian communities for our changing climate.

“Insured damage from extreme weather now regularly tops \$1 billion a year in Canada, with the majority caused by water-related events.”

³ Insurance Bureau of Canada. (September 2019). IBC's Position on Flooding and Financial Security: Recommendations to Government to Deliver a National Action Plan on Flooding. Retrieved from: <http://assets.ibc.ca/Documents/Disaster/IBC-National-Flood-Action-Plan-recommendations.pdf>

⁴ Insurance Bureau of Canada. (January 16, 2019). Severe Weather Causes \$1.9 Billion in Insured Damage in 2018. Retrieved from: <http://www.ibc.ca/on/resources/media-centre/media-releases/severe-weather-causes-190-million-in-insured-damage-in-2018>

⁵ Bush, E., Lemmen, D.S., ed. (2019). Canada's Changing Climate Report. Ottawa: Government of Canada.

⁶ Aqueduct Tools. Aqueduct. Retrieved from: www.wri.org/aqueduct

⁷ Lightbody, L., Fuchs, M. (January 11, 2018). Every \$1 Invested in Disaster Mitigation Saves \$6. The PEW Charitable Trusts. Retrieved from: [https://www.pewtrusts.org/en/research-and-analysis/articles/2018/01/11/every-\\$1-invested-in-disaster-mitigation-saves-\\$6](https://www.pewtrusts.org/en/research-and-analysis/articles/2018/01/11/every-$1-invested-in-disaster-mitigation-saves-$6)

ABOUT THE SURVEY:

GIVING CANADIANS A CLEAR VOICE

Since 2016, the federal and provincial governments have taken steps to reduce the impacts of floods. For example, during the 2019 federal election campaign, Prime Minister Justin Trudeau pledged \$150 million to improve flood mapping.⁸ In 2020, he also directed the Ministry of Public Safety and Emergency Preparedness to develop a low-cost flood insurance program and a national action plan for relocating homeowners from areas at greatest risk of recurrent flooding.⁹

Meanwhile, governments at every level are increasingly exploring nature-based solutions, such as restoring ponds, wetlands and forested areas that can absorb excess water and release it slowly after extreme events.

These decisions have serious impacts for Canadians, yet we know little about public perspectives. How well do residents of designated flood risk areas understand their risks? How well do government and insurance policies align with public attitudes and expectations? How do Canadians want their fellow citizens affected by floods to be treated?



To find out, we conducted a bilingual national survey in spring 2020, a follow-up to our 2016 survey.¹⁰ The current survey engaged 2,500 people across Canada's 10 provinces who live in designated flood risk areas vulnerable to severe and recurrent flooding.¹¹

Through 48 questions, Canadians were invited to share their attitudes and opinions about issues such as flood risk perception, where responsibility lies for flood prevention and recovery from flood damages, flood insurance and property buyouts for flood risk management.

RIVERINE | Heavy rainfall or spring snowmelt causes rivers or creeks to overflow.

PLUVIAL | Heavy rainfall overwhelms storm systems in urban areas or causes flooding in rural areas where the ground is frozen or saturated and can't absorb rainfall.

GROUNDWATER | Heavy rainfall causes underground water levels to rise above ground level.

ICE JAM | River ice breaks and jams in spring cause rivers to back up and flood.

STORM SURGE | Heavy winds force waves inland from a large water body (lake or ocean).

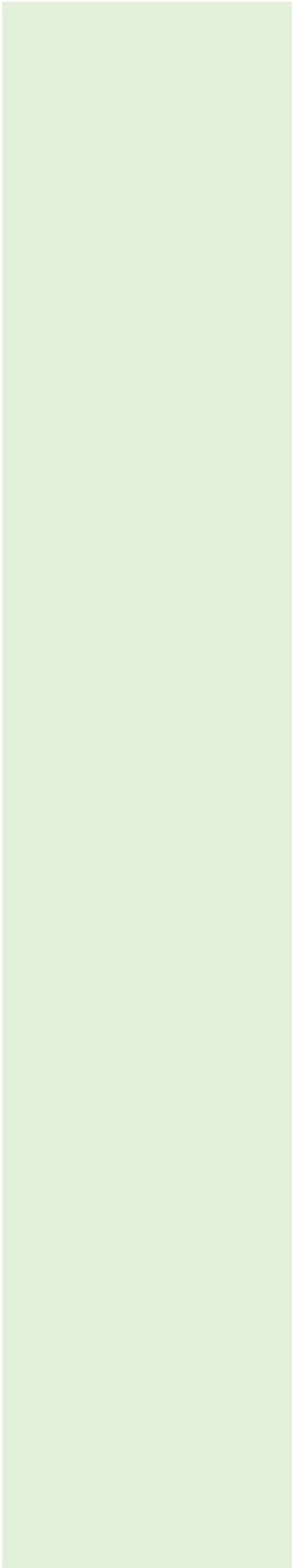
TIDAL WAVE/Tsunami | An earthquake offshore forces a large wall of water onshore.

⁸ CBC News. (March 4, 2020). Insurers warn federal government Canada can't wait a decade to update flood maps. Retrieved from: <https://www.cbc.ca/news/technology/flood-maps-insurance-1.5485475>

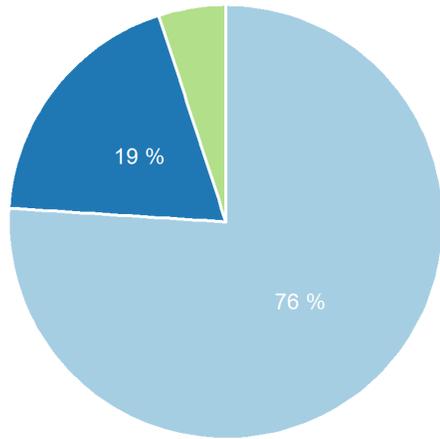
⁹ Prime Minister of Canada. (December 13, 2019). Minister of Public Safety and Emergency Preparedness Mandate Letter. Ottawa: Office of the Prime Minister. Retrieved from: <https://pm.gc.ca/en/mandate-letters/2019/12/13/minister-public-safety-and-emergency-preparedness-mandate-letter>

¹⁰ Thistlethwaite, J., Henstra, D., Peddle, S., Scott, D. (2017). Canadian Voices on Changing Flood Risk: Findings from a National Survey. Waterloo: University of Waterloo.

¹¹ de Loë, Rob. (2000). Floodplain Management in Canada: Overview and Prospects. *The Canadian Geographer* 44 (4): 322-439.

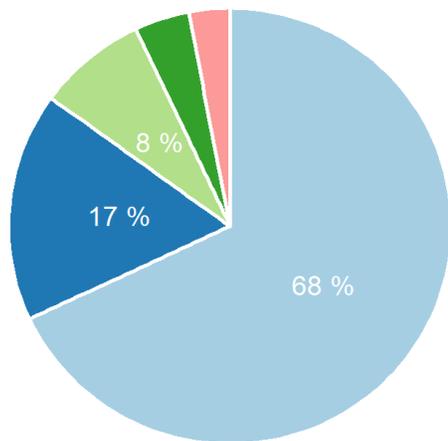


Homeownership



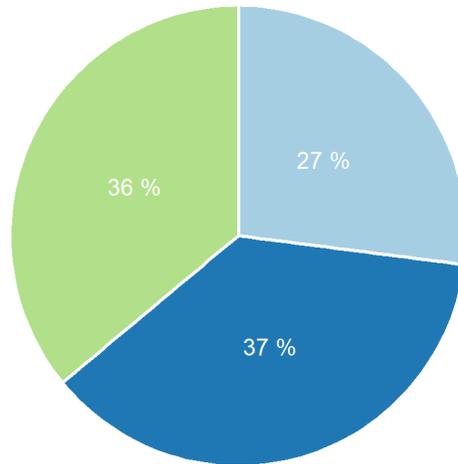
- Response
- Other
 - Rent
 - Own

Type of Home

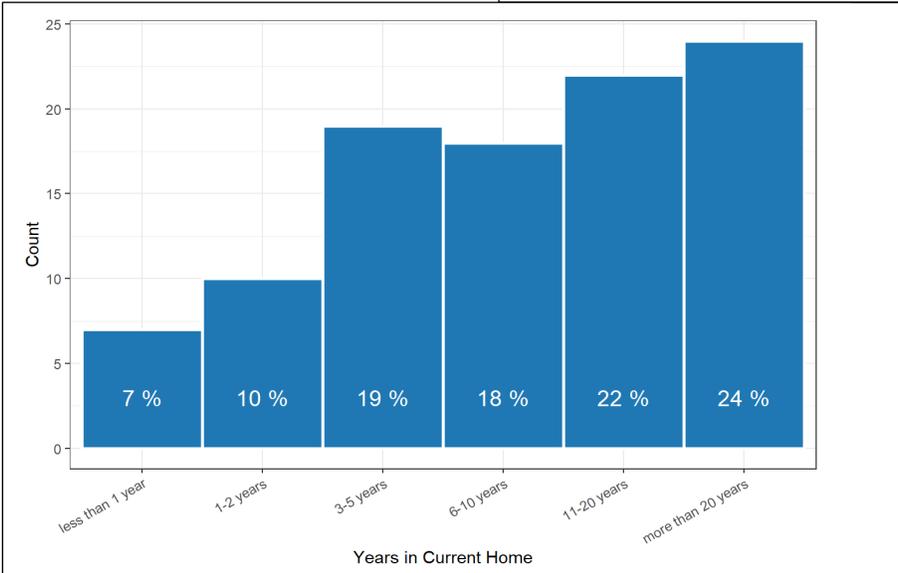
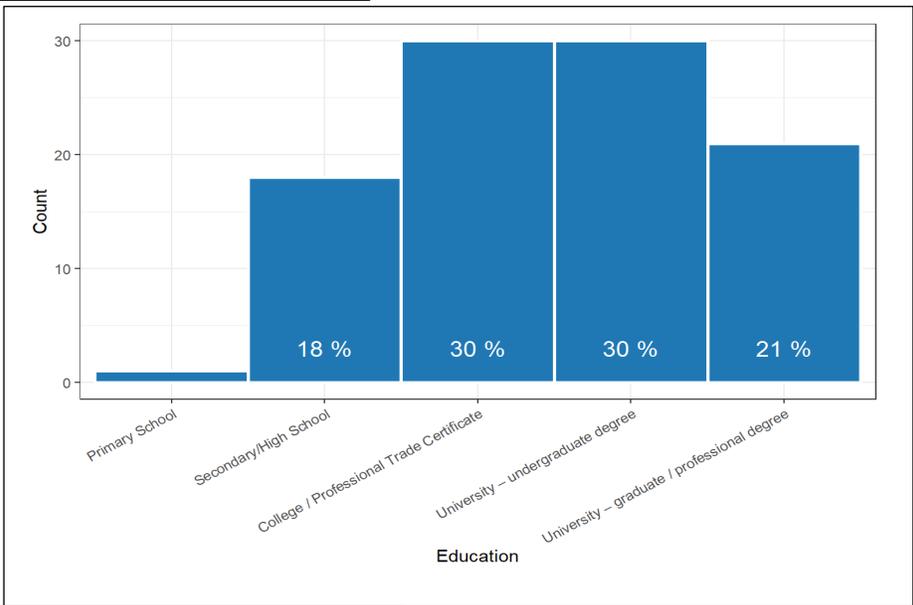
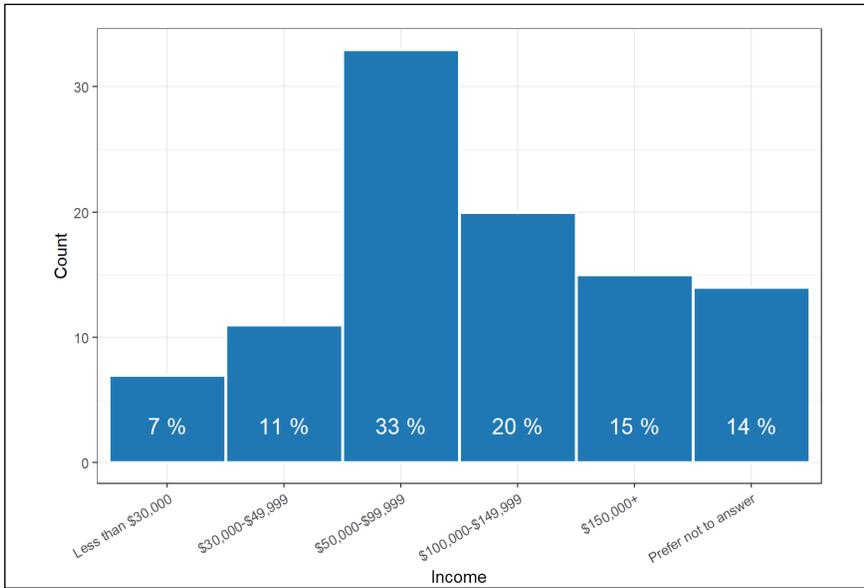


- Response
- Other (please specify)
 - Condominium (Low rise - 3 floors or less)
 - Apartment (Low rise - 3 floors or less)
 - Semi-detached or Townhouse
 - Detached house

Age



- Response
- 55 years or older
 - 35 to 54 years
 - 18 to 34 years

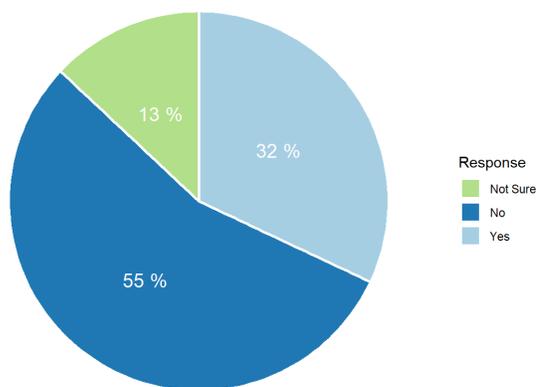


CANADIANS NOT TAKING ACTION TO REDUCE THEIR FLOOD RISK

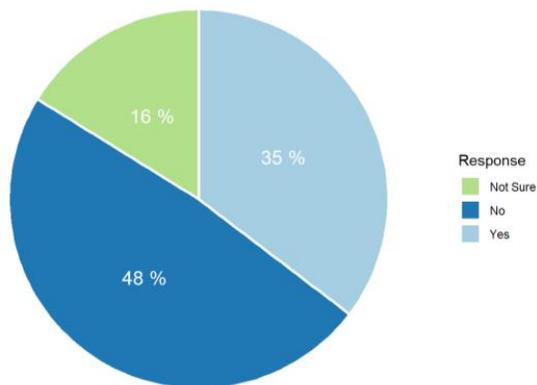
Since our previous survey in 2016, flooding has become more prevalent than ever across Canada. Despite the growing threat, few Canadians are taking action. For example, most of the survey respondents have not installed sump pumps (55%), and half have not elevated valuable items in their basement.

Although more than half of respondents (56%) strongly agree that homeowners living in designated flood risk areas should be required to purchase flood insurance, less than a quarter (23%) have done so. Furthermore, roughly half of respondents do not know whether their current insurance policy covers damage from different types of flood damage.

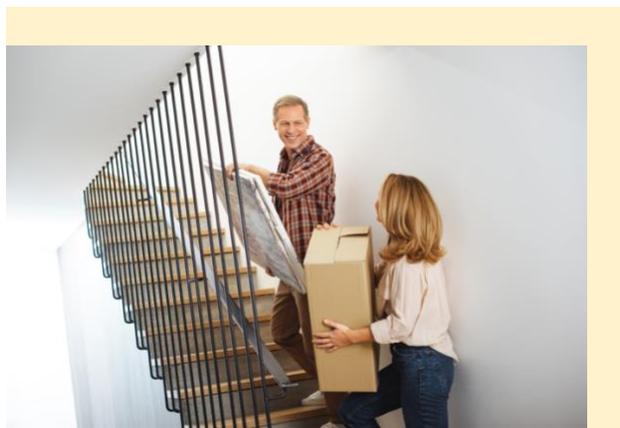
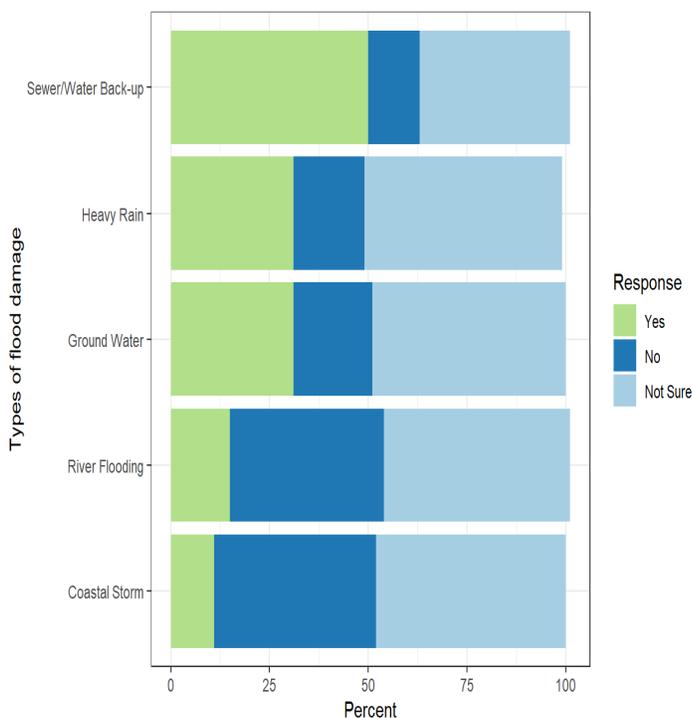
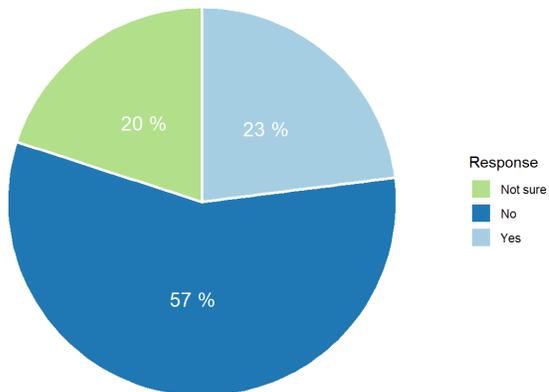
Have you installed a sump pump in your home?



Have you elevated valuable items in basement?



Have you purchased flood insurance?



DANGEROUSLY LOW PUBLIC AWARENESS

Nearly all people we surveyed (97%) agree that homeowners have some responsibility to protect their property from flooding. So why the inaction? A widespread lack of awareness about flood risk is a big reason. Canadians are not likely to take steps to reduce their risk if they do not know their home and property is at risk.

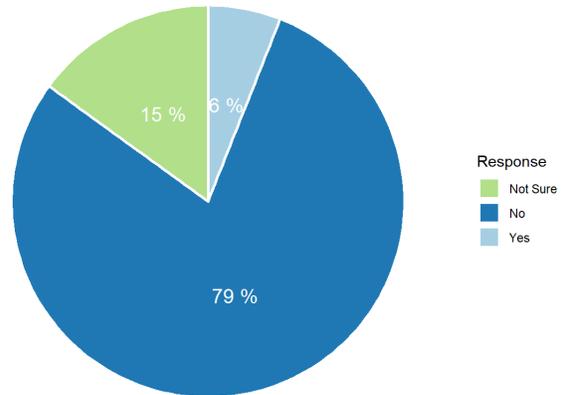
Our survey targeted people living in designated flood risk areas, yet only 6% of respondents know that their home is at risk. We saw the same results in our 2016 national survey, highlighting that public awareness has been stagnant and shows no improvement.

Almost half of respondents (47%) told us they are not at all concerned about flood risk to their home. Only 8% are moderately or extremely concerned. However, one in five respondents indicate that their home has experienced flooding either before or after they moved in. Considering the disclosure of past flood damage is not required and most people have lived in their home for less than 10 years, this proportion is likely higher.

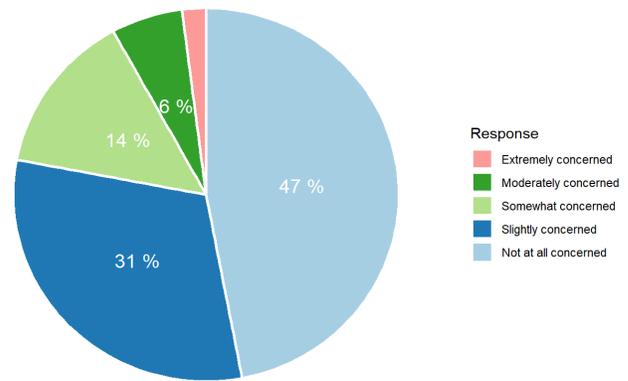
Also concerning are Canadians' perspectives on changing flood risk. While climate change scientists predict more intense storms and coastal flooding,¹² the majority of respondents (63%) do not think the flood risk to their home will change over the next 25 years.



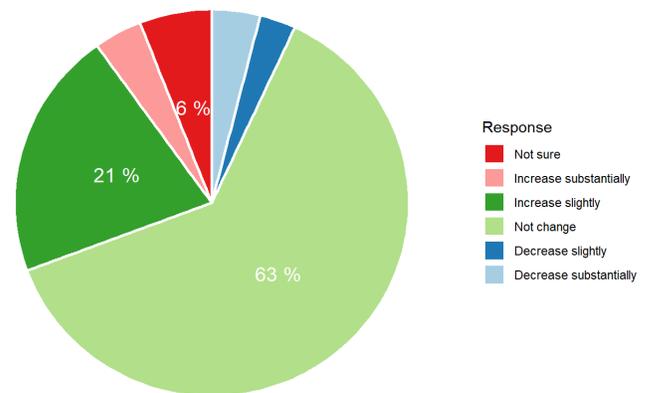
Is your home in a designated flood risk area?



Are you concerned about flood risk to your home?



Do you think the flood risk to your home will change over the next 25 years?

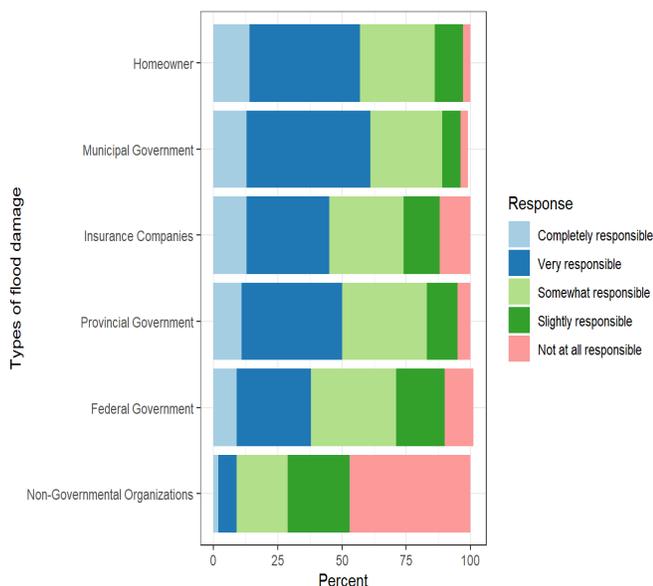


¹² Bush, E., Lemmen, D.S., ed. (2019). Canada's Changing Climate Report. Ottawa: Government of Canada.

THE BUCK STOPS WHERE?

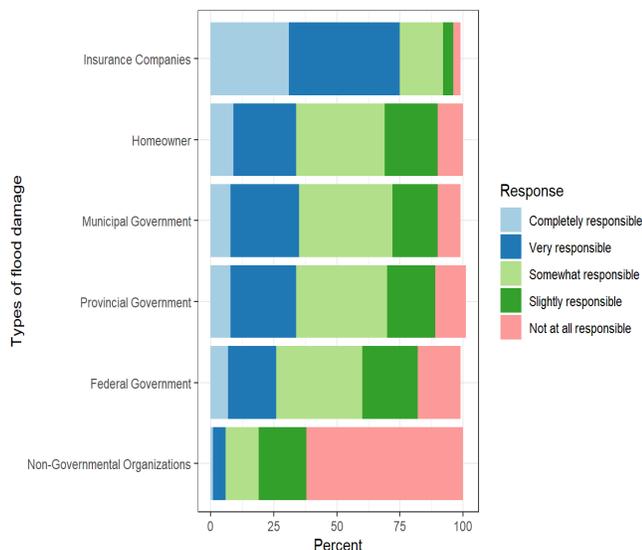
When asked about who has the most responsibility for **protecting** residential properties against flooding, respondents rank municipal governments the highest (62%), followed by homeowners (57%) and the provincial government (50%).

Protecting from flood damages



Meanwhile, when it comes to **paying** for flood damages, they indicate insurance companies have the most responsibility (76%), followed by local governments (36%), homeowners (34%) and provincial governments (34%).

Paying for flood damages



More than 40% of respondents said that government disaster assistance should pay for the full cost of flood damages. Meanwhile, more than half (52%) indicate that if government disaster assistance programs were no longer available, then they would purchase overland flood insurance.

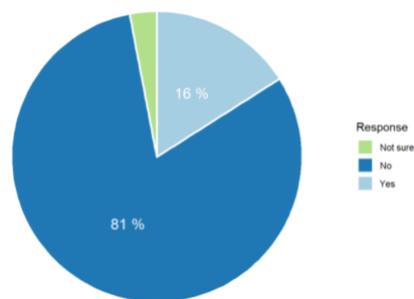
However, one size does not fit all. For example, smaller, more remote communities require additional supports. Three-quarters of our respondents (76%) agree that federal and provincial governments should make special funding available to **small communities** for assessing flood risks and creating flood action plans.



More than half of respondents (68%) assert that when a municipality issues a building permit in a designated flood risk area, it is their responsibility to protect the property from flood damage and even compensate the owner for flood damages. This is not the case today.

Another urgent area for improvement is flood maps, which are used to underwrite flood insurance, plan new infrastructure and educate home buyers. The vast majority of people we surveyed (81%) indicate that they have not viewed flood maps for their community, yet most (90%) think that flood risk maps produced by governments should be publicly available. Here, public awareness is only one part of the problem. In many cases flood maps are 20 to 25 years out of date,¹³ difficult to access or both.

Have you reviewed flood maps for your community?



¹³ CBC News. (March 4, 2020). Insurers warn federal government Canada can't wait a decade to update flood maps. Retrieved from: <https://www.cbc.ca/news/technology/flood-maps-insurance-1.5485475>

BUYERS AND SELLERS

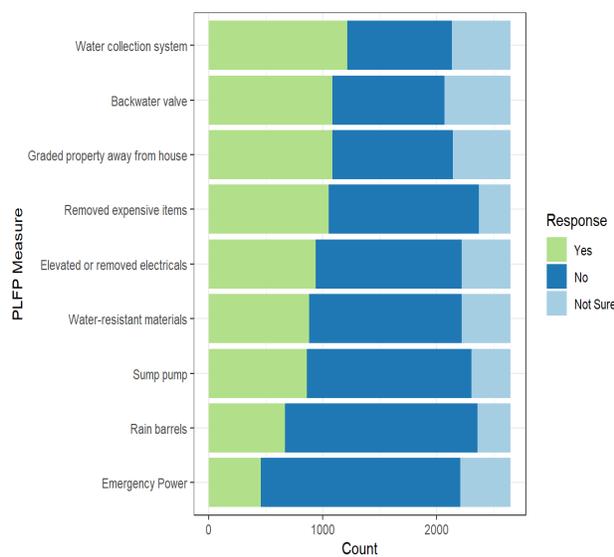
Our survey respondents saw the sale of a property as a critical time for communicating flood risk. Most (89%) agree that sellers should be required to advise potential buyers if their property is located in a designated flood risk area.

The same goes for realtors. The majority of respondents (90%) indicate that when selling properties in designated flood risk areas, real estate professionals should be required by law to inform potential buyers. At present, disclosure is only voluntary and not required.

HOMEOWNERS

A number of respondents indicated they have taken measures to protect their residence from flood damage, including re-grading the surrounding property and installing sump pumps and backwater valves.

Actions taken by homeowners

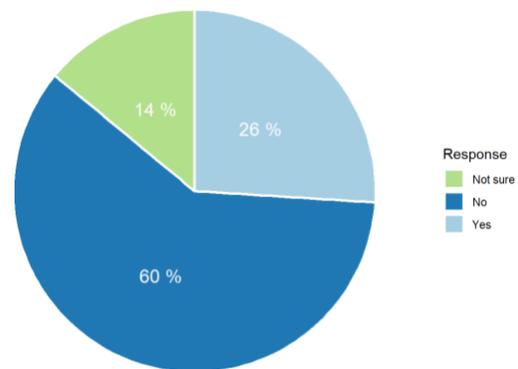


INSURANCE COMPANIES

Since 2015, a growing number of companies have started offering overland flood insurance in addition to coverage for damage from sewer-backups.¹⁴ Today, more than three-quarters of Canada's property insurance market covers damage from overland flooding.

Still, only a quarter of respondents (26%) report that their insurance representative has discussed flood insurance options with them. Most were unaware whether their current insurance policy covers overland flood damage. However, for those who submitted flood damage claims to insurance companies in the past, 83% received a payout.

Has your insurance representative discussed potential options for home flood insurance with you?



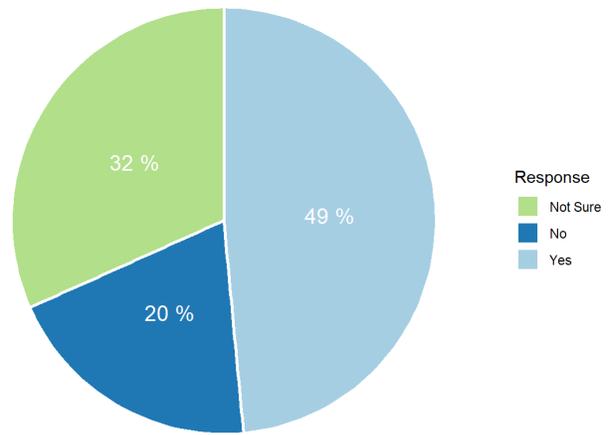
¹⁴ Meckbach, G. (June 5, 2018). Where Canada sits with overland flood insurance. Canadian Underwriter. Retrieved from: <https://www.canadianunderwriter.ca/insurance/canada-sits-overland-flood-insurance-1004132703/>

THE BIG BUYOUT QUESTIONS

Given the high financial costs and recurring safety risks associated with flooding, governments are increasingly considering relocation programs, and some like Quebec, British Columbia and New Brunswick have begun implementing them. In December 2019, the Prime Minister instructed the Minister of Public Safety and Emergency Preparedness to develop a national action plan to assist homeowners with potential relocation.¹⁵ Relocation programs typically involve government buyouts of property to move people away from areas that are vulnerable to repeated flooding.¹⁶

Half of survey respondents (49%) agree that residential properties at risk of repeated flooding should be offered buyouts before flooding occurs, but there is clearly a need for better public understanding of this approach, since 32% are unsure. And of those respondents who have experienced flooding, more than half (53%) report that they would accept a government buyout, citing the financial cost of flood recovery (39%) and risk to personal safety (37%) as primary motivators.

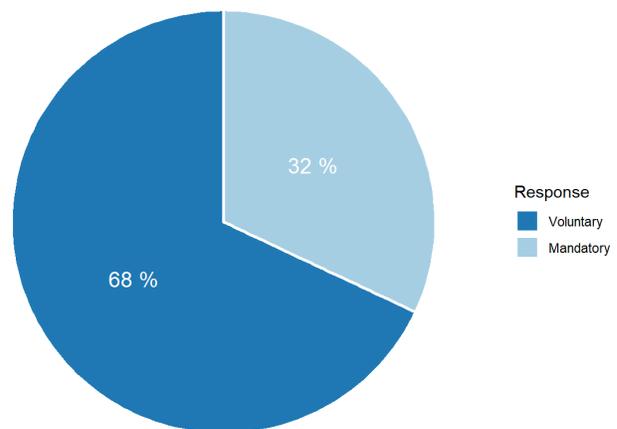
Should residential properties that are at risk of repeated flooding qualify for property buyouts by government?



However, dollar amounts matter. While attitudes are mixed about how generous publicly funded buyouts should be, most would only accept an offer at pre-flood market value (42%) or at the most recently assessed value (31%).

Another important element of buyout programs is whether to require residents to take the offer and move. Most of our respondents (68%) believe that property buyouts should be voluntary.

Should residential property buyout programs be mandatory or voluntary?



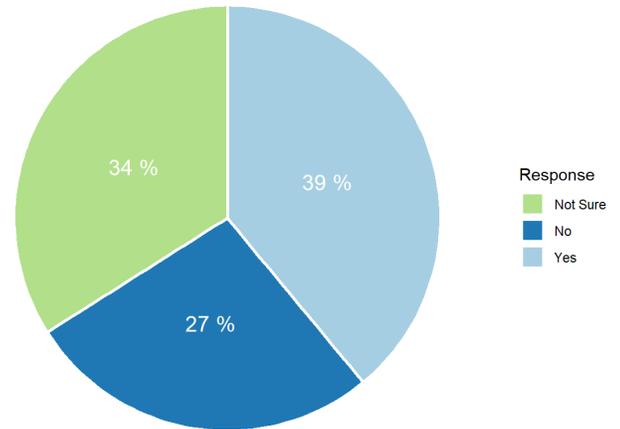
¹⁵ Prime Minister of Canada. (December 13, 2019). Minister of Public Safety and Emergency Preparedness Mandate Letter. Ottawa: Office of the Prime Minister. Retrieved from: <https://pm.gc.ca/en/mandate-letters/2019/12/13/minister-public-safety-and-emergency-preparedness-mandate-letter>

¹⁶ Thistlethwaite, J., Henstra, D., Ziiolecki, A. (2020). Managed Retreat from High-risk Flood Areas: Design Considerations for Effective Property Buyout Programs. CIGI Policy Brief No. 158. Centre for International Governance Innovation. Retrieved from: <https://www.cigionline.org/publications/managed-retreat-high-risk-flood-areas-design-considerations-effective-property-buyout>



Respondents were also asked about their views on property buyouts being available to commercial (non-residential) properties at greater flood risk. The results were less supportive, with 39% of respondents indicating yes.

Should commercial properties that are at risk of repeated flooding qualify for property buyouts by government?



Those less inclined to accept a buyout identify unfair compensation as the most likely reason to decline (34%), followed by not wanting to move to another home (29%). Only 14% of respondents identify staying close to their neighbours or community as a reason to stay.

Unsurprisingly, financial impacts were the most important factors influencing whether our respondents would accept a buyout. Most (72%) say a decrease in home value after a flood would impact their decision. In addition, three quarters (75%) somewhat or strongly agree that financial support for other transition costs are important. These could include expenses such as moving costs, legal fees, land for rebuilding and support with locating a similar home elsewhere.

Although they may be necessary, buyout programs are expensive. When it comes to footing the bill, 59% of respondents indicate that these costs should be distributed among all three levels of government, rather than leaving them to a single level of government.



RECOMMENDATIONS

Pressing issues like COVID-19 and an economic downturn have understandably shifted the national focus and government budget priorities, potentially disrupting flood-related programs. But decision-makers must recognize that flooding is not an issue they can put on the back burner, especially during a pandemic when any additional risk is a burden. Extreme weather will only get worse as our climate changes, while demand for housing will continue to drive development in high-risk areas. As we emerge from the pandemic, economic recovery programs offer an opportunity to invest in flood risk reduction such as property buyouts and flood-proofing retrofits.

In addition to improved infrastructure, we need policies and programs that boost public awareness and encourage Canadians to protect their homes from flooding. We also need collaboration. To reduce flood risks and advance our collective resilience to this threat, in rural, urban and coastal communities, all levels of government must work together, along with non-government organizations, the insurance industry and homeowners.

1. Make public education and outreach a priority

To encourage homeowners to reduce their flood risk, governments should invest more in public education and outreach on flooding. Ensuring flood risk maps are easily accessible is the important critical action all governments should immediately take so that home buyers can protect themselves from financial disaster.

Flood risk awareness among Canadians remains critically low. There has been no improvement in awareness among those who live in designed flood risk areas (6% in both 2016 and 2020). Cities, towns and rural communities are often left with the responsibility of educating their residents about flood risk prevention and response. However, they are often under-resourced — lacking the expertise, capacity and financial resources to undertake the sustained communications efforts required. Raising awareness about flood risk and encouraging Canadians to take action to prevent and prepare for flooding will require ongoing attention. Resources allocated to improving flood risk awareness among Canadians should match these longer-term needs.

2. Provide options for relocation in the form of property buyouts.

Canadians living in areas that repeatedly flood need viable options. Governments should earmark financial resources for property buyout programs and should work collaboratively to share in the costs. Much work must be done to inform Canadians of the financial and public safety benefits of relocating from high-risk areas, given low public awareness of flood risk among Canadians and a false belief that flooding will not worsen in the coming decade.

3. Increase both collaboration and accountability in flood risk management.

Beyond governments, many stakeholders have a role to play in managing flood risk, including builders, developers, insurers, real estate professionals, lenders and others. Collaboration between these actors is crucial to make sure information is shared and responsibility is clearly divided. But only governments have the legitimacy to hold these parties accountable for their decisions and actions. Regularized monitoring and reporting would help to solidify flood risk management as a growing priority.



ABOUT THE AUTHORS

Anna Ziolecki is director of Partners for Action at the University of Waterloo, an applied research network of collaborators from academia, government, the private sector and nongovernmental organizations, who are committed to advancing flood resiliency in a changing climate. Anna has conducted interdisciplinary research on contemporary policy issues, including property buyouts, municipal stormwater management programs and related government economic incentive programs, vulnerable populations and natural disasters, and challenges of communicating extreme weather events to the public.

Jason Thistlethwaite is Associate Professor in the School of Environment, Enterprise and Development (SEED) at the University of Waterloo. His research focuses on the financial risks of climate change, natural disasters, and extreme weather. His recent work explores the role of insurance and government risk management in promoting climate change adaptation and reducing economic vulnerability at the local level. To inform this research, he has worked directly with business and government leaders in the insurance, banking, real estate, building, and investment industries. This research has been published in numerous academic and industry journals and is supported by government and private-sector funding.

Daniel Henstra is Associate Professor of Political Science at the University of Waterloo. His research focuses on the governance of complex policy areas such as climate change adaptation, emergency management and flood risk management. He has more than 20 years of experience in applied policy analysis, including contract research for Global Affairs Canada, Health Canada, Infrastructure Canada, Natural Resources Canada, Public Safety Canada, and others.

Daniel Scott is a Professor and Research Chair in Geography and Environmental Management at the University of Waterloo, where he is also the Executive Director of the Interdisciplinary Centre on Climate Change. He has advised and lead climate change projects for a wide range of government agencies and businesses around the world, including the United Nations World Tourism Organization, United Nations Environment Programme, World Meteorological Organization, World Bank, European Tourism Commission, World Travel and Tourism Council, and the International Olympic Committee. He has also been a contributing author and expert reviewer for the United Nations Intergovernmental Panel on Climate Change Third, Fourth, Fifth, and Sixth Assessment Reports.



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