Maximizing the public value of Canada's new flood insurance program

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FLOOD INSURANCE PROGRAM

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ABSTRACT

The Government of Canada has announced a new program in Canada's property insurance market to improve the availability and affordability of coverage for households in high-risk flood areas. The proposed flood insurance program (FIP) will allocate federal funds to insure properties deemed too risky for private coverage and will subsidize premiums for low-income households. Despite these benefits, the federal government is facing considerable political pressure to cut public spending. The imperative to contain costs, coupled with climate change and other factors that are driving up insurance costs, presents a significant challenge for the design of the FIP. This policy brief identifies several ways to manage this challenge, including:

- Adopt flexible, risk-based pricing that minimizes exposure to the increasing costs of climate change.

- Strengthen disaster risk reduction by prohibiting the use of funds for rebuilding in high-risk areas, buying out high risk properties, and increasing information on Canadians exposure to risk.

- Leverage the FIP to increase innovation in insurance markets by improving data acquisition and models to lower costs and customize solutions for underserved communities.

**Key words** insurance; flooding; risk reduction

KEY MESSAGES

- The Government of Canada is developing a flood insurance program (FIP) to ensure affordable property coverage for households at high risk of flooding

- Climate change is likely to increase the public costs of this program despite ongoing political pressure to reduce spending

- To maximize the efficiency and political durability of the flood insurance program, policymakers should couple its objectives with other changes to Canada's disaster risk reduction regime

- Key policy recommendations include adopting risk-based pricing with a commitment to phase-out the subsidy, funding strategic retreat, increasing transparency over flood and climate risk data and encouraging innovation in insurance markets
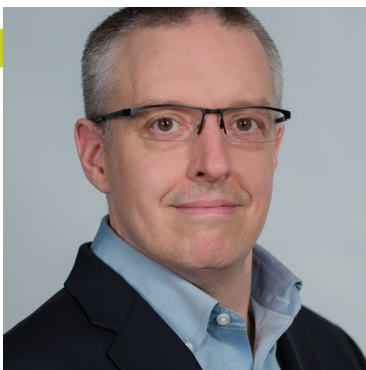
INTRODUCTION
Pressures on Canada's flood insurance program (FIP)

Canadians who cannot access or afford private property insurance coverage face extraordinary financial risks when disaster strikes. In some cases, individuals are forced to divert scarce savings to recovery or struggle to sustain mortgage payments in the event of a significant loss. The risk is especially acute in areas highly prone to overland flooding,[1] where private insurance is unavailable or unaffordable. Indeed, a Quebec bank recently announced it would no longer finance new mortgages in the high-risk flood zone (Shingler 2024). The Government of Canada has attempted to address this "protection gap" by allocating $31.7 million over three years to Public Safety Canada (PS) and the Canadian Mortgage and Housing Corporation (CMHC) to implement a low-cost flood insurance program (FIP) that would sustain affordable property coverage for households at high risk of flooding.

Within the FIP, policy development is almost complete on two fronts. The first is the creation of a new public insurance facility backed by the public treasury, which would enable insurers to cede policies deemed too risky or expensive for the private market. The second is a public subsidy program to offset the cost of property insurance coverage for targeted households. The anticipated benefits include a shared public-private commitment to provide financial protection for high-risk households and reduced dependence on taxpayer-funded disaster assistance programs.[2]

Like all government programs, the FIP's political viability is contingent on making the case that its benefits exceed its costs and, more broadly, that it creates public value—a material improvement in the economic and/or social conditions of Canadian society. If the costs of the FIP are perceived to exceed the benefits, the program is less likely to be politically durable through a change of government leadership, especially with increasing pressure to cut public spending.

Similarly, as climate change triggers more widespread and devastating flood damages, the public value of the FIP will be increasingly challenging to sustain. Experience in some U.S. states demonstrates that climate change has significantly expanded the use of public insurance as property owners find their private coverage cancelled or their premiums significantly increased (Copley, Hersher, and Rott 2023). In the face of these pressures, political support for public flood insurance will be difficult to sustain over the long term.

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1   Overland flooding refers to property inundation in which water from surface accumulation or the overflow of a body of water seeps into a house through windows, doors and cracks.

2   Historically, flood damage was eligible for government disaster assistance funding. Once insurance is available, flood damage is no longer eligible for these programs. Many have argued this will reduce a moral hazard that encourages risk behaviour and development in high-risk areas since local governments can rely on disaster assistance to pay for the damage without consequence.

Three interconnected policy considerations

How can Canada's approach to the FIP maximize public value in the era of climate change? This section focuses on three interconnected policy considerations that demand attention alongside the introduction of the FIP.

1. RISK TRANSPARENCY: THE SOLIDARITY VS RISK-BASED MODEL

Public insurance programs in other states typically address gaps in availability and affordability in one of two ways. The first approach, as exemplified in countries such as France and Spain, is based on a "solidarity principle", whereby insured losses beyond a specified threshold are absorbed by the public treasury (i.e., a government backstop). Property insurance coverage is often mandatory, which ensures a large pool of policyholders that generates enough premium income to cover geographically-concentrated losses. By sharing the financial burden of losses between government, insurers and property owners, the need to increase premiums or exclude coverage due to climate change is reduced.

The second approach is risk-based, whereby a levy charged to low- and moderate-risk households, or a subsidy from the public treasury, is used to reduce premiums for high-risk households. In the United Kingdom, for instance, all property insurers pay a statutory levy into a not-for-profit national pool, FloodRe, which is used to finance lower premiums to the highest-risk properties in exchange for a commitment by governments to fund risk mitigation until premiums can be made actuarially sound (Flood Re 2018).

Although both approaches involve market intervention to sustain insurance availability and affordability and to cope with large loss years associated with climate change, the risk-based model is more suitable for Canada due to the geographic distribution of risk. Almost 90 percent of flood-related risk is concentrated around 10 percent of residential properties, meaning most policyholders live in low- and moderate-risk zones (See Figure 1) (Public Safety Canada 2022). This concentrated exposure creates an opportunity to leverage the FIP to improve transparency over the real risk faced by these communities and the need for significant mitigation.
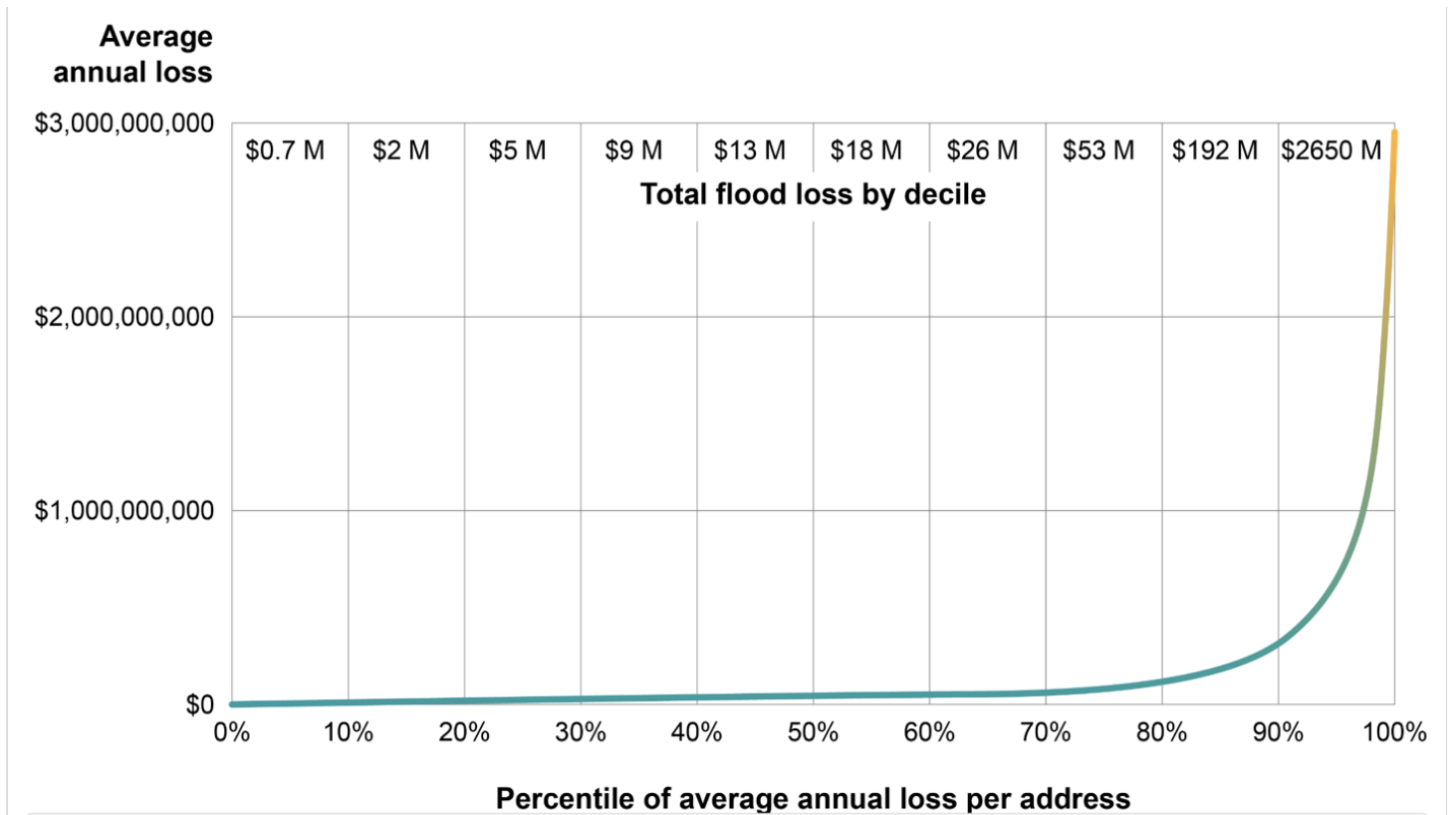
Figure 1: Flood risk concentration in Canada   Source: (Public Safety Canada 2022)

In the solidarity model, premiums do not reflect the actuarial risk to a property, thereby limiting the incentive to reduce the risk. By contrast, the risk-based model can be designed to incorporate a "price signal" that informs policyholders about the benefits of risk reduction. To date, this price signal has been obscured in high-risk communities due to the availability of disaster assistance. The solidarity model would continue this ineffective practice. The FIP can communicate to policyholders for the first time their actuarially informed premium along with the affordability subsidy they are receiving so they are made aware of their real risk.

This awareness, combined with a timeline or "sunset clause" specifying when the subsidy will be eliminated, could encourage property owners to pressure their local and provincial governments to invest in risk reduction. If

the risk is mitigated before the clause takes effect, the subsidy can be eliminated (e.g. FEMA 2023). Full disclosure of the actuarial rate of risk, combined with a schedule to reduce the subsidy, creates a much stronger incentive than exists today for households and communities to invest in risk reduction.

The concentration of flood risk in Canada also limits the political feasibility of a national, solidarity-based risk distribution model like those in France and Spain. The impacts of climate change on flooding will be concentrated in the highest risk areas, thereby limiting the appeal of distributing the costs to other policyholders. **Ensuring that the FIP has the right incentives for risk reduction in the areas that need it most will generate the greatest public value while managing climate change risk.**

2. DISASTER RISK REDUCTION: INCREASING ACCOUNTABILITY AND ACCESS TO INFORMATION WHILE LIMITING DISASTER FINANCIAL ASSISTANCE (DFA)

The FIP will not be sustainable unless it is coupled with a concerted effort to strengthen public accountability within Canada's approach to disaster risk reduction. The FIP allocates risk to individual policyholders through a contract that promises to pay out in the event of a loss. Once households and communities are aware of the cost of this risk, they can choose how to manage it via investments in mitigation, relocation, or even self-insurance if they have sufficient resources.

Canada's current approach to disaster financial assistance (DFA) undermines accountability because national and provincial funds are used to fund recovery for households and communities regardless of whether they have made efforts to reduce risk. DFA programs specifically exclude insurable losses, but this provision is easily ignored by elected officials under pressure from voters. Moreover, DFA programs specify that properties must be restored to pre-disaster conditions, thereby using public dollars to rebuild in high-risk areas. These characteristics of DFA programs undermine the incentives to invest in property- and community-level risk reduction that might otherwise be generated by the FIP.

To maximize the efficient use of public funds, the Government of Canada must build on the recommendations recently made by the Expert Advisory Panel on the Disaster Financial Assistance Arrangements. Specifically, that properties with access to insurance after the implementation of the

FIP should no longer be eligible for DFA. **Limiting this eligibility means that recovery funding will not be wasted on rebuilding in high-risk areas, a current practice that sets the stage for repetitive losses.**

FIP-induced savings to federal and provincial DFA programs could be directed towards retrofitting homes or investing in community level flood mitigation. Moreover, since approximately 90,000 homes contribute to 40% of the flood risk in Canada, strategic retreat from the highest risk areas through targeted property buyouts could permanently eliminate some of the economic liability of both DFA programs and the FIP.[3]

Another pressing priority is to improve risk awareness among Canadians. Surveys conducted by our research team in 2016 and 2021 showed that only 6% of Canadians living in high risk areas are aware of their vulnerability to flooding (Thistlethwaite et al. 2020). This awareness gap suggests the FIP could struggle to generate demand. The 2023 federal budget funded the creation of a publicly accessible online portal where Canadians could access information on their exposure to flooding. A clear visual representation of flood risk, combined with transparent information on the real rate of risk faced by households in these communities, could empower Canadians to put pressure on governments to prioritize risk reduction (See Figure 2).

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3   One approach is to permit access to DFA to pay for damages up to a lifetime cap (i.e. the maximum allowed under most provincial DFA plans) in a similar approach adopted by Quebec.

# 3. INSURANCE INNOVATION: LEVERAGING FIP TO INCREASE DATA ACQUISITION AND SHIFT TO COMMUNITY BASED MODEL

Although the proposal for the FIP remains narrowly focussed on addressing the protection gap in high-risk flood areas, entering the insurance market could also be an opportunity for the Government of Canada to explore new technologies and coverage models that create market benefits beyond households living in high-risk flood areas. Insurers typically adopt a conservative approach to coverage pricing and availability. Uncertainty about the benefits of new data or coverage models, and concern that innovation could invite regulatory scrutiny, drive the industry to maintain business-as-usual practices, with potentially negative effects. For example, due to the high costs of acquiring data with sufficient resolution to capture the construction of infrastructure that reduces risk (e.g. investment in higher capacity storm sewers, dikes), premiums in some areas could be priced higher than they should be (Minano et al. 2021).

Since it does not face the same competitive market pressures, the FIP presents an opportunity to leverage federal investments in data acquisition and the use of technologies such as LiDAR, GIS, and Synthetic Aperture Radar (SAR) to improve the accuracy of risk models. SAR, for example, can use satellite data to confirm the completion of flood defenses and thereby update flood risk models more frequently. Similarly, artificial intelligence can be used to examine satellite or citizen-generated data to confirm whether a property owner has taken measures to reduce risk.

Figure 2: Example of transparent flood risk disclosure
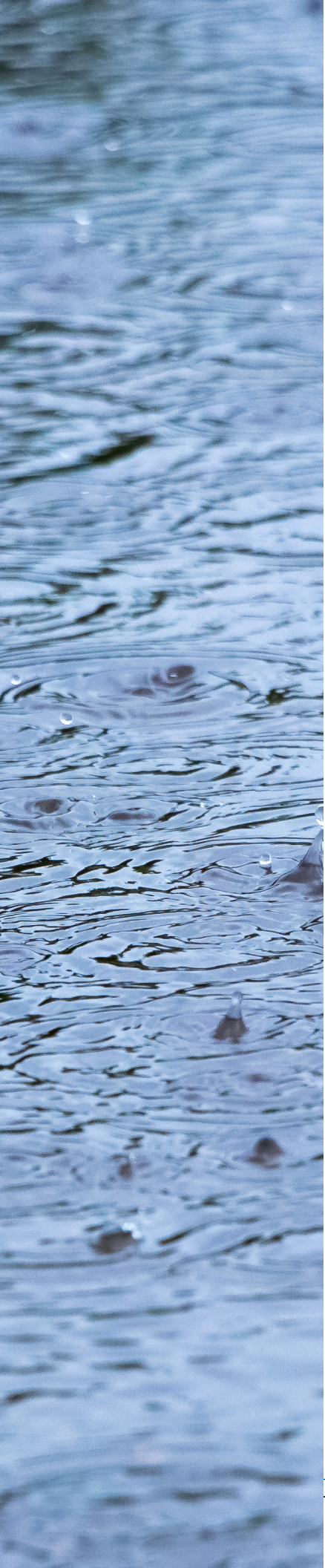
This innovative use of technology in insurance—dubbed "insurtech"—could help the FIP create a data hub that demonstrates how it is adjusting premiums in real-time in response to government investment. **More formally, the FIP approach to risk rating could inform the design of a Canadian version of the U.S. Community Rating System,[4] which rewards local investment in risk reduction through reduced premiums for all households in a community.**

In addition to benefiting existing policyholders, the FIP can adopt strategies that promote inclusive insurance coverage for traditionally marginalized or underserved populations, since flood risk and socioeconomic vulnerability are generally clustered in the same locations (Chakraborty et al. 2022). Barriers such as renting rather than owning a property, a poor credit score, or limited time and resources to negotiate an insurance contract can lead to underinsurance. Evidence from the U.S. shows that disasters in these communities can lead to a "downward spiral" where people are forced to either relocate, take significant time off work, or use their own savings for recovery, leading to mortgage delinquencies and other economic problems (Kousky and French 2022).

Adjusting the scale of coverage from the individual to community level is one proposed solution that could counter these barriers. For example, the FIP could negotiate on behalf of a community to develop a parametric insurance product in which a claim is paid out if a hazard surpasses a contractually defined "trigger" (e.g., a flood exceeds the 1-in-100-year mark), rather than basing it on the cost of damage (Mims 2023). This parametric model reduces the cost and processing time of claims administration since it does not require a loss adjustor to visit each affected property. It also benefits renters by covering temporary moving costs or the higher rents that often result from a disaster because of housing shortages. Parametric insurance of this kind is well-suited to address underinsurance in Indigenous communities where an insecure housing stock and community-ownership of property limit private sector supply (Safitri 2022).

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4   The U.S. Community Rating System, operated by the Federal Emergency Management Agency, rewards communities that voluntarily implement measures to reduce flood risk by reducing National Flood Insurance Program premiums for all homes within the designated area (FEMA 2018).

FIP POLICY OPPORTUNITY

Canada's Flood Insurance Program provides a unique opportunity to improve the availability and affordability of property insurance as threats from climate change continue to rise.

IMPROVING FLOOD RISK COVERAGE

1.   Adopt flexible, risk-based pricing that minimizes exposure to the increasing costs of climate change.

2.   Strengthen disaster risk reduction by prohibiting the use of funds for rebuilding in high-risk areas, buyout high risk properties, and increasing information on Canadians exposure to risk.

3.   Leverage the FIP to increase innovation in insurance markets by improving data acquisition and models to lower costs and customize solutions for underserved communities.

POLICY RECOMMENDATIONS

The Government of Canada has responded to a growing protection gap in high-risk flood areas with a pledge to create a flood insurance program to ensure affordable coverage. This brief has outlined several considerations for policymakers seeking to maximize the public value of the FIP while managing the growing costs of climate change. The following are some specific policy recommendations that extend from this analysis.

1.   ADOPT FLEXIBLE, RISK-BASED PRICING THAT MINIMIZES EXPOSURE TO THE INCREASING COSTS OF CLIMATE CHANGE.

Rather than simply distributing the cost of affordable insurance across all taxpayers, the FIP should adopt a risk-based approach that encourages risk reduction. Strategies such as informing policyholders in high-risk areas about the market price for insurance and using a schedule to lower the subsidy over time will encourage risk reduction, discourage development in risky areas, and ensure public funds are used efficiently and in ways that contain the costs of climate change.

2.   STRENGTHEN DISASTER RISK REDUCTION BY PROHIBITING THE USE OF FUNDS FOR REBUILDING IN HIGH-RISK AREAS, BUYOUT HIGH RISK PROPERTIES, AND INCREASING INFORMATION ON CANADIANS EXPOSURE TO RISK.

The FIP is unlikely to be effective if the incentives it generates for risk reduction are undermined by Canada's fragmented approach to disaster risk management. DFA programs must adopt clear rules that explicitly prohibit the use of funds for rebuilding in high-risk areas.

Public funds should be used to encourage risk reduction, such as prioritizing buyouts for the small number of properties that inflate the FIP's economic liability. These reforms, combined with an aggressive campaign to inform Canadians about their exposure to risk, will mobilize political support for prioritizing investments in risk reduction and limit the impact of climate change on insurance affordability.

3. LEVERAGE THE FIP TO INCREASE INNOVATION IN INSURANCE MARKETS BY IMPROVING DATA ACQUISITION AND MODELS TO LOWER COSTS AND CUSTOMIZE SOLUTIONS FOR UNDERSERVED COMMUNITIES.

Despite its fairly narrow objective to improve the availability and affordability of property insurance coverage, the FIP can also be leveraged to generate benefits for households in low- or moderate-risk areas and to expand coverage for economically vulnerable populations. Specifically, the FIP could be used to harness technology, alternative modelling strategies, and data generation to encourage private insurers to account for property- and community-level investments in risk reduction. The FIP could also be leveraged to provide coverage to renters or other groups that experience underinsurance. These benefits will strengthen political support for the FIP beyond those property owners who benefit directly through their participation with the potential of expanding insurance even as climate change risk increases.

CONCLUSION

The Government of Canada's FIP initiative is a significant opportunity to buttress the availability and affordability of property insurance as the threats from climate change grow. If the program is designed to maximize disaster risk reduction, it will achieve this central objective in addition to other benefits. More work is needed to understand these benefits as they can be promoted to increase the public value of FIP. For example, the FIP will help create public knowledge about areas where housing should, and should not, be built as governments seek to increase supply. Similarly, the FIP could help households struggling with the high cost of living by reducing some of their monthly insurance bills.

REFERENCES

Chakraborty, Liton, Jason Thistlethwaite, Daniel Scott, Daniel Henstra, Andrea Minano, and Horatiu Rus. 2022. "Assessing Social Vulnerability and Identifying Spatial Hotspots of Flood Risk to Inform Socially Just Flood Management Policy." Risk Analysis, June, risa.13978. https://doi.org/10.1111/risa.13978.

Copley, Michael, Rebecca Hersher, and Nathan Rott. 2023. "How Climate Change Could Cause a Home Insurance Meltdown." NPR, July 22, 2023. https://www.npr.org/2023/07/22/1186540332/how-climate-change-could-cause-a-home-insurance-meltdown.

FEMA. 2023. "NFIP's Pricing Approach." Federal Emergency Management Agency. April 1, 2023. https://www.fema.gov/flood-insurance/risk-rating.

Flood Re. 2018. "Our Vision: Securing a Future of Affordable Flood Insurance." London: Flood Re. https://www.floodre.co.uk/wp-content/uploads/2018/07/Flood_Transition2018_AW.pdf.

Kousky, Carolyn, and Karina French. 2022. "Inclusive Insurance for Climate-Related Disasters: A Roadmap for the United States." Boston, MA.

Mims, Christopher. 2023. "Climate Change Is Breaking Insurance. Here's How Tech Could Save It." The Wall Street Journal, December 8, 2023. https://www.wsj.com/business/entrepreneurship/climate-change-ai-california-texas-insurance-1d993873.

Minano, Andrea, Jason Thistlethwaite, Daniel Henstra, and Daniel Scott. 2021. "Governance of Flood Risk Data: A Comparative Analysis of Government and Insurance Geospatial Data for Identifying Properties at Risk of Flood." Computers, Environment and Urban Systems 88 (1): 101636. https://doi.org/10.1016/j.compenvurbsys.2021.101636.

Public Safety Canada. 2022. "Adapting to Rising Flood Risk: An Analysis of Insurance Solutions for Canada." Ottawa, ON: Government of Canada. https://www.publicsafety.gc.ca/cnt/rsrcs/pblctns/dptng-rsng-fld-rsk-2022/dptng-rsng-fld-rsk-2022-en.pdf.

Safitri, Dian Maya. 2022. "Putting Indigenous Peoples on the Path of Adaptive Social Protection," November 15, 2022. https://ari.nus.edu.sg/ariscope/putting-indigenous-peoples-on-the-path-of-adaptive-social-protection/.

Shingler, Benjamin. 2024. "A Quebec Lender Opted out of Mortgages in Flood Zones. Experts Warn It Could Happen Elsewhere," March 4, 2024. https://www.cbc.ca/news/climate/quebec-desjardins-flooding-mortgage-1.7129986.

Thistlethwaite, Jason, Daniel Henstra, Craig Brown, and Daniel Scott. 2020. "Barriers to Insurance as a Flood Risk Management Tool: Evidence from a Survey of Property Owners." International Journal of Disaster Risk Science 11 (3): 263–73. https://doi.org/10.1007/s13753-020-00272-z.