Local Adaptation in Canada

SYNTHESIS REPORT | JUNE 2019

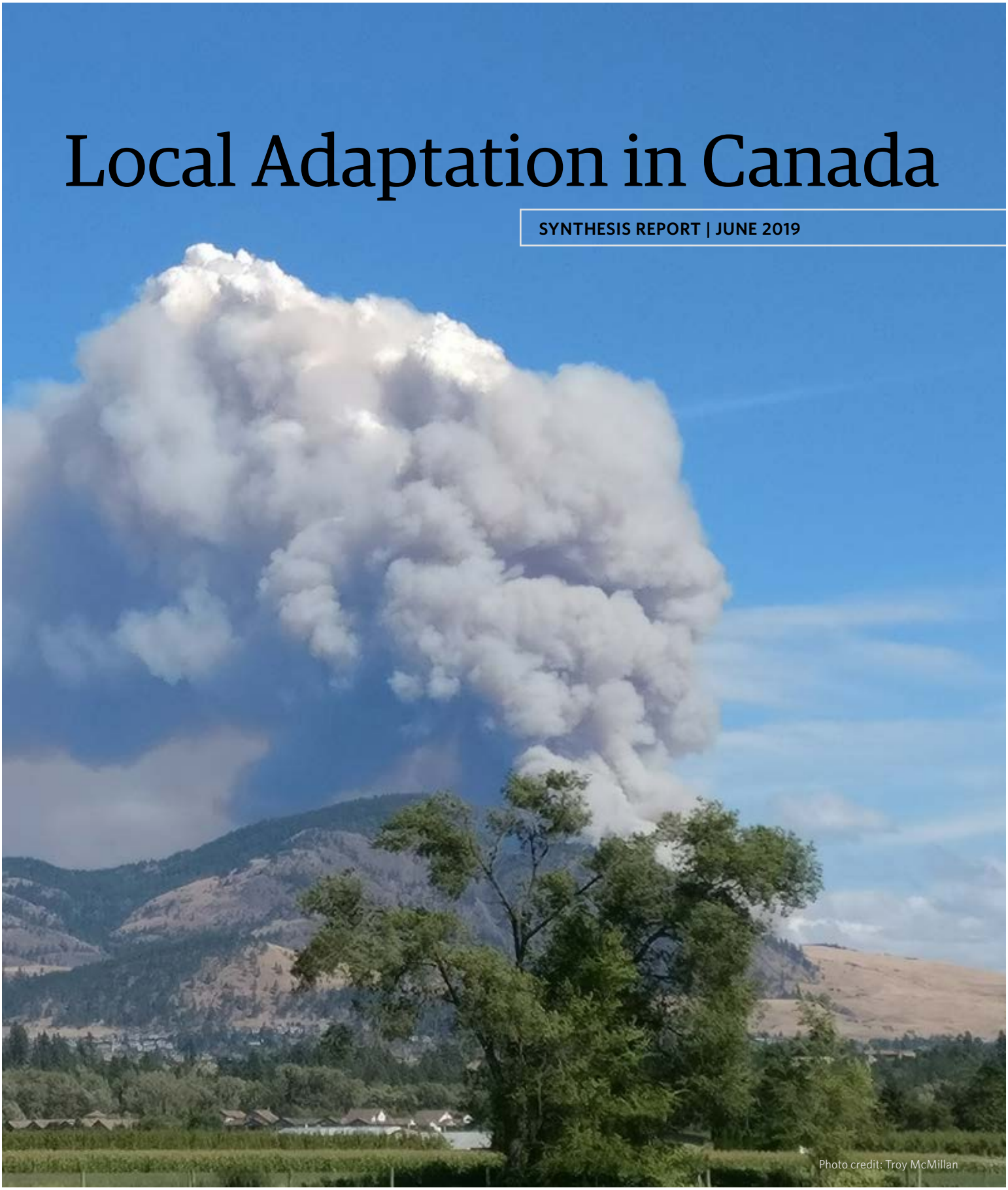

Photo credit: Troy McMillan

A collaboration between the Federation of Canadian Municipalities, the University of British Columbia, and the University of Waterloo

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Climate Change Adaptation

In October 2018, the United Nations Intergovernmental Panel on Climate Change (IPCC) released its most urgent report to date, stating that the global community may have as little as 10 to 12 years to slow greenhouse gas emissions and limit global temperature increase to 1.5°C.

Canada is now dealing with the effects of climate change. For some communities, longer drought seasons restrict water and agricultural resources and increase the risk of forest fires. Warmer winters in the North means more permafrost melt and less ice, leading to transportation and building challenges. Many communities are also contending with the damage caused by more frequent and intense storms.

Canada's economic wellbeing depends on adapting vital infrastructure to this new reality. Local governments have a key role to play in helping the federal government meet its climate goals. Canada's municipalities influence, directly or indirectly, half of the country's greenhouse gas emissions, and major portions of physical and natural infrastructure that are susceptible to changes in the climate. They are also key to engaging and mobilizing their communities to respond including residents and businesses. Adaptation is a community-wide effort.

Local governments can use adaptation planning, together with discrete adaptation and mitigation measures, to address infrastructure issues and make more informed long-term decisions. Adaptation planning is designed to reduce the negative impacts of climate change-related events that may take place, and to take advantage of cost, resource, and other benefits that accrue regardless of whether or not the event occurs in the future.

Cover photo: A plume of smoke rises above the southern British Columbia community of Joe Rich during the 2017 wildfire season. (Credit: Troy McMillan)

MOST EXPENSIVE NATURAL DISASTERS IN RECENT CANADIAN HISTORY

Fort McMurray wildfires	2016	$3.6 billion
Southern Alberta flooding	2013	$1.72 billion
Ice Storm, Ontario-Quebec	1998	$1.49 billion

Sources: Insurance Bureau of Canada, Seafirst Insurance Company

2018 Climate Change Adaptation Survey

This document synthesizes the findings of the 2018 Climate Change Adaptation Survey of Canadian municipalities.

The survey ran from January to April 2018 and was conducted by FCM, the Centre for Environmental Assessment Research, University of British Columbia, and the Faculty of Environment, University of Waterloo. It built upon an earlier survey conducted in 2012 by the National Municipal Adaptation Project.

The 2018 survey provides a snapshot of municipal adaptation planning. Its findings are not meant to be representative of the entire Canadian municipal sector and, as with this type of survey, participants' responses can be influenced by their perceptions. A direct comparison between the 2012 and 2018 data—particularly as it relates to climate-induced events—was not possible due to differences in the survey outline and method.

The full methodology and more detailed results can be found in our accompanying Summary Report.

Photo: Ryan L. C. Quan

Survey Snapshot

- Over the last 10 years, local governments report that above-average rain and snowfall, and more severe storms are the most frequent weather events in their communities.
- More than half of local governments surveyed have initiated formal adaptation planning discussions in their community within the last four years.
- Municipal engineering and public works, planning, and non-traditional departments such as emergency management and public safety, play an increasingly important role in adaptation planning.
- Results show that adaptation planning is more often undertaken on an as-needed basis, such as for infrastructure projects or risk assessments, than as part of a broader plan or strategy.
- Very few local governments have one or more full-time staff dedicated to adaptation planning or related initiatives.
- Local governments are increasingly using climate change and other data to make adaptation-related decisions.
- Local governments see the connections between adaptation planning and emergency management and disaster response, but struggle to take action because of a lack of human and financial resources.
- FCM, provincial and territorial governments, and the federal government are seen as the main sources for municipal adaptation planning and implementation funding, and for information and training resources that support adaptation.

Forest fire scarred landscape near Rock Creek, BC. In some parts of Canada forest fire risk will increase with changing environmental conditions. Preparation and new approaches to planning will be required to protect communities. Photo, K. Hanna

Detailed Results Summary

Geography and Population

Of the 180 respondents that completed the survey, about 70 of them had done some type of adaptation planning. Responses by province and territory loosely followed population densities. Ontario, Quebec, British Columbia and Alberta represented over 63.5% of the completed surveys. Mid-to-large size communities (10,000+) made up 64% of all respondents (53% in 2012). Twenty-one communities in the 2018 survey had populations over 500,000 compared with 15 communities in 2012.

Climate Change Impacts

Collectively, respondents reported close to 800 events that had impacted their communities over the last 10 years. The contrast of permafrost melt—no change in ranking between 2012 and 2018—and a decrease in severe cold periods—from 5th in 2012 to 10th in 2018—speaks to a warming climate in the Canadian South, and to the geographical weighting of respondents, i.e., more respondents from the South than the North.

MOST FREQUENTLY REPORTED CLIMATE CHANGE IMPACTS, CURRENT (2018) AND EXPECTED (2028)

Impacts or Events	Rank (over last decade)	Rank (expected between now and 2028)	# selecting event
High rain or snowfall, above the annual normal.	1	2	118 (15%)
Increased severe storm events (high wind, etc.).	2	1	106 (14%)
Flood requiring significant or uncommon protection measures, or causing significant damage to public and private property.	3	3	101 (13%)
Invasive species (insects, plants, etc.).	4	4	80 (10%)
Severe cold periods, for a prolonged period of time, below the seasonal normal.	5	10	71 (9%)
High temperatures for a prolonged period of time, above the seasonal normal.	6	5	70 (9%)
Other severe weather-related event or events that have resulted in significant damage to public and private property.	7	8	59 (8%)
Drought requiring significant or uncommon water restrictions.	8	6	50 (6%)
Climate-related change to vegetation or animal populations (loss of natural vegetation, change in migration patterns, etc.)	9	7	46 (6%)
Human health-related (heat stress, smog, etc.)	10	9	43 (6%)
A forest fire that resulted in evacuations or an evacuation alert.	11	11	13 (2%)
Other (please specify).	12	13	11 (1%)
A forest fire that resulted in damage to buildings or other infrastructure	13	12	8 (1%)
Permafrost melt	14	14	4 (0.5%)

The three most extreme events or impacts over the past decade were ranked as high rain or snowfall, above the annual normal; increased severe storm events; and flooding requiring significant or uncommon protection measures, or causing significant damage to public and private property.

When asked about future climate change impacts of concern, respondents identified the same three but in a slightly different order: increased storm events, above normal precipitation, and significant flooding.

Of the eight local governments in Nova Scotia that completed the survey, six reported uncommon flood events over the last 10 years. Similar numbers were reported in New Brunswick—9 of 14 local governments—and Newfoundland Labrador—with 10 of 17 reporting.

Of the 44 local governments in Ontario surveyed, 32 reported above-average snow or rainfall, and 30 reported uncommon flood events. Local governments in BC and Alberta were more likely to report significant drought events.

Local governments in forest-rich British Columbia, Ontario and Quebec reported higher instances of invasive species, such as the mountain pine beetle and emerald ash borer, than local governments in other provinces. Both insects have had devastating impacts on the forestry industry and forest ecosystems.

Adaptation Planning in Local Governments

Fifty-seven per cent of respondents indicated that formal adaptation planning discussions began in their community within the last four years; 40% had started these discussions between 2000 and 2013; and three started before 2000.

Of the communities that had some form of adaptation planning, almost 20% were in the midst of developing a plan; 14% were implementing the plan; and about 11% had incorporated adaptation measures into a plan, but had no specific adaptation strategy or plan.

In 2012 and in 2018, the most highly ranked types of adaptation actions were those that involved infrastructure improvements, and conducting risk management assessments.

Lead Departments

Almost half of respondents with adaptation plans (46%) said that their Planning or Environment department led their adaptation efforts. In 2012, 56% reported these two departments as leading their adaptation efforts.

Engineering / Public Works was the third most cited function at 17%, up from about 10% in 2012. Engineering / Public Works, Planning, and Public Safety were the three most popular support departments (18%, 15%, and 13% respectively). This could suggest that adaptation responses may be becoming more technical in nature, and that local governments are recognizing the role of non-traditional departments in adaptation planning.

Planning and Implementation

FCM and Engineers Canada were the top two sources for information about adaptation planning and implementation, followed by university/ research hubs and NGOs. Other sources included planning consultants, municipal associations, utilities, community groups, and federal government departments.

Housing in Cambridge Bay, Nunavut. Climate change and adaption poses unique challenges for Canada's north. New approaches to construction are needed to respond to changing environments. Photo. K. Hanna

Conclusions and Next Steps

Despite mounting evidence of the benefits of adaptation planning, the 2018 survey indicates that more work needs to be done to enable local government to undertake the necessary steps to plan for climate change impacts.

A survey of 63 Canadian municipalities was conducted by the University of Waterloo in 2017 and found similar results. Only a minority had assessed their community's vulnerability to specific climate change impacts, and of those communities with plans that consider adaptation, only a few had assessed the impacts of climate change on specific neighbourhoods and industries.

There are bright spots. Local governments are increasingly using real-time and historical data—weather, climate, energy, water, etc.—on a regular basis to make better informed decisions about current and future projects. Our survey respondents also highlighted the connections between climate change adaptation measures and public safety, disaster management, and risk assessment.

The full summary report for the 2018 Local Adaptation in Canada survey identifies several research areas that could improve future analyses of adaptation trends, nationally and regionally. Among these would be to conduct the survey more regularly; outline the economic and other benefits local governments have found in implementing adaptation and/or mitigation measures; and identify ways of improving links between adaptation and other sustainability efforts.

FOR MORE INFORMATION:

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