



# **Social Impacts of the 2018 Grand Forks Flood**

**A Gender Based Plus Analysis of Climate Risk**

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We would also like to thank the Ministry of Environment and Climate Change Strategy for their support. Thank you to Dr. Maya Gislason and Jordan Brubacher from the Faculty of Health Sciences at Simon Fraser University for collaboratively embarking on the larger project that informs this research.



## **This summary report is part of a larger project conducted for the B.C. Ministry of Environment and Climate Change Strategy to examine how diverse populations in B.C. are being impacted by a variety of climate change risks such as wildfires, extreme temperatures, and flooding.**

The project looked at how different populations are impacted by climate change. Research shows that risks due to the impacts of climate change are unequally distributed across peoples and communities.<sup>1</sup>

This project summary addresses inequities in light of climate risks, but it is evident that the systemic issues that underlie these impacts have much broader implications. As work on climate risks and equity becomes further developed by the Province, it is important to continue to focus on impacted populations involvement within this work.

As part of this project, the 2018 Grand Forks flood was chosen as a case to explore the impacts of the flood on women and diverse populations in the Boundary region (e.g. elders, Indigenous peoples, low income). The purpose of this summary report is to present key findings about how gender intersects with a range of factors (e.g. race, age, ability, socio-economic status, etc.) to influence the extent that different populations were affected by the 2018 flood.

The research for this case study was done through interviews and a literature review. The literature review involved studying available reports on the flood, reports on the Boundary region, and broader research that informs GBA+ and climate change impacts in B.C. Interviews were done with seven government representatives and agencies involved in the flood response and recovery efforts, including those who provided specific supports to flood impacted populations in the Grand Forks region.<sup>2</sup> Many interviewees continue to confront the aftermath of the 2018 flood today, together with the impacts of COVID-19. A defining feature of the Grand Forks flood response was a recovery response plan that built capacity locally for a robust community-led recovery effort. In this report, the five-pillar recovery management model that was developed, based on the pillars of critical infrastructure, wellness, economy, environment, and housing is discussed, before outlining lessons learned.

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<sup>1</sup> Rudolph, L., Harrison, C., Buckley, L. & North, S. (2018). "Chapter 2: Health Equity in Climate Change". In *Climate Change, Health, and Equity: A Guide for Local Health Departments*. Oakland, CA and Washington D.C., Public Health Institute and American Public Health Association

<sup>2</sup> This study went under harmonized ethics review and received a certificate of approval from the Research Ethics Board of BC (UBC REB #: H20-02323).

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## Gender Based Analysis Plus (GBA+)

**GBA+** - Gender Based Analysis Plus (GBA+) is a policy tool that the Province of British Columbia is using to identify the impacts of climate change on diverse populations. GBA+ is a frame that prioritizes looking at how intersecting factors impact lived experience. It is used to look at how diverse groups of women, men, and gender diverse peoples experience government policies and programs differently. The “plus” is meant to show that identity factors, such as race, ethnicity, religion, age, or mental/physical ability also interact to influence how government programs, including emergency response and recovery to climate change events, are experienced.<sup>3</sup>

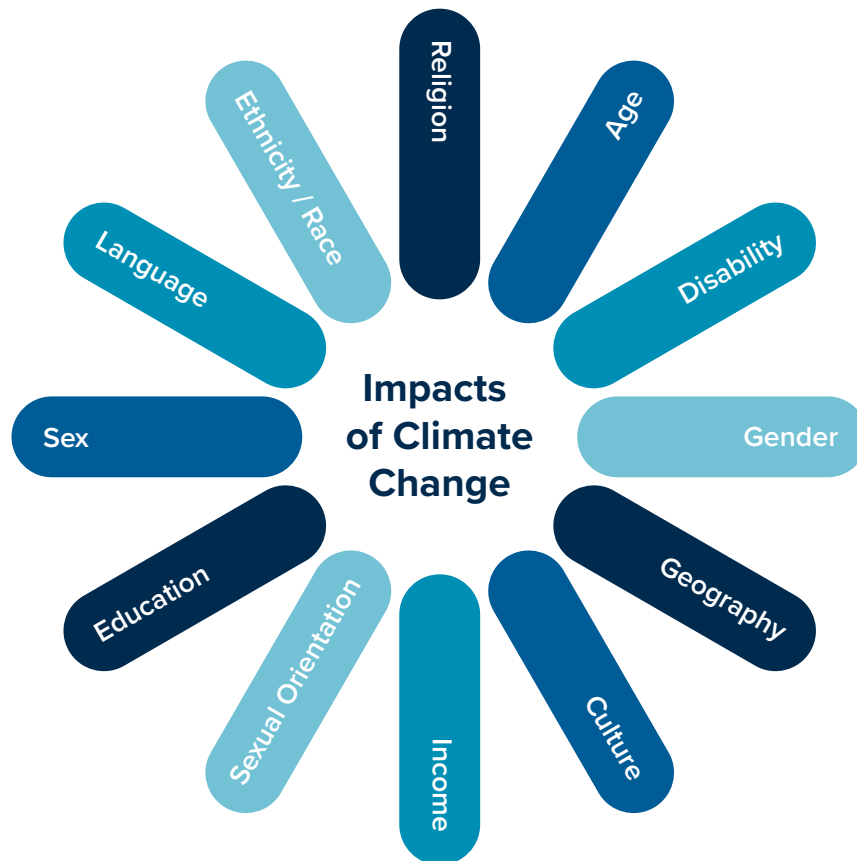


Figure 1. Gender Based Analysis Plus (GBA+)

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3 Status of Women Canada, “What is GBA+”, 2021 (<https://cfc-swc.gc.ca/gba-acsi/index-en.html>)



# Grand Forks Flood of 2018

On May 10, 2018 after a week of high temperatures and three days of rainfall Grand Forks, B.C. and the Boundary Region experienced the worst flood in history, as the confluence of the Kettle and Granby Rivers exceeded a 200 year flood level. This was partially caused by a large amount of snow melt, as in late spring snowpack was 240% the average for early May.

Multiple residential, commercial and industrial neighbourhoods in Grand Forks were evacuated and thirty-eight rescues were performed via boat and helicopter. Of the 1500 buildings evacuated in the Boundary region, over 500 were damaged. Water levels were high, with communities in the entire Boundary region reaching to Christina Lake experiencing infrastructure damage and drinking water advisories. Damage was estimated at over \$38 million to agricultural operators, residential neighbourhoods, commercial areas, and industrial operations.<sup>4</sup>

Grand Forks' lowest-income neighbourhoods were the most heavily impacted from the 2018 flood, which is not unique to major flooding events. For example, in the aftermath of the Hurricane Katrina floods in New Orleans, low-income Black residents were in most need of assistance.<sup>5</sup> Housing demand rose post-Katrina as supply was diminished, and this had negative impacts on New Orleans populations that were already living below or near the poverty line.

Within Grand Forks, the neighbourhoods that were most impacted were North and South Ruckle and Johnson Flats. These neighbourhoods include a larger proportion of rental housing than other parts of Grand Forks as well as many older houses in need of maintenance and repair.



<sup>4</sup> Climate Basin Climate Source, Climate Action Case Study "Grand Forks-Flooding" [https://basinclimatesource.ca/case-studies/CaseStudy\\_GrandForksFlooding.pdf](https://basinclimatesource.ca/case-studies/CaseStudy_GrandForksFlooding.pdf)

<sup>5</sup> Elliott, J., and Pais, J. (2006). "Race, class, and Hurricane Katrina: Social differences in human responses to disaster." *Social Science Research*, 35(2), 295-321



## Social Impacts of the Floods

Results from interviews with those involved in the 2018 flood response showed that four key sub-populations were significantly impacted by the flood: **women, the elderly, Indigenous peoples, and low-income, homeless/ precariously housed populations.**

While there was not comprehensive data collected that could be used to assess the detailed impacts of the flood on different populations in the region, it was clear from the observations and experiences of those interviewed that those most impacted by the 2018 flood were populations that: (i) did not have financial or housing security; (ii) were most exposed to flood risk because they lived in the flood plain (e.g. the North/South Ruckle neighbourhoods) and (iii) had lower capacity to personally respond to the flood due to financial insecurity. These observations are consistent with research on key factors that determine vulnerability to climate change.<sup>6</sup> (Also see Appendix A. Summary of Social Impacts.)

### Resilience

Despite experiencing significant impacts from the flood, Grand Forks residents, including those in the North and South Ruckle area, demonstrated a great deal of resilience. Interviews indicated a strong ‘bonding together’ and community spirit. Despite tensions (including over the buy-out program) and inequities experienced by and through the flood, there were also clear places where the community came together, like women in business ‘bouncing back’ and exercising leadership to bring community together. Some spoke about the unique empathic and collaborative capacities of women in particular and how these were assets and a ‘beacon for others’ in the flood response.

6 Williams, L., Fletcher, A., Hanson, C., Neapole, J., & Pollack, M. (2018). Women and Climate Change Impacts and action in Canada—Feminist indigenous and intersectional perspectives. [https://www.criaw-icref.ca/images/userfiles/files/Women%20and%20Climate%20Change\\_FINAL.pdf](https://www.criaw-icref.ca/images/userfiles/files/Women%20and%20Climate%20Change_FINAL.pdf); Vinyeta, K., Whyte, K. P., & Lynn, K. (2015). Climate Change Through an Intersectional Lens: Gendered Vulnerability and Resilience in Indigenous Communities in the United States. United States Department of Agriculture. Retrieved from [http://www.ascr.usda.gov/complaint\\_filing\\_cust.html](http://www.ascr.usda.gov/complaint_filing_cust.html)



# Impacts on Unhoused and Precariously Housed

Prior to the 2018 flood, there was a **pre-existing need for affordable housing in the Boundary region** and particularly within Grand Forks. Shelter costs that are over 30% of household income are assumed to be unaffordable.<sup>7</sup> Prior to the flood, 54% of tenant households (those renting) in Grand Forks were living in unaffordable housing.<sup>8</sup> The implications of being in a housing crisis amidst a flood are severe and compounded with the impacts of the flood, disproportionately impacting those most housing insecure. The floods had significant housing impacts on multiple groups of people:

- » The **unhoused** population who often camp by the river lost access to their home. There was an increase in unhoused and precariously housed, or those ‘couch surfing’ following the floods.
- » Even two years after the 2018 flood many individuals remain living in sub-standard living conditions that continue to have health and wellbeing impacts.
- » There were also impacts on **renters** who lost their homes in the flood and had nowhere to go. There were reports of an increase in landlord abuse following the floods. With even less supply of rental properties, some landlords increased rents, required higher damage deposits and had more stringent ‘vetting’ practices, making it difficult to access housing if one was already more at risk (i.e. unhoused, fleeing abuse). It was reported that women in particular experienced a disproportionate amount of landlord abuse.

- » **Homeowners** also suffered from housing related problems, in that there was a gap in resources that were provided for those who did not have flood insurance.
- » **Short-term housing needs:** In a survey conducted three months after the flooding, there was a need articulated around temporary housing with respondents suggesting the need to “establish short-term housing ASAP for the impacted residents, through ATCO trailers or something similar to be placed on City land”.<sup>9</sup> We also heard that finding appropriate models of sustainable housing was one of the many challenges of the response.

**“All of the places used by folks to couch surf, rentals, are all gone now.”**

– Interview participant

**“A large rental component of housing was affected. The ability of people to make rent payments is still suffering.”**

– Interview participant



<sup>7</sup> Rural Development Institute (2016) Trends Analysis *Poverty*

<sup>8</sup> Rural Development Institute (2016) Trends Analysis *Poverty*

<sup>9</sup> British Columbia Economic Development Association, Business Assessment Final Report (2018) *Grand Forks Economic Disaster Recovery Program*



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## Impacts on Indigenous Populations

**“Cultural safety is a crucial element in offering services.”**

– Interview Participant

The Grand Forks region is located in the traditional territory of the Okanagan Nation, and is not in close proximity to a First Nations reserve. This is in part due to colonialism and displacement that took place in the 1800s. There is a lack of data on the racialized and Indigenous impacts of the flood as those receiving support were not asked to indicate race or ethnicity in the assessment intake process. Grand Forks does not have a Native Friendship Centre which makes it difficult for Indigenous peoples in the region to access culturally safe spaces. There was a reported perception that racism in the community creates disadvantages and vulnerability for local Indigenous peoples. Chief Maureen Chapman and George Abbott’s independent review of the flood and wildfire season in British Columbia in 2017 acknowledged that emergency

preparedness planning requires more robust First Nations involvement in the organizational process, including the consideration of First Nations culture/ knowledge training and awareness.<sup>10</sup> Echoing these recommendations from Chief Chapman and Abbot, interviews indicated the need for attention to First Nations cultural awareness and involvement in the Grand Forks flood response efforts.

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<sup>10</sup> Abbott, G., & Chapman, M. (2018). Addressing the New Normal: 21st Century Disaster Management in British Columbia Report and findings of the BC Flood and Wildfire Review: An independent review examining the 2017 flood and wildfire seasons. Retrieved from <https://www2.gov.bc.ca/assets/gov/public-safety-and-emergency-services/emergency-preparedness-response-recovery/embc/bc-flood-and-wildfire-review-addressing-the-new-normal-21st-century-disaster-management-in-bc-web.pdf>



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## Gendered Impacts and Impacts on Elderly

**“Women became the focal point of maintaining cohesive family units and extended care. It became them managing their own family and children and others.”**

– Interview participant

Women, and in particular mothers and single mothers, were impacted by the floods. Since women often play a caregiving role in supporting family, they bear much of the burden of getting through the crisis. This burden is especially heavy for women who were living in poverty before the flood. As was stated in a variety of ways during interviews, women were disproportionately affected, specifically single women and the elderly.

**“We had a fair amount of elderly population that passed away within 6-8 months of flood. The wives would say this was due to the stress.”**

– Interview participant

Overall, elderly people experienced exacerbated health challenges during the flood. The mental and physical health impacts of the flood on elderly men due to stress was a key theme. Those interviewed reflected on the troubling trend that a number of elderly men with underlying health conditions died within the months, and up to a year, after the flood. While there is no quantitative data on this, many shared their observation of this pattern and suspected these men were overwhelmed by the flood, making it challenging for them to take care of their physical and mental health. As a result, in the months and year following the flood there was also an observed increase in the number of recently widowed elderly women. These women were left to cope with the flood response and recovery on their own.

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## Impacts on Gender-Based Violence

While those interviewed did not have quantitative data on rates of reported domestic violence following the flood, many mentioned a rise in domestic violence. There were reports of an increase in the demand for women’s transition house spaces, leading to conclusions about gender-based violence and safety concerns, particularly during what is referred to as the “trough” or emotional low point during the recovery period.

**“In the first year, we almost saw a decrease in transition house calls—women would stay with family, friends. It was the year after this, it started to increase. We saw almost doubled rates of demand for the transition house in 2019-2020. This is still a direct impact after the floods.”**

– Interview participant



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## Impacts on Economic Loss

The jobs lost from local businesses in the downtown core were in many cases low paying—servers, retail clerks—and often held by women. This increased the vulnerability of women, was particularly challenging for women that traditionally maintain a caregiving role for children due to lack of economic security.

*The Agricultural Sector:* The rural agricultural sector was significantly impacted by the flood, with an estimate from *Community Futures* that 10-20% of business in the agricultural sector did not ever recover. This was reported across the Boundary region. In west Boundary there were many rural farmers impacted, with crops wiped out and houses damaged. Many agriculture producers are immersed in a culture that created barriers to acknowledge they needed help. The response effort directly reached out to them to register them for emergency social services.

**“With the nature of some of the businesses downtown, most jobs were lower paying and held by women on the cusp of vulnerability, young single moms.”**

– Interview participant

**Local businesses reported \$2.4 million in lost wages, while 26% of businesses stated they would not be able to hire back their laid off employees.**

– British Columbia Economic Development Association, Business Assessment Final Report (2018) Grand Forks Economic Disaster Recovery Program

# Community Led Response and Recovery Strategy

**“Trust was a key element of how that team got together and was cohesive and got things done.”**

– Interview participant

The Grand Forks model of flood response and recovery was based on a partnership between the Regional District of Kootenay-Boundary Emergency Program, the City of Grand Forks, and multi-stakeholder leadership from across a number of sectors in the community. A defining feature of the Boundary Flood Recovery was an intentional decision to build capacity locally for a community-led recovery effort. As a result, a five-pillar recovery management model was developed: Critical infrastructure; Wellness; Economy; Environment; Housing.



**Five Pillars of Recovery Management Strategy**





## Successes from Grand Forks Recovery Model

» **Distributed and Collaborative Leadership:** The Grand Forks model was described as a “distributed” and “collaborative” leadership approach founded in trust. A lead agency was invited to coordinate the response for each pillar. The pillars worked together to “deal with issues adaptively as they emerged.” The Wellness recovery pillar provided leadership to coordinate the health and social response from the flood, including outreaching to most affected populations.

**“It was a coordinated working group approach with strong leadership from within each of the pillars.”**

—Interview participant

- » **Local Capacity Building:** It was a priority to first look for community leaders who had expertise and capacity to play a leadership role in the recovery management model. Only after community capacity had been explored were outside experts brought in. This model helped impacted populations, as it supported local agencies that are most knowledgeable about community need.
- » **Case Management Approach:** The model used a case management approach that provided individualized outreach and engagement to different populations in the community. This was important to ensure the response effort was aware of and acting on a range of needs from populations that would not have sought out support on their own. Personal relationships and trust were established between those most impacted and the lead agencies.





## Lessons Learned

- » In the case of Grand Forks, the most effective flood recovery role was that led by well-funded and supported local organizations.
- » Risk / vulnerability assessments and advance planning need go beyond technical components and include considerations of health and wellbeing for diverse populations, including cultural safety for Indigenous peoples.
- » Additional resources for local family and health organizations and upstream planning, including social planning in regard to gender diversity and gendered impacts, will improve climate change resilience: what's the community's level of readiness? What supports might service providers need to prepare for flood season?
- » There is a need to work with rural and remote areas that are likely to be impacted to understand who lives there and how floods or fires, for example, will impact these populations and the economy specifically.
- » There is a need to be more nuanced about sub-populations and diversity in communities that will need supports. Which populations in the community will need the most support? What are the upstream impacts that can be accounted for, like poverty reduction and housing? What sort of engagement is needed? How can this work be grounded in GBA+ principles?
- » There needs to be clarity on roles and expectations from different levels of government, this is particularly significant in terms of finding housing solutions, which can be a huge challenge.
- » There is value in sharing the experiences and lessons learned of the Grand Forks flood with other flood prone communities in B.C.

## Conclusion

“This is important work, so we understand how different genders, social groups and populations are affected by events like this. In disasters we try to make everything equitable, but **some need more support** because they were not starting out with as much to begin with. When we think of these wide-scale events, we need to be cognizant that not everyone gets same amount, **but we all get to the same place.**”

–Interview Participant

While B.C. is still at the early stages of understanding how climate change will impact diverse populations across the province, cases like the 2018 Grand Forks and Boundary flood are useful in providing a deeper understanding of which populations are impacted the most by climate-induced emergencies. The reflections, stories and perspectives shared from the Grand Forks residents involved in this project will shape a deeper understanding of the human and social dimensions of flooding events.

By using a GBA+ lens this project has shown that the impacts of the Grand Forks and Boundary flood were most severe for those that were already vulnerable and experiencing inequality in some way like those living near or below the poverty line and people who are precariously housed. While these findings may not be surprising and are similar to the impacts observed from the aftermath of other flood events elsewhere, they illustrate that *marginalized populations often face multiple, overlapping inequities and these inequities are amplified by the impacts of climate change.*



This work has identified gaps where more robust help is needed for communities in rural and remote B.C. such as identifying the upstream strategies that can help those most in need in the aftermath of flooding. Mental health supports and housing are two areas that especially require prior planning to help mitigate the impacts of floods.


As one interviewee noted, “A challenge for local governments is hearing from those that are impacted the most in a fair way. There is no system in place to hear these challenges from impacted populations.” Floods stretch far beyond the immediate crisis and the most impacted face systemic barriers. Though challenges remain as to how to best plan for an equitable response to flooding events so health and wellbeing are accounted for across local populations, lessons learned from the Grand Forks Case can help identify strategies for flood preparedness into the future.



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## Appendix A. Summary of Social Impacts

IMPACT	DESCRIPTION
 <b>MENTAL HEALTH</b>	<p>Local service agencies and Interior Health reported an <b>increase in mental health challenges</b> such as anxiety, depression and PTSD in Grand Forks following the flood. Some described residents would experience anxiety every time it rained and that flood season in subsequent years would exacerbate anxiety and panic attacks.</p> <p>There was a significant increase in the <b>demand for mental health supports</b>, including school-based mental health services. The Women's Coalition reported a waitlist of women waiting to speak to psychiatrists and Community Futures reported women business owners and women in the agricultural sector suffering from what was described as PTSD.</p> <p>After noticing increases in distress and <b>substance use</b>, a case manager approach was created to offer psycho-social supports to affected residents. More women than men accessed these supports. Counselling services were provided to flood impacted people until March 31, 2020. Interior Health and service providers described an increase in substance use (more so for men) and overdose rates following the flood.</p>
 <b>PHYSICAL HEALTH</b>	<p><b>Health issues</b> arose about six months after the flood and continued until approximately one year later.</p> <p>The flood created unhealthy and <b>unsafe living</b> conditions in the impacted homes such as standing water in basements and mould. A lack of housing availability and options resulted in people occupying homes that are unsafe/unfit.</p>

IMPACT	DESCRIPTION
 <p><b>SOCIAL</b></p>	<p><b>Community infrastructure</b> Due to the flood, community facilities closed, such as the seniors centre that did not reopen. This has impacted the ability for seniors to maintain social connections.</p> <p><b>Relocation</b> Impacts from the flood (psychological, economic) were so great for some, that they chose to relocate to different communities.</p> <p><b>Social Tensions</b> The property buy-out process was complex; some people got exhausted and lost confidence in various levels of government providing support. Within the community, people reported divisions developing between residents and even neighbourhoods over the perception of unfair flood settlement packages.</p> <p><b>Media</b> For some there is the perception that the <b>media</b> has created a ‘hard luck’ story of Grand Forks, creating the identity of a vulnerable community.</p>
 <p><b>FOOD SECURITY</b></p>	<p>The <b>food bank</b> was impacted, had to relocate, and saw additional demand; food is more expensive in rural communities to begin with. After the provincial financial assistance ended in July 2019 there was a spike in food insecurity.</p>
 <p><b>HOUSING</b></p>	<p>Challenges involved in <b>finding adequate housing</b> for those impacted by the floods was a key interview theme. Housing was overwhelmingly reported as a gap that was not adequately filled due to the complexity of the issue. Many homes needed to be evacuated for at least six to nine months. Some social service agencies reported more women applying for the Homeless Prevention program.</p>
 <p><b>ECONOMIC</b></p>	<p>Community members and local businesses experienced <b>a great deal of economic loss</b> due to the 2018 flood. In a survey of 125 businesses 92% of respondents reported an economic loss due to the floods and local businesses reported \$2.4 million in lost wages, while 26% of businesses stated they would not be able to hire back their laid off employees.<sup>11</sup> Many businesses needed to close for 6-12 months and some permanently, similar to the impacts of COVID-19 across B.C.</p>

<sup>11</sup> British Columbia Economic Development Association, Business Assessment Final Report (2018) *Grand Forks Economic Disaster Recovery Program*

To access the full reports from the project  
“GBA+, Intersectionality and Climate Change in BC,”  
please contact **[ClimateReadyBC@gov.bc.ca](mailto:ClimateReadyBC@gov.bc.ca)**