Floods: Considerations for Policymaking

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Presentation Narrative

Flood Disasters and Mitigation: Analysis of a Complex Problem

My name is Vanessa Bissonnette. I am supported by a team and would like to acknowledge that listening in and available for questions includes Stephanie Anctil, Elizabeth Clarke, Andrée Mongeon and Kevin Woodley.

The purpose of this briefing is to break down the principal issues defining the problem of flood disasters as well as mitigation of those disasters in Canada. We will address (1) causes and impacts, (2) exacerbating factors, and, (3) the policy environment. We hope to frame the issue for the Minister, in terms that may inform your policy direction and program planning.

As a starting point, we would like to position the problem flood disasters AND mitigation in Canada as a "wicked problem."

Horst Rittel who coined the term "wicked problem" in the mid-1960's defined this term in the area of policy and planning as being a problem that is difficult or impossible to solve because of incomplete, contradictory, and changing requirements that are often difficult to recognize. It refers to a problem that cannot be fixed, where there is no single solution to the problem. Moreover, because of complex interdependencies, the effort to solve one aspect of a wicked problem may reveal or create other problems.

We have divided our presentation into two parts.

Part-1 aims to break-down the problem:

(1) Define the scope of the problem.

(2) Consider exacerbating factors.

(3) Highlight inequities

(4) Review governance issues

(5) Overview Federal costs.

We will then move to Part-2 in which we an analysis analyze the possible actions:

1. Explore the complexity

- How well is Canada managing.
- Why is this complicated?

2. Recommendations

Finally, we will end with recommendations for the Minister.

Flooding is the most frequent natural disaster in the world, accounting for almost half of natural disaster occurrences between 1998-2017. The same is true in Canada, floods are the most frequent natural disaster. In the previous decade, there have been 108 flood disaster events, three times the number of wildfires. In our country, flooding mostly occurs when water volume in a river or stream exceeds the channel capacity. Major triggers are snowmelt runoffs and ice jams, summer storms and winter downpours, rising groundwater and glacial melting resulting in an overflow of a glacial lake.

The picture is not complete without speaking to the loss to human life and health with long-term implications, which cannot be costed.

In addition to significant economic impacts, flood disasters result in a number of immediate and longer-term human (and animal) health impacts:

In the short term: drowning and physical injuries; carbon monoxide poisoning which may occur during power outages.

There are also less obvious impacts including diseases from drinking contaminated water, building damage from sewer backup, mold damage, and insect proliferation from still water breeding sites. In addition, there is an on mental health including anxiety, fear, trauma,

depression, among others. Combined and added to financial loss, results in significant socio-economic and cultural impacts.

Poor land-use and urban planning, improper zoning of development:

The Indigenous Peoples of this land knew where *not to build*, but by virtue of how our country was colonized 80% of Canadian cities are built on flood plains.

Governments – especially at the local level, know that areas within their control are susceptible to flooding. Yet, residential and commercial development continue to occur – largely unimpeded, within flood zones.

Are developers *truly unimpeded* when building? Apparently – yes.

Most building codes in Canada are outdated! For example --

No specs on how concrete is mixed to withstand storm water, no requirement to install sump pits with pumps or generators to back-up those pumps during an outage, no call for mechanical backflow prevention devices build into plumbing and no requirement to elevate from low basements key electrical building components such furnaces > water heaters > electrical panels.

And do people *really, know full well* they are investing in a flood zone? [Poor flood maps]

How reliable are the tools that allow people to predict, and therefore mitigate loss from flood emergencies? Apparently – not so good.

A recent evaluation of flood maps for Canadian municipalities indicated that most (62%) were of low quality and surveys of Canadians living in designated flood zones have shown that only 6% know they are at risk.

And what of poor infrastructure?

Over 75% of Disaster Financial Assistance Arrangements are applied to restore public infrastructure.

And, we are now seeing class-action lawsuits filed by residents against their government for failures in public infrastructure --

- Five cities in various provinces (Ontario, British-Columbia, Newfoundland) have been sued for urban storm water / sewer systems that failed.
- Four First Nations were awarded a $90M settlement for damages when a province (Manitoba) was judged negligent in its operation of water-control structures.

Class actions suits like these would likely not occur, if damages were covered by insurance. [No insurance available]

The Journal of Flood-Risk Management reports – I quote

"The majority of Canadian homeowners are not insured for damages caused by groundwater flooding (infiltration) and overland flooding (seeping)."

Finally, floods are made worse in – [Poor access]

Places that cannot be accessed by road and have limited resources to respond to emergencies.

For many of the reasons covered on the previous slide: flood disasters are devastating to Indigenous communities, especially those living in remote areas.

We have linked EM of flood-disasters to Reconciliation. In our research, many experts are raising the alarm on the issue of flood-disasters. Every mandate letter contains a direction to – I quote "determine what Ministers can do in their specific portfolio to accelerate and build on the progress made with First Nations, Inuit and Métis Peoples."

As an example, the First Nation of Keshechewan, in northern ON. The community was formed by Federal decree in 1957, when Cree hunters were forced to settle on a floodplain. In an 11 year study by the U of Guelph, it was found Keshechewan had been evacuated six times. In one instance, 500 evacuees were still displaced two years later. In addition to power-outages, sewer back-up, water contamination and school closure due to mold abatement; the community of Keshechewan continues to manage trauma from family separation, severe depression and increasing rates of child-suicide. More than 20 years after the original promise from the Crown, last year Keshechewan signed for a third time – an agreement with the Federal and Ontario Governments that sets the framework for the community's relocation.

Minister, I work for the CER and have seen the power of story first-hand. I would love to take that call to action, and work differently as a Federal Public Servant – to brief you differently. To tell you a story. The story of the northern Cree nation of Keshechewan, which is powerful illustration of what I just said and is heartbreaking.

While the politicians and media celebrated, Chief Leo Friday of Keshechewan had this to say:

-- "It's something that I signed two times already and this is the third time. And that's why I'm scared, I'm in a terrible confusion right now."

Minister, your Department hosts the Disaster Risk Reduction National Roundtable, every year.

In the last two iterations of the roundtable (2017/18) there were break-out sessions tackling the issue of Indigenous Emergency Management.

Experts said:

Indigenous communities are uniquely impacted by disasters, as these events add to existing trauma.

First Nations peoples are evacuated from communities at a much higher rate than other populations in Canada.

It is important to go beyond procedural evacuation issues to address humanistic, psycho-social issues – noting that many Indigenous evacuees experience cultural dislocation when moved to urban environments – they, and their children have to basically re-learn how to live.

It is important to see climate change impacts on Indigenous communities in the North, and co-develop EM strategies that account for public infrastructure that is already well-below standard.

The whole-of-society cost of responding to climate change impacts - including managing flood disasters, is estimated to increase form a $5 Billion annual average to upwards of $43 Billion by 2050.

(Source: National Roundtable on the Environment and the Economy, funded by Canada.)

In terms of federal budget implications, we can determine what has been spent on the back-end of the EM cycle – for flood disaster relief, response and recovery.

Since 1970, the federal program Disaster Financial Assistance Arrangements (DFAA, for short) have transferred $4.1 Billion to Provinces and Territories, and we know that flood-disasters account for two-thirds of those payments.

In 2016, the Parliamentary Budget Officer published a report that estimated the Average Annual Cost for DFAA due to weather events and determined that flood disasters could be expected to result – on average to $673M of transfer payments every year.

The only recent program solely devoted to flood hazard mitigation was the National Disaster Mitigation Program (NDMP, a federal program) which included a cost-shared component with Provinces/Territories/Indigenous partners. It ran for 5 years, closing earlier in 2020. Spending $95M (only half of its allotted budget).

Emergency Management [*again, for all-hazards] as a core responsibility is financed with a budget that is set to increase by more than 40% in 2022 – $514.6M. In contrast, provinces finance EM variably, from $650K in Newfoundland to $566M spent last year in Alberta.

COMMUNITY EM PREPAREDNESS FUND (BC)	$ 69.5 M
EM FLOOD DAMAGE REDUCTION (SK)	$ 2.5 M
FLOOD PREPAREDNESS PROGRAM (MN)	$ 18.2 M
CONSERVATION AUTHORITIES (ON) *	$ 7.4 M
FLOOD MITIGATION MEASURES (QC)	$ 473 M
FLOOD RISK INFRASTRUCTURE (NS)	$ 0.67 M

Atlantic provinces:

Prince Edward Island's Emergency Measures Organization	$0.65 M
Nova Scotia's Emergency Management Office	$2.2 M
New Brunswick's Emergency Measures Organization	$3.4 M

We did not dive-deep in our EVALUATION of federal intervention, but we can highlight the areas of challenge and shortcomings found in our research.

I am borrowing the strong-language found in an article appearing in the journal The Conversation, July 2019.

CANADA'S PATCH-WORK QUILT

Despite PSC efforts to lead and coordinate through governance mechanisms, many experts agree that "flood management in Canada is rife with co-ordination problems."

CANADA'S FREE-RIDER PROBLEM

"Municipalities control what gets built and where, enjoying the permit fees and property tax revenue from those decisions, but do not directly fund disaster assistance when catastrophe strikes. Instead, the provincial and federal governments do."

Studies of small business suggest it may be more effective to focus on measures to improve insurance penetration rather than providing compensation for losses.

Surveys of homeowners reveal – I quote

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"*Canadians support the idea of flood insurance as a means of recovery, but show little demand or willingness to pay for coverage. Consequently, consumer demand for flood insurance may be insufficient for economic viability in Canada."* (Operating on Flawed Assumptions, September 2017)

Why is a solution complicated?

Flood maps are controversial.

Surveys reveal that an overwhelming majority (90%) of homeowners think flood maps should be made public, sellers of property should be required to disclose floor-risk and property owners should (somehow) be notified if their home is located in a flood zone.

There are vested and conflicting interests at play when a map is published as authoritative and used in zoning, with regulatory policy and market implications.

To illustrate --

In summer of 2019, the QC GOV released a series of updated flood maps for the province.

You are looking at a flood map of Dorval; the bustling residential, commercial and industrial area abutting the airport.

The orange marks the 'special intervention zone' – which, by QC decree means the homeowner may no longer obtain a permit for home repairs >certain flood events.

The orange is the map BEFORE public consultations – which according to news reports, involved angry crowds and police presence at a number of town halls.

The purple is the map AFTER public consultation. What changed: the science or the politics?

People are overconfident

Surveys reveal that Canadians' self-assessment of flood risk does not align with actual risk: 74% do not think they are vulnerable to flooding, despite living in areas designated as flood zones.

Infrastructure mitigation is a hard sell

The Netherlands, where two-thirds of the country is prone to flooding and 70% of the gross-national-product is earned below sea level, sets aside $2.5 Billion every year to 'water defense' for managing systems of dykes, pumping stations, canals and drainage structures.

Many studies have shown that physical mitigation measures offer significant returns on investment.

For every $1 invested in mitigation, $7 to $10 can be saved in post-disaster recovery costs.

However –

Nearly half (47%) of Canadians perceive that flooding will not increase in future, and do not, therefore perceive an urgent problem to address.

In fact, half (49%) of Canadians perceive water management infrastructure is solid in Canada, with no further investment required.

Regulatory mitigation is risky.

There are likely any number of legislative interventions needed by the Federal government:

Harmonized construction standards through updates to the National Building Code of Canada

A modernized Canada Water Act which establishes clear responsibilities for flood disaster mitigation

Revised Guidelines / Terms and conditions for the DFAAs (SPELL OUT ACRONYM)

Modified mortgage rules – etc. Everyone one complex and contentious.

Flood maps inform …

urban development

infrastructure investment

private real-estate

insurance product pricing or even, availability

building design – as well, as supporting disaster EM with on-the-ground intelligence.

Surveys also show that – I quote:

"While most Canadians are ready to take on a greater role in flood protection (83% think people should take steps to protect their own property), despite this sense of duty, only 30% of Canadians are taking action to protect their property from flooding."

To illustrate the risks of regulatory intervention –

Last year, a CBC journalist (Chris Arsenault) obtained and quoted a high-level brief destined to the Infrastructure Canada DM, it said:

"The development of building and infrastructure codes and guidelines in this country is a somewhat ponderous process."

The journalist went on to describe …

"Canada's construction industry is worth $171 billion a year and employs more than 1.2 million people. It also consumes 40% of the country's energy and 50% of its primary resources. Getting the new building code right will require a balancing act." – Canada's Building Code is getting a climate change rewrite, CBC April 2019

We have some recommendations for the Minister of Public Safety Canada.

Limit your involvement in flood maps. Their completion and promotion. Flood maps are a tool in flood-disaster mitigation, preparedness and coordinated response but not the complete solution.

Be active in the creation of the Canada Water Agency. Partner with Environment Climate Change Canada, to modernize the Canada Water Act so that you may ensure the mandate of the *new* Agency addresses issues of flood disasters and remains focused on mitigation solutions.

Leverage programs to encourage mitigation. Continue to build-on recommendations from past program audits and evaluation. Consider changing the terms and conditions of the Disaster Financial Assistance Arrangements to incentivize and better align with the guiding principles applied by the former federal Flood Damage Reduction Program (1976-1995).

Partner with insurance industry. Explore and co-develop with the CMHC and the Insurance Bureau of Canada, a public-private re-insurance framework. Join industry-backed research institutions in their public education ventures.

Build-on other countries' successes. Leverage the experience and expertise of countries that have been adept at addressing facets of flood disaster and mitigation, such as:

The Dutch, mentioned earlier, that treat water defense much like national defense.

Countries like France, Belgium, Denmark, Spain and New Zealand who work with insurers to offer state-backed bundled insurance for natural disasters.

The US Weather Service that is reinventing itself as a one-stop-shop for science-driven 'decision support service' for climate change adaptation

The State of Louisiana that published a comprehensive, phased plan to relocate vulnerable populations from the oceanfront.

Flood Damage Reduction Program was assessed as – I quote: "extremely successful in redirecting damage-prone development away from flood-risk areas."

There is an opportunity for Canada to reaffirm its realm of expertise by authenticating, store housing and making public usable, aggregate or granular forms of the full suite of data that informs the development of flood maps and underpins climate change adaptation. We believe this work is ill-suited to your department.