USING MANAGED RETREAT TO ADVANCE THE TARGETS OF SDG11:

The Case of Post-Flood Property Buyouts in Grand Forks, BC

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SUMMARY

This article examines the 2018-2021 managed retreat initiative in Grand Forks, BC, as a case study of property buyouts as a climate adaptation tool supporting SDG 11. Following severe flooding in 2018, the city implemented a $53 million buyout program with a 3.4:1 return on investment, acquiring 140 properties and converting high-risk areas into floodable greenspace. The buyout program helped to facilitate Grand Forks' flood risk reduction efforts, adopted participatory planning, and enhanced residents' education about flood risk, but suffered from a confusing two stage buyout offer process and a lack of available guidance. Recommendations for other municipalities include more proactive buyout planning, updating flood maps, and strengthening intergovernmental collaboration to enhance resilience and support managed retreat in Canada.

SOMMAIRE

Cet article examine l'initiative de retrait contrôlé 2018-2021 à Grand Forks, en Colombie-Britannique, comme une étude de cas sur le rachat de propriétés en tant qu'outil d'adaptation aux changements climatiques soutenant l'ODD 11. À la suite des graves inondations de 2018, la ville a mis en œuvre un programme de rachat de 53 millions de dollars avec un retour sur investissement de 3,4:1, acquérant 140 propriétés et convertissant les zones à haut risque en espaces verts inondables. Le programme de rachat a contribué à faciliter les efforts de réduction des risques d'inondation de Grand Forks, à adopter un urbanisme participatif et à améliorer l'éducation des résidents sur les risques d'inondation, mais il a souffert d'un processus confus d'offre de rachat en deux étapes et d'un manque de conseils disponibles. Les recommandations pour les autres municipalités comprennent une planification plus proactive des rachats, la mise à jour des cartes de zones inondables et le renforcement de la collaboration intergouvernementale afin d'améliorer la résilience et de soutenir le retrait planifié au Canada.

Introduction

Communities across Canada are faced with increased 'hazardousness of place' due to the combination of historical settlement patterns in areas with high hazard risk (e.g., floodplains) and the changing nature of climate-related hazards such as flooding. Increased flood risk has been demonstrated across the country, including in British Columbia (BC) in 2018 and 2021, Quebec in 2017 and 2019, and Alberta in 2013 and 2019. Due to historical patterns of settlement across Canada, many communities are located close to water and have residential areas in or beside flood zones. In 2019, the Insurance Bureau of Canada estimated that around 10% of private Canadian residences are at high risk of flooding.

While structural protections such as dikes or flood walls are options to increase flood resilience in North America, the community of Grand Forks, BC, made the difficult decision to move people and property out of high-risk areas using a property buyout program, prioritizing many of the elements of SDG 11: inclusiveness, long-term safety, resilience, and sustainability.

One of only a few instances of 'managed retreat' in Canada – and the first in BC – the Grand Forks buyout program highlights many of the challenges that come with permanently moving residents in order to create safer, more resilient and sustainable

SDG Target 11.5 By 2030, significantly reduce the number of deaths and the number of people affected, and substantially decrease the direct economic losses relative to global gross domestic product caused by disasters, including water-related disasters, with a focus on protecting the poor and people in vulnerable situations.	**11.5.1** Number of deaths, missing persons and directly affected persons attributed to disasters per 100,000 population. **11.5.2** Direct disaster economic loss in relation to global GDP, damage to critical infrastructure and number of disruptions to basic services, attributed to disasters.
SDG Target 11.b By 2020, substantially increase the number of cities and human settlements adopting and implementing policies and plans towards inclusion, resource efficiency, mitigation and adaptation to climate change, resilience to disasters, and develop and implement, in line with the Sendai Framework for Disaster Risk Reduction 2015–2030, holistic disaster risk management at all levels.	**11.b.1** Number of countries that adopt and implement national disaster in line with the Sendai Framework for Disaster Reduction 2015-2030a. **11.b.2** Proportion of local governments that adopt and implement local disaster risk reduction strategies in line with national disaster risk reduction strategies.

SDG 11, Target 11.5 Focuses on Reducing Human and Economic Losses To Disasters.



communities. This research examined the Grand Forks property buyout program using a systematic lit review (N=127), followed by key informant interviews (N=27).

Using Managed Retreat & Property Buyouts to Achieve the Goals of SDG 11

While there are multiple ways to pursue SDG 11 (i.e., enhancing the inclusiveness, safety, resilience, and sustainability of communities) in hazardous areas, interest in 'retreat-related' measures have grown recently. Managed retreat refers to the intentional withdrawal, demolition, or relocation of buildings and infrastructure away from hazardous areas. Property buyouts are a form of managed retreat in which a government acquires and subsequently removes property, either proactively before disaster strikes, or reactively after disaster. Such programs allow governments to strategically move people and infrastructure out of high-risk areas and build resilience by rezoning the land to limit certain kinds of use and development. In doing so, SDG 11 Target 11.5 ("...substantially decrease the direct economic losses relative to global gross domestic product caused by disasters, including water-related disasters,"), and Indicator 11.5.2 ("...direct disaster economic loss in relation to global GDP, damage to critical infrastructure and number of disruptions to basic services, attributed to disasters") are directly addressed through buyouts. As well, Target 11.b ("...substantially increase the number of cities and human settlements adopting and implementing integrated policies and plans towards inclusion, resource efficiency, mitigation and adaptation to climate change, resilience to disasters") is also supported. Buyout programs have been conducted around the world with varying success. In the United States, they are commonly a post-disaster response funded by the federal government and implemented at the community scale. In other jurisdictions they have been successfully used to move communities out of harm's way from sea-level rise and earthquake liquefaction risk.

Unlike other disaster risk reduction strategies, managed retreat eliminates hazard risk to residents and infrastructure, and facilitates the creation of multifunctional spaces and amenities (e.g., greenspace, recreational areas) that can do double duty as flood management features. As a one-time cost, the financial argument for retreat is strong: the Grand Forks mitigation program return on investment (ROI) was estimated at 3.40:1 – a conservative calculation that only considered damage to structures and their contents, not other costs such as loss of life, ecological damage, lost income, lost business revenue, social stress, and damage to infrastructure. Despite strong financial rationale for managed retreat, buyout programs are contentious in communities, and designing successful programs can be difficult to achieve.

Property buyout programs for resilience-building involve several key considerations. Financially, it is important to determine how much property owners are being compensated, and to identify potential funding sources. Timing plays a critical role, including considerations about whether the program occurs proactively before or reactively after a hazard event, and how long it takes for property owners to receive compensation. Justice and equity considerations focus on the buyout program's level of coercion, its fairness, the relative inclusivity of program consultations, and the transparency of the buyout process. There are also significant emotional dimensions, including property owners' understanding of the risks of staying in place and their attachment to their homes. Finally, the role of participating agents, such as program developers, implementers, and political actors, along with the quality of public consultation, can significantly influence a buyout program's success.

Case Study: Grand Forks, BC

On May 7, 2018, the City of Grand Forks launched a floodplain risk management and protection program to assess flood risks, prepare flood maps (last updated in 1992), and develop mitigation plans (see Figure 1)



Source: *grandforks.ca.*

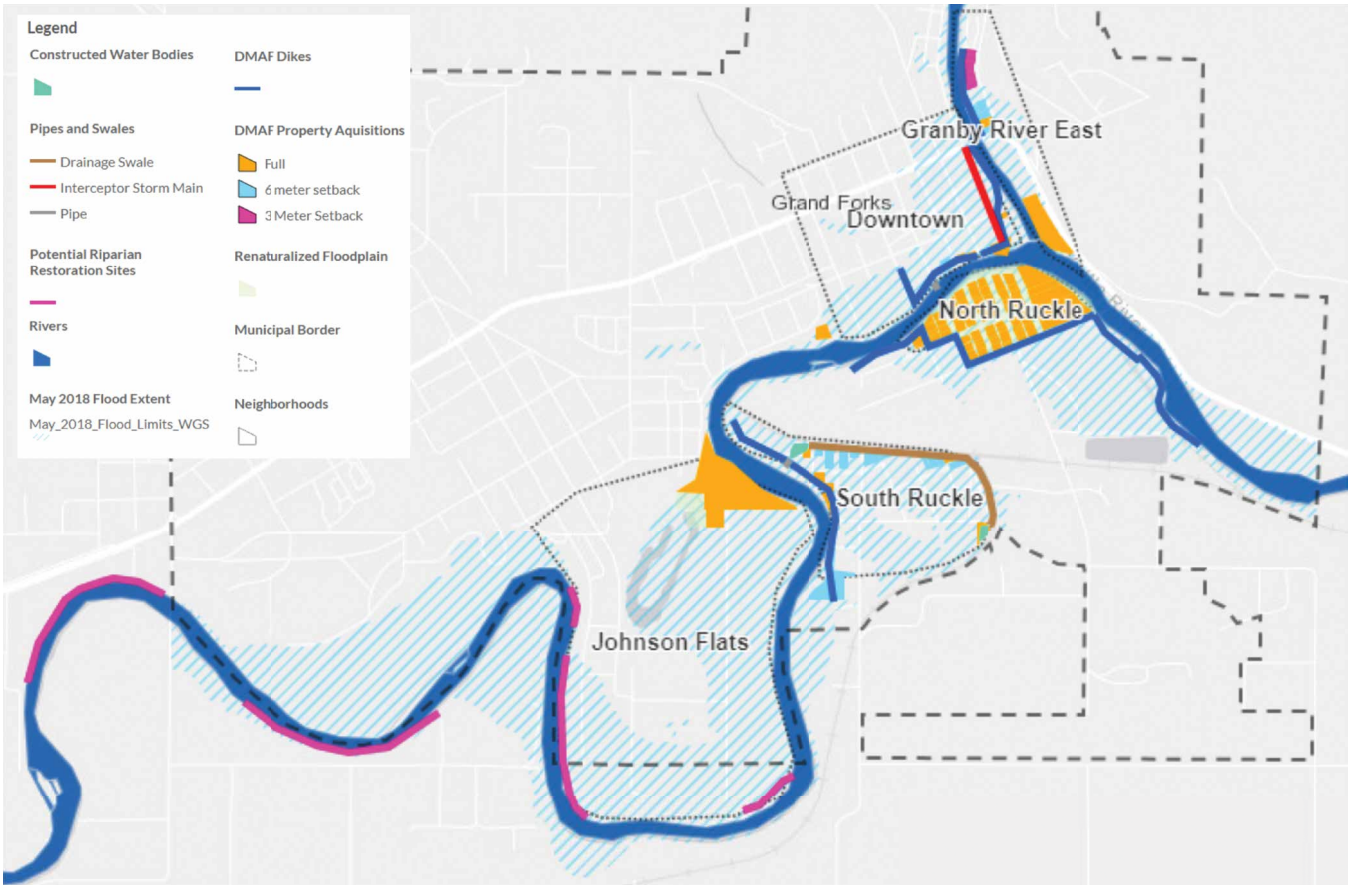


Figure 1: Grand Forks Flood Mitigation Program, as of 2019

to protect the community from flooding, and only four days later the City and surrounding area experienced a 1-in-200 year flood event, the worst flooding on record. It was freshet season, and the nearby snowpack was 238% of normal. Over the course of the three-day flood event, nearly 1500 households received evacuation orders and more than 50 houses were damaged beyond repair. Flood damages totaled nearly $50 million, including significant damage to dikes, community infrastructure, residential homes, and commercial property.

A summer of recovery and consultation followed, culminating in September, when the City Council voted to move people and property out of high-risk flood zones in the community. The municipal planning team then embarked on a multi-million-dollar, multi-year program to purchase close to 140 properties from property owners and return the areas to floodable open space. The buyout aka “land acquisition” program was launched in early 2020, and substantially concluded by late 2021.

The Grand Forks ‘Land Acquisition Program’ was initiated and managed by the Grand Forks Planning Department, with acquisitions negotiated through a consultant. It was a reactive program, developed following the May 2018 flood event, with buyouts running from January 2020 to Fall 2021 and additional flood-mitigation related work completed by Fall 2023. The program targeted approximately 140 residential properties, including some rental properties and home businesses. Funding for the $53 million program was cost-shared by the Government of Canada, the Province of British Columbia, and the City of Grand Forks.

Homeowner compensation was initially based on post-flood assessed property values, with additional top-ups under expropriation legislation, including minimum offers of $20,000 for parcels with property and $5,000 for vacant parcels. The program achieved a 99% voluntary uptake by August 2021, with only three properties requiring expropriation. Acquired lands were repurposed into floodable open spaces, such as parks and green spaces, protected through rezoning and covenants for at least 40 years.

Takeaways And Recommendations

The Grand Forks case study research explored constraints and enablers of the property buyout program, in addition to elements for successful disaster risk reduction, and these led to a series of recommendations that other Canadian communities can follow when considering managed retreat. In BC, communities that are considering a property buyout program face a range of constraints, many of which may only be overcome during the window of opportunity that follows a large-scale disaster such as the 2018 flood. This window may make funding more accessible to support these expensive programs, and community members and politicians may become more amenable to these drastic measures. Although interviewees broadly supported a managed retreat approach to disaster risk reduction,

they stressed the importance of transparent, inclusive, and human-centric implementation that is guided by high-quality data and consistent public input. As climate change increases and highlights disaster risk in communities across Canada, public investments at all levels of government are needed to make managed retreat a viable tool in the climate adaptation toolbox.

Canadian communities and municipalities considering managed retreat can adopt several key strategies to address flood risks and enhance resilience. First, updating floodplain and risk mapping is crucial for understanding and managing flood risk. This data allows for informed updates to flood construction levels, floodplain bylaws, and localized risk reduction plans. Public education on flood risks and mitigation options should also be prioritized, as many community members misunderstand these issues. Additionally, as demonstrated by the challenges faced during the Grand Forks buyout program, local governments should advocate for increased funding, policy changes, and resources from higher levels of government and industry. Proactively developing risk reduction plans and leveraging post-disaster opportunities can help overcome barriers to implementing managed retreat. Furthermore, exploring creative planning tools, such as land swaps, development credits, and equity loans, may enable more flexible and effective retreat initiatives.

Municipalities can also enhance resilience by incorporating adaptation considerations into planning policies, such as zoning bylaws, risk-sensitive setbacks, and restrictive covenants. High-level guidelines in regional growth strategies (RGS) and official community plans (OCP) can further support resilience-based planning. To address the human impacts of managed retreat, communities should engage in capacity building for trauma-sensitive and reflective planning practices. This approach ensures that planning efforts are considerate of individual and community trauma, minimizing the risk of re-traumatization while fostering effective, inclusive decision-making. These recommendations build on lessons from the Grand Forks case study and provide a comprehensive framework for managing retreat in flood-prone areas.



To support managed retreat as an effective climate adaptation tool, Provincial and Federal levels of government in Canada should adopt several key strategies. First, establishing a permanent funding program for both proactive and reactive managed retreat is essential, as property buyout programs are costly and local governments often lack sufficient resources. Additionally, governments should develop comprehensive guidance and resources to assist communities in implementing managed retreat programs. These resources could include best practices for public consultation, trauma-sensitive planning, funding options, and effective program design. Strategic partnerships with academia, industry, and non-governmental organizations are also recommended to collaboratively create evidence-based best practices that address the complexities of managed retreat, such as real estate, insurance, and flood risk reduction.

Moreover, revising disaster financial assistance arrangements (Provincial DFA and Federal DFAA) to encourage a retreat mindset is vital. For instance, limiting compensation for repetitive rebuilding and reallocating funds towards relocation in high-risk areas can promote proactive risk reduction. Governments can also promote risk reduction measures by embedding them in high-level strategies, legislation, and policies, such as requiring 'build back better' principles or setting risk targets for communities. Finally, additional funding for floodplain and risk mapping is necessary to ensure communities fully understand their flood risks and can make informed decisions. By prioritizing these strategies, managed retreat becomes a crucial adaptation tool that supports sustainable development and helps communities achieve SDG 11, fostering resilience and sustainability in Canadian communities.

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