Photo: NDMP

3.3 NATIONAL DISASTER MITIGATION PROGRAM OUTCOMES IN BC

June 2022

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RESILIENCE PATHWAYS

CO-CREATING NEW KNOWLEDGE FOR UNDERSTANDING RISK AND RESILIENCE IN BC

This article is part of the Resilience Pathways Report. The report has the following objectives: a) to share knowledge about existing practices and recent advances in understanding and managing disaster and climate risk in BC, including some information on relevant federal programs, and b) to provide insights on gaps and recommendations that will help build pathways to resilience in BC.

This article belongs to *Chapter 3 Climate and Disaster Risk Management: Enabling Action*. To read all articles in the report, see DRRPathways.ca.

The Resilience Pathways Report is a project of Natural Resources Canada.

3.3 NATIONAL DISASTER MITIGATION PROGRAM OUTCOMES IN BC

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ABOUT THE NATIONAL DISASTER MITIGATION PROGRAM (NDMP)

The National Disaster Mitigation Program (NDMP) is the foundation for informed mitigation investments that could reduce, or even negate, the effects of flood events. The NDMP fills a critical gap in Canada's ability to effectively mitigate, prepare for, respond to, and recover from flood-related events by building a body of knowledge on flood risks in Canada and investing in key flood mitigation activities. Knowledge that is up to date and accessible will not only assist governments, communities and individuals to understand flood risks and employ effective mitigation strategies to reduce the impacts of flooding but will also further discussions on developing a residential flood insurance market in Canada.

The program was established as part of the Government of Canada's commitment to building safer and more resilient communities. Budget 2014 earmarked $200 million dollars (from 2015 to 2020) to support this new program. In light of the ongoing need for risk mitigation investments in Canada and a number of provinces and territories advocating for an extension of the NDMP, the Economic and Fiscal Snapshot 2020 earmarked funding for NDMP renewal for two additional years (2020 to 2022). There are four funding streams under the NDMP:

1. **Risk Assessments** – This stream provides funding for the completion of risk assessments to inform flood risks. Risk assessments are the foundational step in disaster risk mitigation; they identify flood hazards, potential impacts, and community and infrastructure vulnerabilities as well as the overall flood risk profile for the area.

2. **Flood Mapping** – This stream provides funding for the development and/or modernization of flood maps. A flood map identifies the boundaries of a potential flood event based on type and likelihood, and it can be used to help identify the specific impacts of a flood event on structures, people and other assets.

3. **Mitigation Planning** – This stream provides funding for the development and/or modernization of mitigation plans to address flood risks. A comprehensive mitigation plan allows applicants to develop realistic and sustainable mitigation solutions by clearly outlining the plan's objectives, key activities,

expected outputs, timelines, and roles and responsibilities.

4. **Investments in Non-structural and Small-Scale Structural Mitigation Projects** – This stream provides funding for other non-structural and small-scale structural risk mitigation projects. Eligible projects would include actions such as the replacement of storm culverts, or would improve flood resilience by proactively preventing or mitigating damages and losses.

From 2015 to 2022, the NDMP funded 460 projects across Canada, including 132 in BC, and contributed to an increase of communities that undertook mitigation investments to reduce their vulnerability to disasters. The program helped small, rural communities and municipalities (median population size of recipient communities is 18,000) in mitigating the social and economic impacts of floods; it funded communities with higher representations of vulnerable populations, such as seniors and Indigenous people, and its sequential stream approach provided the prerequisites to develop a residential flood insurance market in Canada.

Flooding is the most common natural hazard affecting Canadian communities, and among the most costly.[1] Between 2008 and 2018, the Canada Disaster Database recorded 170 major disasters resulting in tens of billions of dollars in damages; of these, 108 were flood-related events, including flooding from major storms. Since 1970, the Government of Canada has paid out an estimated $8.5 billion dollars in post-disaster assistance through the federal Disaster Financial Assistance Arrangements (DFAA) to assist provinces and territories with response and recovery costs. Of these costs, 97% occurred in the past 25 years, and more than one-third occurred in the past six years alone, which indicates that disasters are increasing in both frequency and cost. This is due to the growth of population and assets. Canada's population has grown by 80% since 1970 and many of the assets are built on floodplains. The increase can also be attributed to climate change to some extent. Flooding now accounts for nearly 75% of DFAA events and two-thirds of all DFAA payments.

ALIGNMENT WITH THE SENDAI FRAMEWORK

The NDMP was informed by, and seeks to align with, the *Sendai Framework for Disaster Risk Reduction 2015–2030*, which advocates for a substantial reduction of disaster risk and losses in lives, livelihoods and health as well as in economic, physical, social, cultural and environmental assets of persons, businesses, communities and countries. The NDMP is divided into four funding streams that seek to both address and operationalize the Sendai Framework's four action priorities.

Stream 1 (Risk Assessments) and Stream 2 (Flood Mapping) align with Sendai Framework Priority 1, *Understanding disaster risk*, by developing an understanding of disaster risk in the various dimensions of vulnerability, capacity, exposure of persons and assets, hazard characteristics, and the environment. Stream 3 (Mitigation Planning) is informed by Priority 2, *Strengthening disaster risk governance to manage disaster risk*, and Priority 4, *Enhancing disaster preparedness for effective response and to "Build Back Better" in recovery, rehabilitation, and reconstruction*. Stream 4 (Investments in Non-structural and Small Scale Structural Mitigation Projects) directly relates to Priority 3, *Investing in disaster risk reduction for resilience*, by providing public investment in disaster risk prevention and reduction through structural and non-structural measures.

The NDMP incorporates the guiding principles of the Sendai Framework, which recognizes the shared responsibility between governments, sectors and stakeholders, through its cost-sharing mechanism with provinces and territories, in addition to recognizing the primary responsibility of the federal government in preventing and reducing disaster risk. The program empowers local authorities and communities by funding the development of resources, providing incentives, and helping to inform decision making. The NDMP further encourages stakeholder and public engagement from across society, providing eligible funds for workshops and consultations as well as national public awareness and engagement activities to advance the discussion on overland flood insurance.

NDMP'S EFFECT ON PRACTICE

The following discussion is informed by a desktop document review, interviews with NDMP recipients, and input from the Province of BC, focusing on qualitative data. The desktop document review considered corporate, policy and program documents, and public reports. Four semi-structured interviews were conducted with representatives or recipients of six NDMP projects: Okanagan Basin Water Board, Cowichan Valley Regional District, Fraser Basin Council, and Capital Regional District (note that some entities had more than one project). The cross-section of representatives included directors and project managers, providing important perspectives on outcomes and outputs of the NDMP at local and regional levels. In addition, Public Safety Canada sought input from Emergency Management BC, which works closely with the department to administer the NDMP across the province. This report seeks to fill an identified limitation in the standard national evaluation of the NDMP, which does not involve communities directly. Public Safety Canada typically works in collaboration with counterparts in provincial or territorial governments rather than the communities benefiting from NDMP project funding.

Overall, there was consensus among recipients that the NDMP projects met the objectives of being able to effectively mitigate, prepare for, respond to, and recover from flood-related events by building a body of knowledge on flood risks in Canada, and by investing in foundational flood mitigation activities. As many of the projects undertaken by recipients fell under Streams 1, 2 and 3, no direct quantitative data was collected to determine how the recipient projects have reduced the impacts of disasters on area residents. However, interviewees indicated that the work completed through NDMP projects has contributed to reducing disaster impacts and greatly improved disaster planning and mitigation (Figure 1).

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INFORMATION PRODUCTS

A number of the recipients stated that they were satisfied with the information products (e.g., maps, reports, assessments) that were developed with NDMP funding. These information products have led to a better understanding of local and regional flood risk and have highlighted major gaps in flood management. Maps, in particular, have been incorporated into local government planning and public websites, contributing to an increase in available information at the local level, technical analysis, and informing policy decisions for a long-term flood strategy. The Capital Regional District noted the importance of translating the technical reports into more "public-friendly" material, including summary documents with key findings. These products have played an important role in informing inter-municipal networks and provincial agencies. The Cowichan Valley Regional District indicated that the outputs of the program are now informing the Province of BC's approval process for land-use products and the maintenance of infrastructure.

All of the project funding secured by the Fraser Basin Council relates to a multi-year initiative for the Lower Mainland Flood Strategy. The Fraser Basin Council noted that the hydraulic model was used by the City of Chilliwack to model dike scenarios and develop flood bylaws to reduce flood risks. Similarly, Cowichan Valley Regional District's tools have been translated into planning and development procedures, including public communications, bylaws, and permits. Okanagan Basin Water Board notes that the central Okanagan is now able to conduct non-structural flood mitigation planning based on the results of the mapping. Now that the project outputs and tools are available for long-term use, they have begun

Figure 1: Construction of a new pump station (Photo: NDMP).

to foster improved land management and building practices.

Final products were shared widely within municipalities and among government officials and staff, Chiefs and councillors, and emergency managers. The Fraser Basin Council established joint committees between managers, practitioners, and representatives from local governments as well as project specific advisory committees. The modelling and reports were made available to the public, and the Fraser Basin Council interviewee highlighted the importance of developing an executive summary, digital presentations, FAQ material, and other background documents with plain language and simplified terminology to ensure the information was accessible. All participating organizations were informed that the outputs and maps were available for their use.

STAKEHOLDER ENGAGEMENT

All six interviewees indicated that they sought to encourage and incorporate a high level of stakeholder engagement and collaboration in their NDMP projects. While the NDMP does not mandate the creation of stakeholder networks, it does encourage the use of new and existing networks to accommodate the project needs. For example, the Fraser Basin Council noted challenges in capacity and technical expertise that made the ability to participate in this particular project challenging, so it set up data-sharing agreements to manage and track the use of GIS maps and modelling.

All of the recipients interviewed recognized the work accomplished to date to engage First Nations, though they also acknowledged the ongoing need for continuous engagement. Indigenous input through workshops, stakeholder committees, and working group meetings has informed priorities and the direction of the projects. For example, the Fraser Basin Council helped establish an emergency planning secretariat based on a community member's suggestion, which was then led by an Indigenous organization to support and promote Indigenous engagement for the Lower Mainland Flood Strategy. The Okanagan Basin Water Board noted that local Indigenous communities contributed to the knowledge base of historical flooding in the region.

The Capital Regional District indicated that involving the public, elected officials, and municipal staff in its NDMP projects raised the public profile of flood preparedness. Local elected officials and municipal staff learned that they have the responsibility to prepare for, and build the capacity for, flood events and emergencies. The project highlighted impacts of potential flood events and prompted policy decisions.

REGIONAL SCALE, FUNDING, AND FOCUS

A key advantage of the NDMP is that it provides an opportunity for communities to receive funding for regional projects and tools. The Fraser Basin Council and Capital

Regional District highlighted the importance of regional cooperation in the development of these types of projects, as it can be helpful to smaller communities that may not have the resources—including funds, staff, and project management expertise—to complete substantial mitigation work independently. NDMP funding enables a regional scope to help develop context-driven tools within local areas and facilitate greater relationship building between municipalities and communities. This helps to create knowledge and foster long-term strategic planning, which is important as emergency management staff are often preoccupied with other incidents or events.

The Fraser Basin Council and Capital Regional District highlighted the importance of regional cooperation in the development of [NDMP-funded] projects, as it can be helpful to smaller communities that may not have the resources . . . to complete substantial mitigation work independently.

The majority of the projects that were managed by the interviewees for this report fell into the Stream 1 and 2 categories, which may affect the responses received. For example, while NDMP funding informed planning efforts as a result of the assessment and mapping stages, it is difficult to determine the value of reduced disaster-related financial liabilities for municipal, provincial or federal governments (the objective of the NDMP).[2] However, the recipients overwhelmingly stated that their projects contributed towards reducing financial liabilities, as these projects triggered policy work and decision making at the municipal level which is effecting changes to future developments and spin-off projects.

NDMP recipients emphasized that the focus of the NDMP on flood-related disaster and mitigation planning and the integrated approach to flood risk management (i.e., the varied funding streams and breadth of eligible projects) was positive. However, they also called for an all-hazards approach to the program to recognize disasters beyond floods. The recipients acknowledged alternative funding sources,[3] such as the UBCM Community Emergency Preparedness Fund or the Disaster Mitigation and Adaptation Fund from Infrastructure Canada. Even so, the NDMP was noted as possessing numerous advantages, such as being better suited to the proposed projects and possessing a larger pool of available funding. In addition, it was noted that as a result of provincial caps, current funding earmarked for risk mitigation at the provincial level is not sufficient. Nearly all recipients interviewed asserted that they would have been unable to complete their respective projects without funds through the NDMP, given the lack of a comparable alternative. Interviewees further stated that they hoped to receive future NDMP funding to continue the work funded to date.

INDIGENOUS PARTICIPATION

Program recipients present at each interview highlighted the importance of Indigenous participation and input into the plans. The Fraser Basin Council indicated that their flood planning efforts were greatly informed by Indigenous and non-Indigenous local governments. One of the biggest gaps noted in the mapping products produced was the lack of information pertaining to First Nations sites of interest; these includes land, treaties, buildings, assets, traditional fishing sites, erosion areas, and cultural and sacred sites. As a result, the potential sensitivity of mapping a number of these areas, the lack of publicly available data, and the need to obtain consent from First Nations created a complex and challenging situation for project managers.

The Fraser Basin Council risk assessment included categories related to social vulnerabilities based on census data but acknowledged not seeking out other vulnerable populations in addition to Indigenous communities. The Capital Regional District indicated that discussions are ongoing to address the needs of transient populations, Elders, and seniors.

The potential sensitivity of mapping First Nations sites of interest, the lack of publicly available data, and the need to obtain consent from First Nations created a complex and challenging situation for project managers.

OPPORTUNITY

Interviews with NDMP recipients identified many similar opportunities and challenges. Some of these were included in the 2019 *Evaluation of the National Disaster Mitigation Program,*[4] but many were findings that are specific to local and regional perspectives (Table 1).

PROGRAM CHALLENGES AND RECOMMENDATIONS

Overall, the program recipients interviewed had positive feedback to share regarding NDMP funding and the outcomes of their projects. Many emphasized the collaborative nature of the work and sharing of joint successes. Despite the sometimes ambitious nature of these projects, overall project management has proceeded smoothly, though it was noted that this may be due to the organizations interviewed having greater capacity than some smaller communities. Recipients acknowledged, though, that as the impacts of climate change continue to be felt, there will be an increased demand for disaster and climate risk mitigation funding.

Many recipients disclosed that the NDMP timelines were challenging to meet, especially given the complexity of the projects, requirement for stakeholder input, and numerous COVID-19 complications causing delays. Recipients further indicated that the limited number of consulting firms available to undertake risk mitigation work contributed to sometimes lengthy delays, as there can be more projects than technical consultants available. Consultant firms often work on multiple NDMP projects with the same deadline for deliverables, which causes timeline issues due to lack of capacity. Other issues identified include a delay in receiving GeoBC LiDAR data, which resulted in projects using existing LiDAR, rather than waiting for the 2019 data to become available. Challenging site conditions, such as high river levels, also caused surveying delays; hydraulic modelling was then delayed due to river surveys having not been completed. Finally, permitting challenges impeded progress and result in structural project delays.

A number of general project administration challenges were identified by recipients for future consideration. One interviewee requested that the program look to minimize or lessen the burden of proof for applicants. For example, is it necessary to provide evidence that climate change will impact the west coast, or can it now be considered common knowledge? Another area of concern was identified by Emergency Management BC, which indicated that Request for Proposals templates often resulted in higher actual costs than were estimated in the proposals, creating requests for downward scope amendment at a later date. Other recipients echoed that their proposals had underestimated the complexity and cost of the projects and noted that there was also a lack of clarity and definition for each eligible expense category in the budget. There was a desire for further standardization and guidance in terminology and methodology, to ensure regional, national and international alignment; this includes improving the sharing of information, plans, and strategies across jurisdictions.

To fully realize the disaster reduction goals of the Sendai Framework, the Government of Canada should consider broadening NDMP eligibility to reflect an all-hazards approach.

As part of this project, NDMP recipients spoke candidly of the benefits and challenges of obtaining federal funding, proposing numerous programmatic tweaks that would

improve program administration. It was acknowledged, however, that a key limitation of the NDMP is that, to date, it only funds mitigation for flood-related risks. And while the Disaster Mitigation and Adaptation Fund (DMAF) funds structural and natural infrastructure projects to increase the resilience of communities that are impacted by hazards triggered by climate change, to more fully realize the disaster reduction goals of the Sendai Framework, the Government of Canada should consider broadening NDMP eligibility to reflect an all-hazards approach. Following the NDMP's 2019 *Evaluation* recommendations, future mitigation programming will be considering interplays between hazards to increase resilience in Canadian communities and reduce the overall disaster risk to individuals and their homes.

Table 1: Recommendations

Recommendation	Description of Impact
1. Simplify project administration: • Lessen the burden of proof for applicants (i.e., on providing evidence that climate change will impact the West Coast). • Adjust templates to ensure they better reflect the complexity and cost of projects. • Standardize guidance and terminology.	Reduces the amount of time and number of resources or capacity recipients need to dedicate to the application process.
2. Adapt timelines to ensure they can be met by recipients.	Increases the maximum number of eligible recipients applying to NDMP.
3. Broaden NDMP eligibility to reflect an all-hazards approach.	Enables recipients to apply for mitigation funding to address other hazards, such as wildfires.
4. Increase disaster and climate risk mitigation funding.	Reduces the impacts of climate change being felt by communities.

ENDNOTES

[1] Public Safety Canada, "Evaluation of the National Disaster Mitigation Program (2019)," https://www.publicsafety.gc.ca/cnt/rsrcs/pblctns/vltn-ntnl-dsstr-mtgtn-prgrm-2019/index-en.aspx

[2] As part of the Canadian Safety and Security Program 2018 Call for Proposals, an *Adaptation Project Return on Investment Toolkit* is in development to help city officials evaluate the dollar amount of disaster risk reduction by assessing natural hazard impacts to economic, social, environmental, and cultural assets. https://aecom.com/wp-content/uploads/2021/07/SUSTAINABILITY-PROJECTS.pdf

[3] Government of British Columbia, "Emergency management financial supports," https://www2.gov.bc.ca/gov/content/safety/emergency-management/local-emergency-programs/financial

[4] Public Safety Canada, *Evaluation*.

Recommended citation
Chiang, G., Friedrich, L., National Disaster Mitigation Program Outcomes in BC, in Resilient Pathways Report: Co-creating new Knowledge for Understanding Risk and Resilience in BC; Safaie, S., Johnstone, S., Hastings, N.L., eds., Geological Survey of Canada, Open File 8910, 2022 p. 282-289, https://doi.org/10.4095/330540