



PARTNERS FOR ACTION

Advancing flood resiliency in Canadian communities

COMMUNICATING FLOOD RISK TO CANADIANS: UNDERSTANDING THE CHALLENGES AND DEVELOPING BEST PRACTICES

Findings from a research workshop

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Table of Contents

ACKNOWLEDGEMENTS	ii
EXECUTIVE SUMMARY	2
FLOODING AND SHARED RESPONSIBILITY	3
FLOOD RISK COMMUNICATION	4
WORKSHOP DESIGN	5
PERSPECTIVES ON FLOOD COMMUNICATION	6
PRINCIPLES OF EFFECTIVE FLOOD RISK COMMUNICATION	7
I. <i>TARGET CAMPAIGNS AND MESSAGING</i>	7
II. <i>OFFER CLEAR, STRAIGHTFORWARD ADVICE</i>	7
III. <i>MAKE “FLOOD RISK” UNDERSTANDABLE</i>	8
IV. <i>CRAFT MESSAGES WITH THE AUDIENCE IN MIND</i>	9
V. <i>USE A POSITIVE TONE</i>	10
VI. <i>COMMUNICATE THROUGH TRUSTED SOURCES</i>	10
VII. <i>LEVERAGE SOCIAL NORMS</i>	11
VIII. <i>TAILOR MESSAGING TO FLOOD TYPE</i>	12
CHALLENGES	13
I. <i>LACK OF COLLABORATION OR REPETITION</i>	13
II. <i>LACK OF RESOURCES</i>	13
III. <i>INADEQUATE ACCESS TO FLOOD RISK INFORMATION</i>	13
IV. <i>DIFFICULTY IN EVALUATION</i>	14
CONCLUSION	15

Executive Summary

Every year, Canadians in one part of the country or another are affected by floods. Reducing flood risk requires a coordinated effort and shared responsibility between governments, non-governmental organizations, industry and other stakeholders who have resources that can contribute to these efforts. Individual Canadians also have a role to play in managing flood risk, by preparing for flood emergencies and adopting property-level protection measures. However, Canadians lack awareness of their flood risk and are therefore unlikely to adopt protective behaviours.

Partners for Action hosted a workshop in the spring of 2019 to explore how flood risk information could be better communicated to Canadians in order to encourage personal protection, increase property- and community-level flood resilience and reduce reliance on federal disaster assistance following flooding events. Based on presentations, a facilitated panel discussion and small, focused group discussions, participants learned that effective flood risk communication has some key characteristics:

- *targeted*: based on an understanding of the target group's characteristics (e.g., demographics, housing type), messages should be customized to ensure relevance to the audience;
- *straightforward*: messages should include specific actions that individuals should take and explain why these are important;
- *understandable*: rather than using technical terminology (e.g., 100-year flood), flood risk should be expressed over a meaningful time period, such as a 25- or 30-year mortgage lending period, to make it more understandable to a non-expert audience;
- *written in non-technical language*: considering the modest literacy and numeracy skills of Canadians, messages should be written using non-technical plain language to ensure broad understanding and avoid confusion;
- *positive in tone*: messages framed with an optimistic and hopeful tone are more likely to capture public attention and persuade people to take protective action;
- *delivered through a trusted source*: partnerships with employers, non-governmental organizations and the media, which are among the most trusted sources of information in Canada, could increase the impact of flood risk communication;
- *designed to leverage social norms*: publicizing the actions taken by community members would help to induce others to act, because people are often motivated by observing the behaviour of others; and
- *tailored to flood type*: in light of information overload, communication should be limited to key messages that are most relevant to the dominant flood type a community faces.

Flooding and Shared Responsibility

Flooding is Canada's most frequent and costly natural hazard. Flooding has many negative consequences for communities, including population displacement, disruption of critical infrastructure, business interruption, threats to physical health and a range of mental health impacts including post-traumatic stress disorder, depression and anxiety. Flood recovery consumes more than 75% of federal disaster assistance payments, totalling more than \$670 million annually, and uninsured flood damage costs Canadian property owners almost \$600 million out of pocket per year. Flooding is also expected to become more frequent into the future, as climate change, population growth and development in flood-prone areas put more people and property at risk.

Although governments have primary responsibility to manage flood risk, individual Canadians must also play a role in protecting themselves and their property from flood impacts. This sharing of responsibility is impeded by the fact that most Canadians lack awareness of flood risk and the actions they can take to reduce this risk. A 2016 survey conducted by Partners for Action, for example, found 94% of Canadians living in designated flood risk areas did not know they were exposed to flood hazards. The majority of respondents, moreover, had not pursued government incentives for property-level flood protection, purchased overland flood insurance, or taken personal actions to protect their property from flood. Finally, most Canadians are unaware of the details of their home insurance coverage and lack knowledge about the role of insurance versus disaster assistance in the event of flood damage.

In the spring of 2019, Partners for Action hosted a full-day research workshop to explore how flood risk information could be better communicated to Canadians. The objective was to identify strategies to better encourage personal protection, increase property- and community-level flood resilience and reduce reliance on government disaster assistance following flooding events. A diverse group of subject matter specialists and practitioners were engaged to offer different perspectives, explore best practices and generate principles for effective flood risk communication.



Flood Risk Communication

Communicating flood risk to the public has two main objectives. The first objective is to encourage people to implement property-level flood protection measures such as purchasing overland flood insurance, installing a sump pump, extending downspouts away from the home and grading property to ensure water flows away from the foundation. Risk communication of this kind is typically initiated by municipalities, government agencies, non-governmental organizations and some private sector organizations.

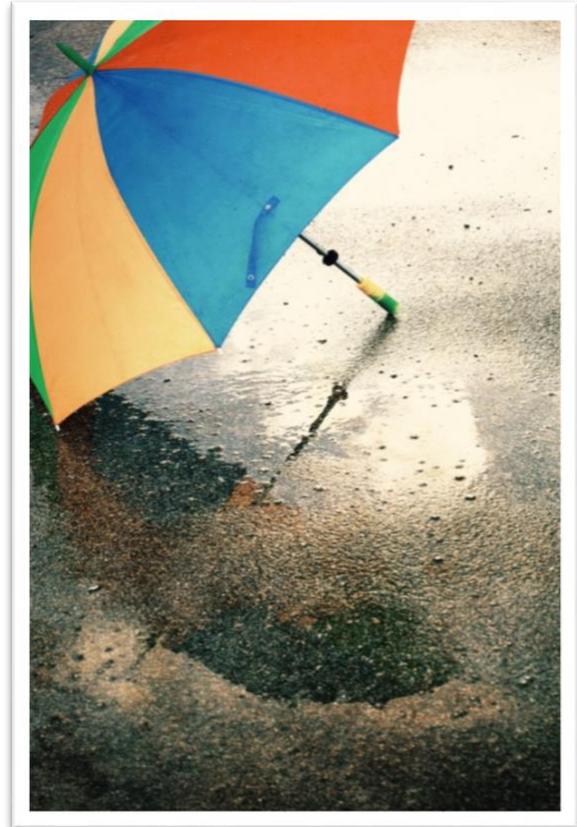
The second objective of flood risk communication is to induce households to plan for flood emergencies by, for example, assembling a disaster readiness kit, knowing evacuation routes and understanding eligibility rules under government disaster assistance programs. Flood emergency preparedness advice is typically communicated by governments but also by non-governmental agencies such as the Red Cross, the Insurance Bureau of Canada and conservation authorities (in Ontario).



Workshop Design

The workshop involved three interrelated segments designed to share knowledge and ideas about effective flood risk communication. These included:

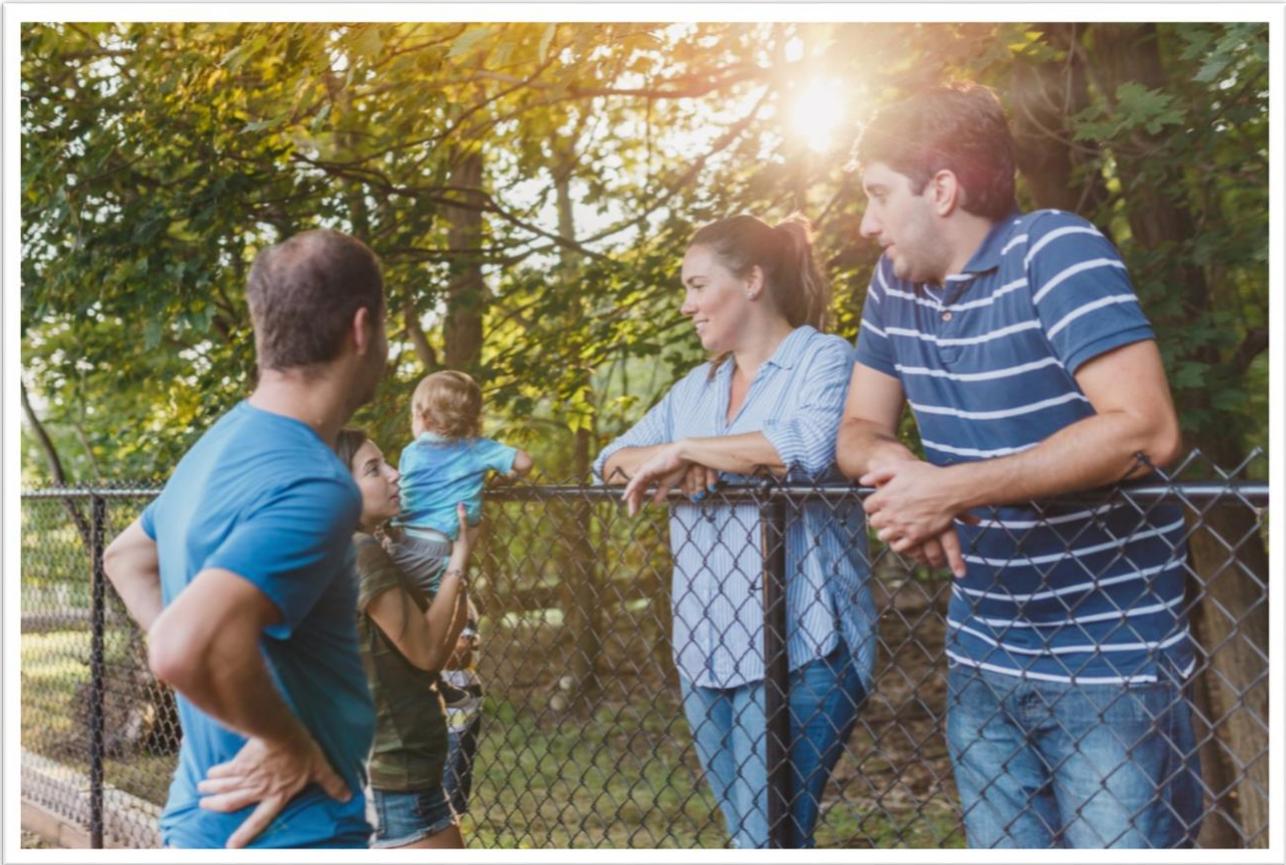
- individual presentations by expert researchers and practitioners from fields such as community-based social marketing, risk communication, behavioural economics and behavioural change;
- a facilitated discussion involving a panel of municipal emergency management and conservation authority professionals, who shared their experiences with flood risk communication and recounted the challenges they faced; and
- small group discussions that offered all participants an opportunity to exchange ideas, share experiences and observations and discuss specific aspects of flood risk communication. Topics included hallmarks of effective past flood risk communication programs in Canada and internationally, information that is essential to communicate to the public, actions households should take to reduce their flood risk and how to persuade individuals to adopt these behaviours.



Perspectives on Flood Communication

The workshop was attended by more than 40 participants with diverse professional expertise, including communications and public outreach, environmental technology, emergency management, insurance and more. Participants from different sectors were purposively invited to achieve a diversity of views and experiences. A wide range of organizations was represented,

including provincial and municipal government departments, conservation authorities, insurance firms, industry, non-governmental bodies, professional associations and academia. This broad representation enriched the discussion and allowed for intergovernmental, cross-sectoral and interdisciplinary knowledge exchange.



Principles of Effective Flood Risk Communication

Canadians are inundated with information; their attention is divided across many channels. The pace and volume of information exposure makes it difficult for officials to break through the “cognitive noise”—a term used in the field of risk communication to describe the many worries competing for one’s attention. The workshop presentations and discussion revealed that effective flood risk communication is targeted, straightforward, understandable, written in non-technical language, positive in tone, delivered through a trusted source, designed to leverage social norms and tailored to flood type. Each of these principles is discussed in turn below.

i. Target campaigns and messaging

Past flood-related communication assumed that the passive distribution of technical information about flood hazards via a website or mail-out would be sufficient to focus public attention and motivate protective actions. The implicit logic behind this approach is that, once informed of risks, individuals will engage in property- or community-level flood safety actions. In fact, communication experts estimate that most individuals are unlikely to voluntarily implement property-level flood protections. Achieving better uptake, they argue, requires more targeted and persuasive campaigns that consider audience needs and characteristics.

A first step in designing a persuasive flood risk communication campaign is to understand characteristics of the intended audience. Important data about flood-prone neighbourhoods includes, for example, the demographic profile of residents (e.g., age, income, education level), their past experiences with flooding (e.g., have they experienced a flood evacuation?), whether they have made

past flood insurance claims and so on. Armed with this information, officials are better equipped to understand the reasons why people might not take action to reduce their flood risk and then design messages that target these factors.

In a neighbourhood dominated by rental housing, for example, flood risk messaging is better focused on household emergency preparedness and the adequacy of tenant insurance to cover flood-related damages than on property-level protection measures that assume home ownership (e.g., installing sump pumps, disconnecting downspouts).

One participant highlighted an interactive website in the United States that was promoted extensively via social media, which allowed residents to search their address to receive property-specific flood risk information, a list of recommended protective actions, and support resources such as names of reputable local contractors. In the absence of such an information portal in Canada, local and regional officials must collect the necessary information and package it for relevant audiences.

ii. Offer clear, straightforward advice

Flood risk messaging is often ineffective because it lacks specific direction about the actions exposed individuals should take, fails to explain why these actions are important and does not incorporate elements that make the messages memorable. Experts in community-based social marketing argue that triggering behavioural change among target audiences requires officials to identify specific actions and then use a variety of techniques to encourage individuals to take up these actions.

Community-based social marketing is an approach to achieving broad behavioural change in communities. It combines insights from psychology and social marketing and employs direct, personal contact among community members, while seeking to remove barriers to socially desirable actions and behaviours.

For example, if the desired behaviour among targeted individuals is to assemble an emergency kit, then public officials should provide specific guidance on what to include in the kit and why, as well as explain the importance of the kit to personal or household flood safety. Focusing messages on specific actions reduces the risk of information overload, which makes people tune out, and increases the likelihood that they will remember and prioritize the advice.

Experts at the workshop stressed that inducing behavioural change requires communication that is designed to “reinforce the target behaviour (the action you want someone to take) and discourage the competing behaviour (e.g., choosing to delay or avoid action).” This is accomplished by decreasing the real and perceived barriers to the action and increasing its perceived benefits while also increasing the perceived barriers to the competing behaviour and decreasing its perceived benefits.

iii. Make “flood risk” understandable

Knowledgeable experts typically quantify and discuss flood hazards using probabilities: the 100-year flood, for example, refers to a flood the magnitude of which has a 1% chance of occurring in any given year. Research has shown, however, that the public finds this terminology confusing. As a result, people underestimate the likelihood that they will be affected by flooding and discount the risk that a flood will reoccur

after it has happened once. In the 2016 survey conducted by P4A, for instance, only about 30% of respondents answered correctly that a home in a 1-in-100-year-flood zone has a roughly 25% chance of being flooded over a 25-year mortgage period.

One presenter, who had studied the optimal way in which to present flood probabilities to the public, argued that our perception of danger is skewed. People tend to overestimate the probability of rare, extreme events while underestimating the risks associated with hazards that are more common. Based on the presenter’s research, the remedy to this distorted risk perception is to communicate risk using *cumulative probability*—the likelihood that a risk outcome will occur within a specified time period—rather than *annual probability*.

For example, instead of informing people that their property faces a 1% (or 1-in-100-year) annual flooding probability (which individuals might discount as insignificant), officials should frame the risk within a more comprehensible time period, such as the life of a residential home mortgage (e.g., 26% chance of flooding over 30 years). In controlled testing of these flood risk messages, the latter framing increased the proportion of participants willing to take preparedness actions from 60–70% to 78–81%.



This approach to presenting risk was also more effective in encouraging people to purchase overland flood insurance, an essential yet underused tool to manage household flood risk. The workshop presenter mentioned above found that people were more likely to purchase flood insurance when the risk probability was presented over a 30-year period, which is a meaningful timeframe because it is a common mortgage lending term and therefore resonates with many homeowners. The broader principle from this example is that officials must choose terminology that is understandable to the audience and is most likely to spur desirable behaviour.

iv. Craft messages with the audience in mind

Related to the previous point, the language and terminology used in flood risk communication with the public must be appropriate for the intended audience. One presenter noted that many Canadians have weak literacy skills (i.e., the ability to acquire and communicate meaning through language) and numeracy skills (i.e., the ability to make informed decisions based on

quantitative or spatial information). It is therefore counterproductive to use terms such as *fluvial* and *pluvial* to describe types of flooding, or to refer to flood-related hazards using terms such as *contamination* and *groundwater*, which might be misunderstood by many people.

One participant commented that the technical language used in flood communication in their community had resulted in frequent 911 calls from residents confused about their risk or the actions they should take. Many others also remarked on the complexity of flood communication messages, and they stressed the importance of using inclusive, simple and clear language. One participant noted that technical terminology is important if experts working in this space are the intended audience (e.g., engineers, planners). However, when presenting information to the public, it is important that messages are written at level that is appropriate to the literacy and numeracy skills of the audience.

Watch the Wording!

Nearly half of Canadians have literacy skills that fall below high school equivalency, and more than half score in the two lowest skill levels in numeracy. Writing experts typically recommend using language suitable for a reading level of Grade 9 or lower to maximize its reach.

<input checked="" type="checkbox"/> Don't say	<input checked="" type="checkbox"/> Say
close proximity to	near
comply with	follow
in the near future	soon
is authorized to	may
magnitude	size
monitor	watch
numerous	many

Tip: Some office software programs can help you assess the reading level of text documents. Review the reading level of communication materials before distributing these to the public.

v. *Use a positive tone*

Research in this field has shown that communication that evokes negative emotions such as fear and sorrow is more likely to cause individuals to ignore or discount the message rather than take action. Canadians are frequently exposed to negative and frightening messages about formidable contemporary issues such as climate change, environmental degradation, income inequality and so on, and this communication can make people despondent. One presenter illustrated this point by showing an image of a stranded polar bear floating on a piece of ice, which was used to communicate the gravity of climate change but instead caused audiences to feel powerless and helpless.

Every year, Canadians see images of flood devastation in one part of the country or another, and there is a risk that they will feel overwhelmed and disengaged. It is therefore important for flood risk communicators to adopt an optimistic and hopeful tone when framing messages in order to nudge people into action. Developing communication materials that seek to make recipients more hopeful about being equipped and capable of taking action to improve their flood resiliency are more likely to keep the public's attention and lead to action.

Examples of ways to make flood communication more positive or hopeful include:

- writing action-oriented statements that explain precisely what the person should do and why it is important;
- including imagery (photographs, animation, sketches) that represents people helping themselves by doing something about the issue, such as assembling an emergency kit, sealing basement windows, or extending downspouts;

- making the message or campaign memorable by inserting humour or catchy statements (e.g., the Slip, Slop, Slap campaign from Australia encouraging use of sunscreen to protect against harmful sunrays by encouraging people to slip on a shirt, slop on sunscreen and slap on a hat); and
- showcasing success stories of those who took action to become more resilient.

One risk communication expert cautioned that even though fear-based messaging does not work for everyone, strong language to communicate an important message is required leading up to and during an emergency situation. It is, however, necessary to accompany strong language statements with an explanation as to why the desired action is important (e.g., avoid entering floodwaters because they contain dangerous contaminants and bacteria that will make them ill).

vi. *Communicate through trusted sources*

One presenter stressed that trust between the sender and receiver is essential for effective flood risk communication. Distributing messages through trusted sources increases the likelihood that people will pay attention and act in response. The presenter referenced the Edelman Trust Barometer Report on Trusted Sources, an annual survey that reports on society's most trusted sources of information. In 2019, the report indicated that people place greatest trust in their employer (about 80%)—largely due to regular contact—as well as non-governmental organizations (59%) and the media (57%). By contrast, fewer Canadians regard the business sector (56%) and government (53%) as the most trusted source of information. These results suggest that the effectiveness of flood risk communication could be strengthened through partnerships.



During the workshop’s panel discussion and small group discussions, participants highlighted the importance of communicating to and through youth as an effective access point for reaching adults and decision makers. Some noted that the assumption that children have no power in flood adaptation and preparedness is flawed because children often communicate what they are learning to their parents; therefore, flood risk communication and outreach programs geared towards Canadian youth can provide an excellent opportunity to reach parents as well.

Communication experts stressed that one of the most effective ways to reach people is through word of mouth. Hearing information about flooding and flood preparedness from people in one’s life—family, friends, neighbours and co-workers—inspires greater trust in the message and makes action more likely. While this is largely an organic process (i.e., it occurs naturally), communication and educational materials should emphasize the importance of talking to friends, family and neighbours about taking specific steps to prepare for flooding and to reduce flood risk at the property level.

vii. *Leverage social norms*

Social norms are unwritten but generally accepted rules about acceptable behaviour in a social group or culture.

According to community-based social marketing experts, people are more likely to do what they see others doing. To create social norms around flood resiliency, therefore, it is important to publicize the actions taken by some in order to induce others to adopt similar behaviours. One participant noted that community members need to see and be reminded about the importance and outcomes of their contribution to flood resiliency. Before or after a flood event, for example, sharing real-life stories of flood impacts and how others reduced them through personal actions is a powerful mechanism to introduce and reinforce social norms.

- Tools for Communicating Flood Risk**
-  interactive flood map
 -  information handouts about preparedness
 -  infographics on websites
 -  professional home flood risk report
 -  information sheet for new homebuyers
 -  social media campaign

Leveraging Social Norms for Flood Risk Communication: Examples

A 2013 study in Australia found that people were more likely to purchase flood insurance if they perceived there was a social norm to do so (i.e., if their family, friends or other people like them purchased flood insurance).¹

In a 2019 study, participants who made a formal commitment to become better prepared for floods increased their preparedness more than those who were not asked to make the commitment.²

¹ Lo, Alex Y. 2013. "The Role of Social Norms in Climate Adaptation: Mediating Risk Perception and Flood Insurance Purchase." *Global Environmental Change* 23 (5): 1249–1257.

² Howe, Piers D. L., Adriana Vargas-Sáenz, and Ilona M. McNeill. 2019. "Commitments Increase Preparedness for Floods." *PLOS ONE* 14 (8): 1–8.

viii. Tailor messaging to flood type

Canadians face many different types of flooding—riverine, coastal, stormwater and so on—but the dominant hazard type varies considerably by geography. There are many protection and preparedness actions that are universally applicable, such as acquiring adequate insurance coverage, stocking up on emergency supplies, developing an emergency evacuation plan, storing valuables on higher ground and talking to one’s family and friends about flooding.

Given the intense competition for public attention, however, several participants argued that protection and preparedness advice contained in flood risk communication messages should be targeted at the primary flood type that most threatens a community. It makes little sense, for instance, to advise those living along rivers to clean their eavestroughs and downspouts, when assembling a “grab and go” evacuation bag is more important. Focusing

messages on key actions that are relevant to the flood type and why they are important is essential for effective flood risk communication.



Challenges

There are a number of challenges for effective flood risk communication in Canada. This section summarizes some of these challenges and the ideas shared by participants about how to address them.

i. Lack of collaboration or repetition

Effective flood risk communication requires a sustained effort among multiple stakeholders. However, numerous participants lamented that government departments often operate in siloed isolation, rarely working with other departments to share knowledge and resources on flood risk communication. Others expressed frustration about past experiences with neighbouring municipalities whose lack of communication had an impact on how a flooding event unfolded in their community. Several participants stated that there are not enough opportunities for bringing these organizations and agencies together, although doing so would be valuable for sharing approaches to, and experiences with, flood risk communication with the public.

Several contributors stressed the importance of coordinating communication efforts between government departments and among levels of government in order to ensure consistency in the information that is produced and disseminated to the public. Although there was no consensus among the group on who should be primarily responsible for flood risk communication, many participants argued that key messages around personal- and property-level protection and preparedness must be repeated regularly by many sources, including the federal government, provincial governments, municipalities, realtors, insurers and contractors conducting projects at the property level. For example, various participants stated that realtors should share flood-related information with potential buyers,

including the home's history of flood, current risks and any flood mitigation products in place on the property. As one communication expert stressed: risk communication is a process, not a single event.

ii. Lack of resources

Workshop participants commented that many organizations lack the resources to conduct adequate and effective flood risk communication. One participant pointed out that there is more attention and communication material on pre-flood planning, while less information is available for people to know what to do after a flood. More communication and awareness-building resources are necessary for Canadians to understand the recovery stage, which involves the difficult process of communicating with governments and insurers, assessing property damage and rebuilding.

One participant noted that emergency management personnel are often over-extended, taking on responsibilities outside of their core mandate, which leaves little time for creating effective and thoughtful communication and outreach campaigns. Clearly more resources will need to be devoted to flood risk communication as the threat of flood damage increases into the future.

iii. Inadequate access to flood risk information

A number of participants commented on the lack of information available to the public for making informed choices about buying homes in flood-prone areas. Unlike in other countries like the United States and Australia, Canadians lack an interactive map portal that would allow them to discover whether a property is exposed to

flooding or has flooded in the past. In addition, participants noted that there is no legal obligation for sellers to disclose property-level flood risk, which deprives potential buyers of essential information to assess the risk. Flood risk communication is doubly important in the absence of this information, because people need to know and appreciate the threat of flooding before they will take protective actions.

In Ontario, conservation authorities play an important role in flood risk communication by informing and educating the public about flooding, as well as conducting flood forecasting, mapping flood areas and issuing warnings.

iv. Difficulty in evaluation

As with all public initiatives, it is critical to find ways to measure whether flood risk communication is making a difference, so that approaches can be adjusted if necessary. Many participants commented on the difficulty of evaluating flood risk communication programs, including messaging and broader public outreach campaigns. However, the group discussions revealed potential indicators for evaluating effectiveness, including:

- uptake of financial incentive programs related to flooding at the municipal level, such as backwater valve credits or rain barrel programs;
- number of residents accepting flood resiliency services;
- number of home adaptation audits completed in a community;

- number of subscribers to real-time alert notification programs; and
- number of homes with overland insurance policies and claims.

In addition, participants identified a range of methods that could be used to measure the effectiveness of flood risk communication programs, including:

- a survey via social media every two years to learn what people know about their flood risk and what actions they have taken;
- in-person surveys at community events;
- analyzing logs of calls and inquiries to emergency services departments related to flooding; and
- collecting public engagement data (i.e., number of clicks and comments) on flood communication via social media and other relevant websites.



Conclusion

Individual Canadians play an important role in managing flood risk, including adopting property-level protection measures and preparing for flood emergencies. To advance Canadians' awareness of their flood risk and how to prepare and respond, organizations conducting flood risk communication, including public education and outreach campaigns, are encouraged to consider applying the principles of effective flood risk communication presented in this document.

