

Flood Risk Governance in a Changing Climate

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Foley Restoration via Twitter



Ashley Burke, CBC News

2017 floods in Bradford, Ottawa-Gatineau



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Canadian Coastal Resilience Forum



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Canada's flood governance gap

Unless responsibilities are arranged and legitimately justified:

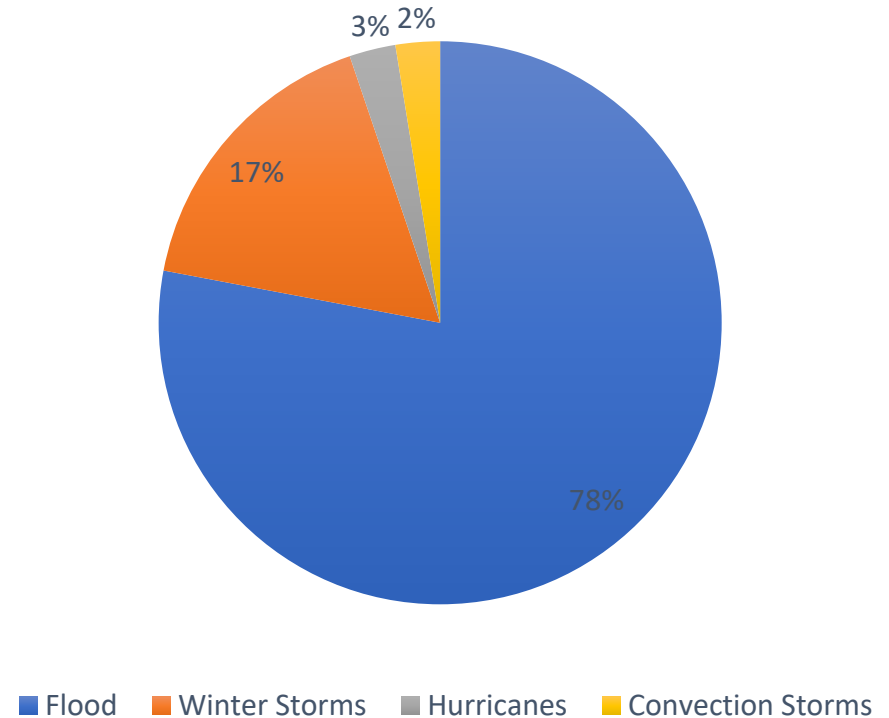
1. Risk reduction strategies are ineffective
2. Risk reduction faces political opposition



Why flood risk?

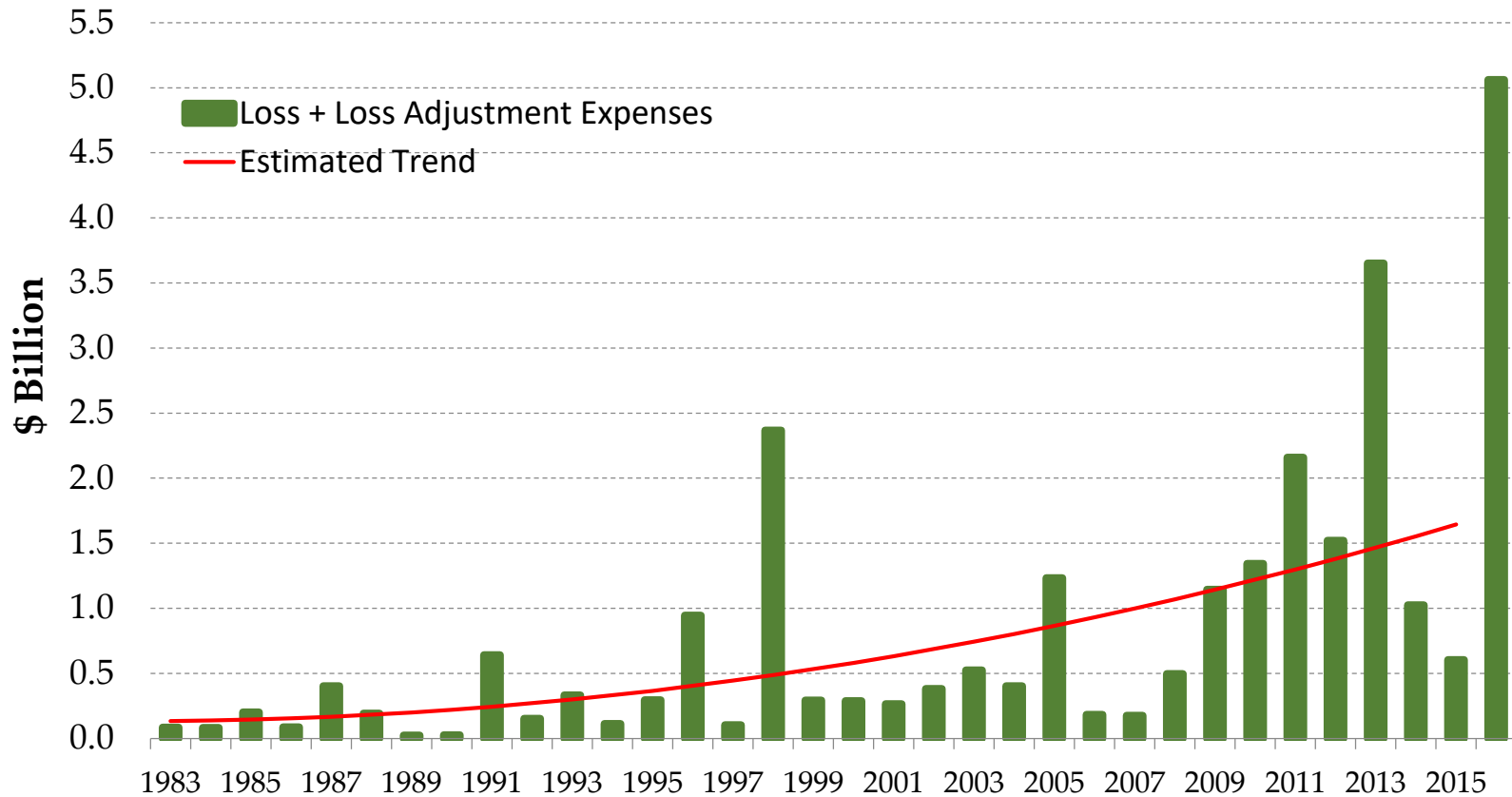
- Most costly and frequent hazard
- Increasing costs, esp. urban flooding
- Outdated defenses
- Unsustainable disaster assistance and insurance costs
- Legal liability growing

Historical DFAA Payments by Catastrophe 1970-2014



(CAD \$millions CDN; adapted from PBO 2016)

Why flood risk?



Source: IBC Facts Book, PCS, CatIQ, Swiss Re, Munich Re & Deloitte
Values in 2015 \$ CAN

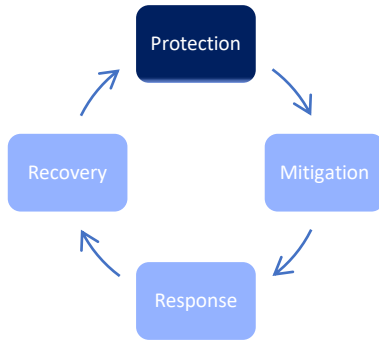
Flood risk management (FRM)

Policy Emphasis

Design

Example

Flood Management



Historical likelihood of hazard (1-in-100 year)



Flood Risk Management

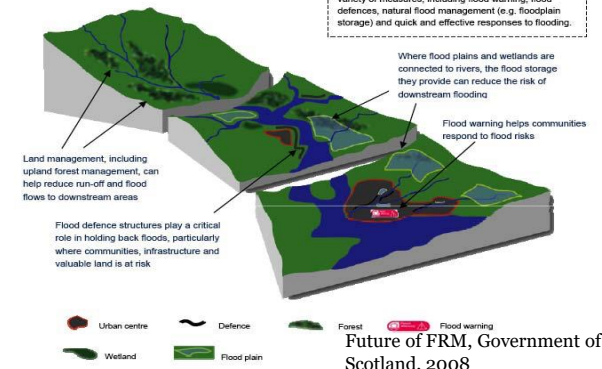


Risk (hazard likelihood; exposure & vulnerability)

Sustainable Flood Management

Sustainable flood management is an approach to planning and delivering measures to reduce flood risk.

Increasing resilience to flood risk is an important component of sustainable flood management. Resilience to flooding can be increased through a variety of measures, including flood warning, flood defences, natural flood management (e.g. floodplain storage) and quick and effective responses to flooding.

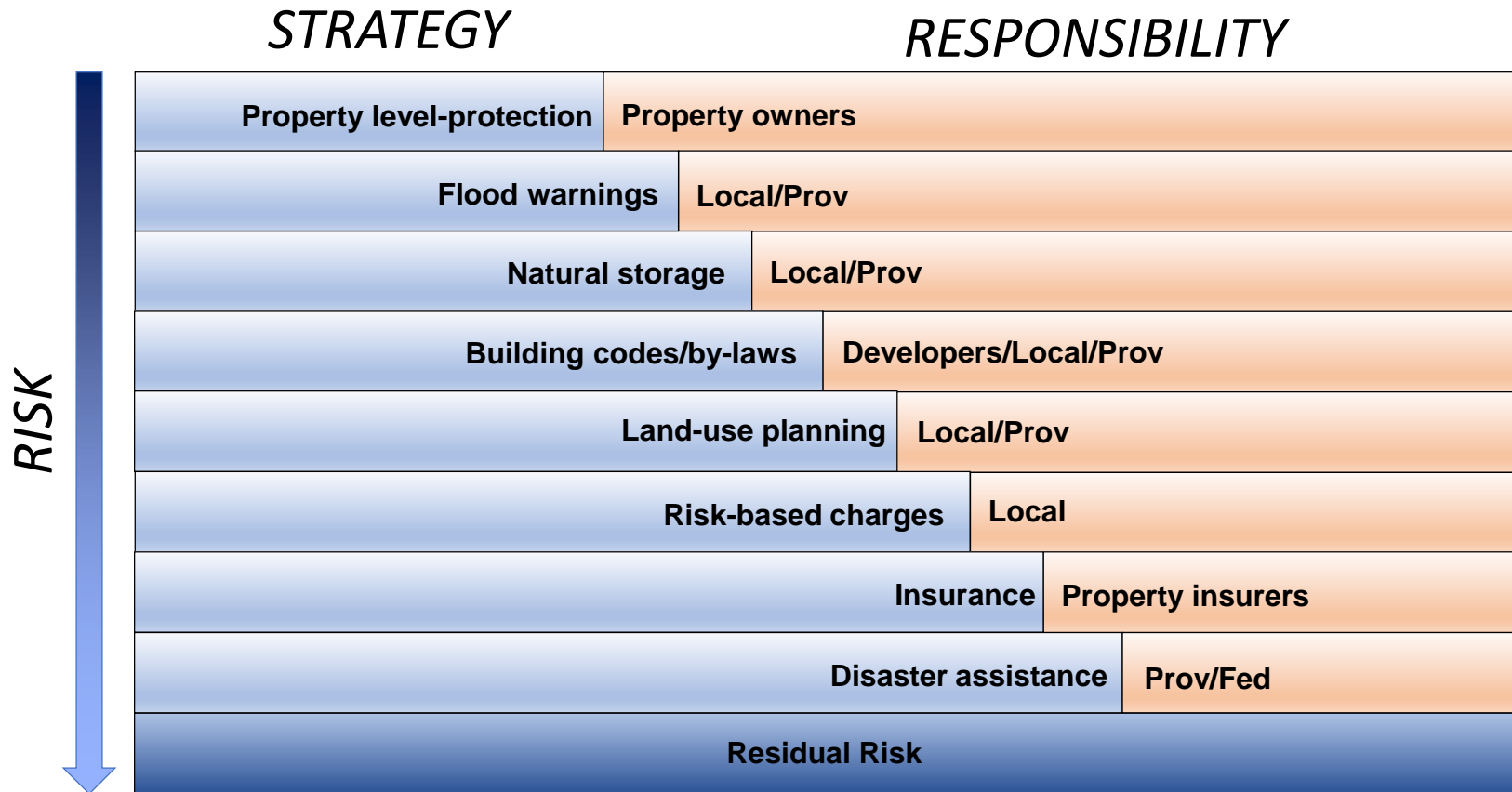


Principles of FRM



1. Absolute protection impossible
 - Equal priority between protection, mitigation, response and recovery
2. Manage consequences
 - Risk assessment includes exposure, vulnerability in addition to hazard
3. Portfolio of instruments
 - Multiple tools to reduce and share responsibility
4. Share responsibility
 - Property owners, businesses, developers, governments

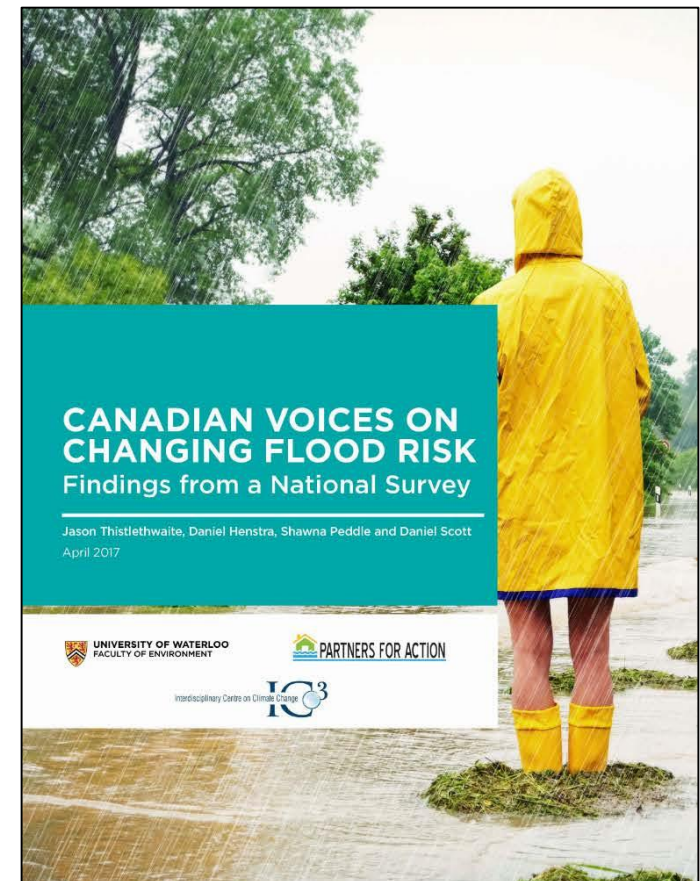
Who should do what, and why?



Should property owners be responsible for flood risk?

Responsibility passed down to homeowners and municipalities

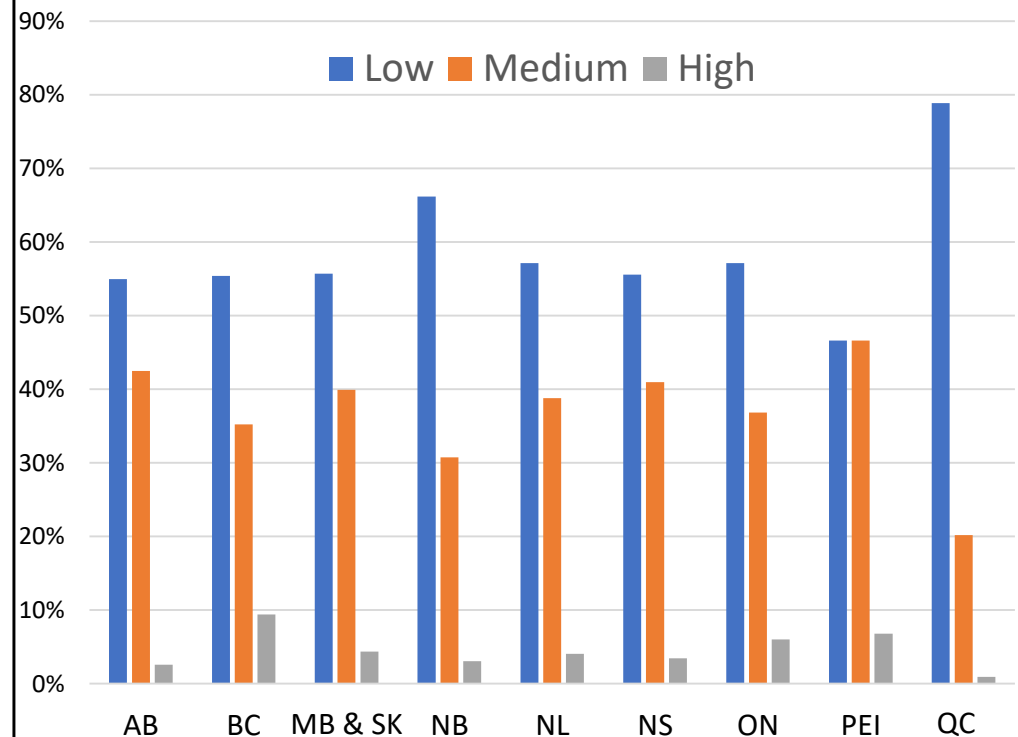
- Federal disaster assistance less available
- Flood insurance new in Canada (but not in high-risk areas)
- Encouraging property-level flood protection (e.g. subsidies, by-laws).



Property owners are not effective flood risk managers

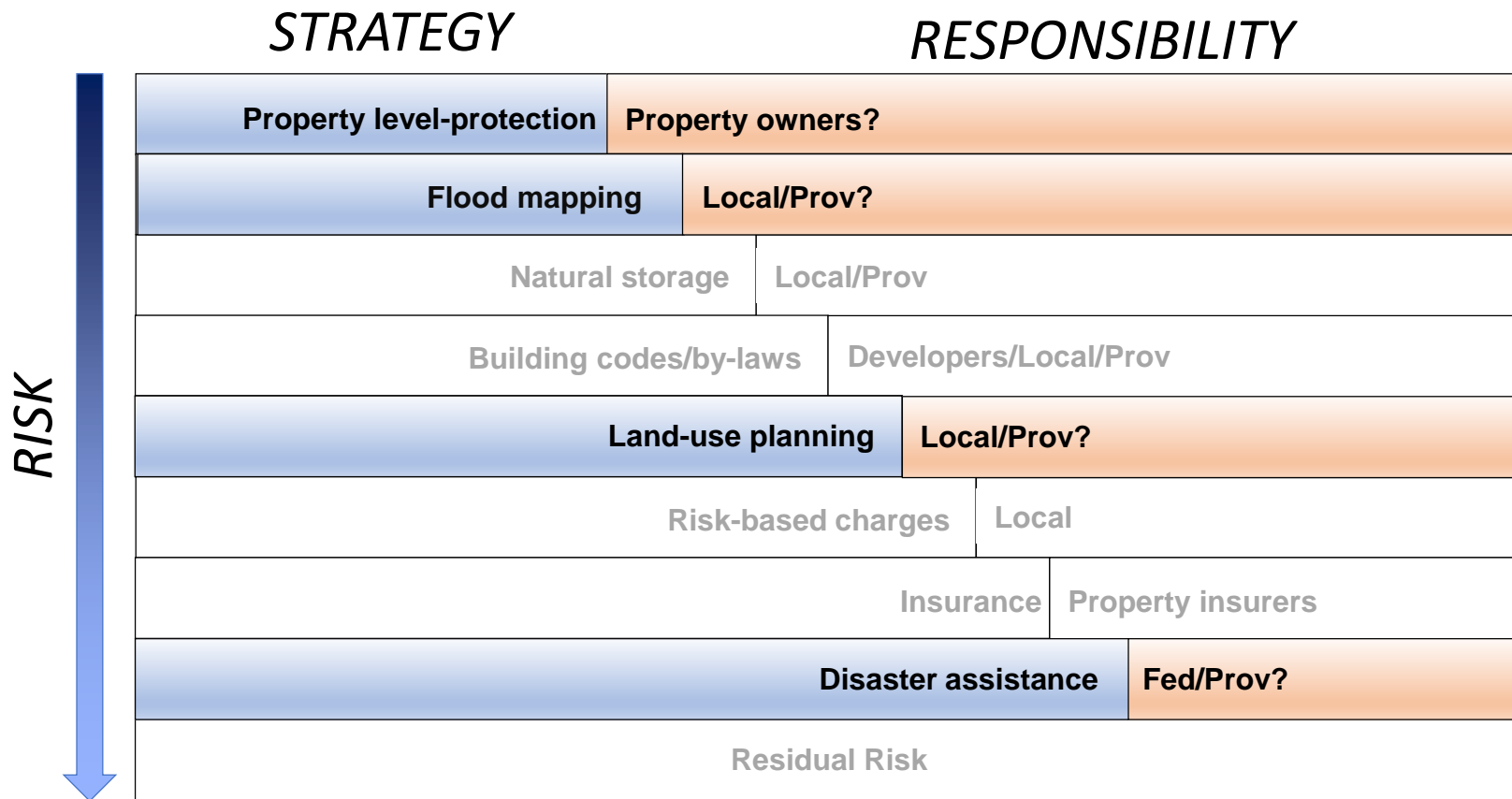
- 94% unaware they live in high risk areas
- Less than 30% protect their property.
- Insufficient willingness-to-pay for insurance and protection

How concerned are you about flood risk to your current home?



*these respondents live in high risk areas


The *Who* Gap



Re-imagining responsibility

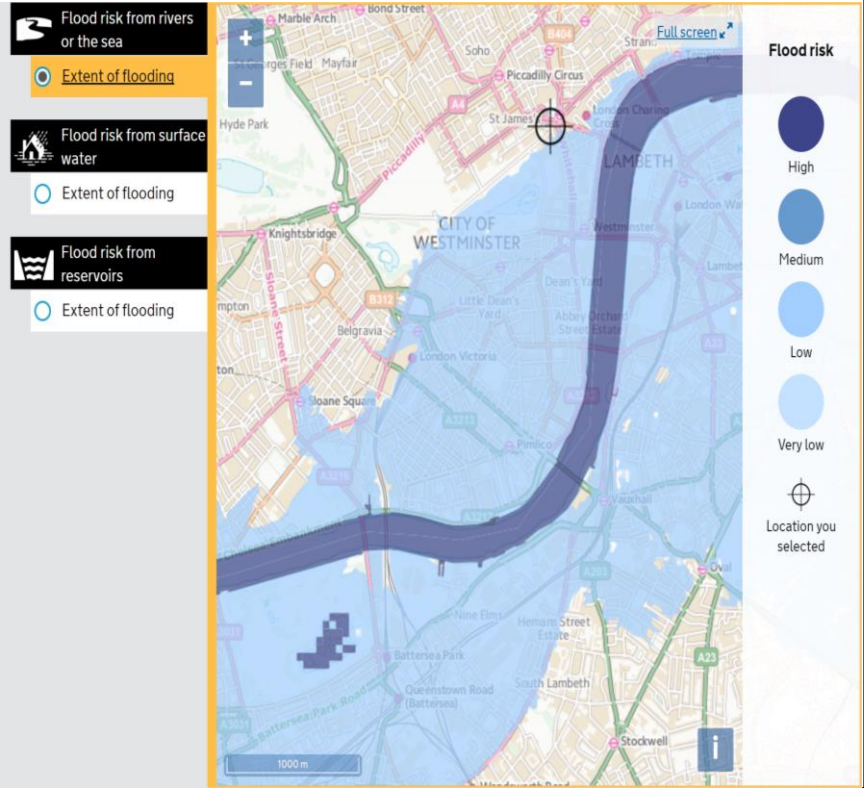
CANADA:

Getting lost looking for a flood map for Pierrefonds

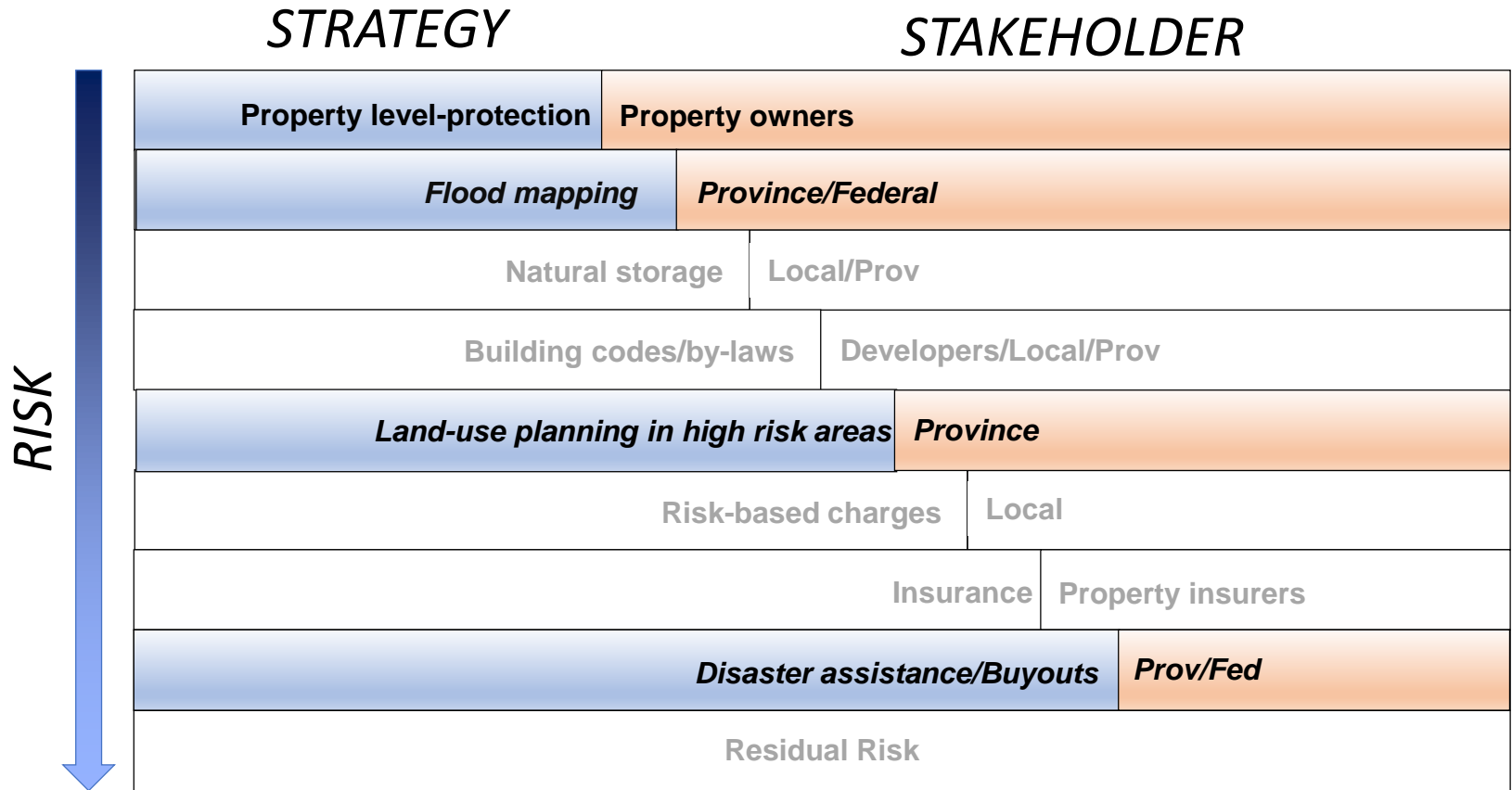
 **CATHERINE SOLYOM, MONTREAL GAZETTE**
More from Catherine Solyom, Montreal Gazette ([HTTP://MONTREALGAZETTE.COM/AUTHOR/CSOLYOM](http://montrealgazette.com/author/csolyom))
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UNITED KINGDOM:



Re-imagining responsibility



Developing Canada's flood risk governance arrangements



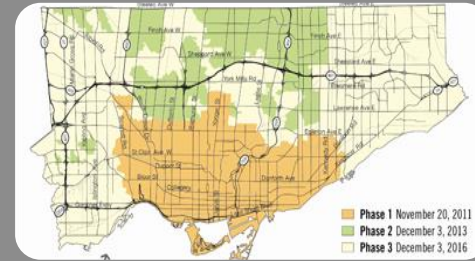
1. 3-D visualizations of flood risk

- How is flood risk changing?



2. Risk dialogues

- Who should be responsible?



3. Risk strategies

- What strategies are suitable for different stakeholders?

Instrument analysis



- Tools of governance to influence behavior
 - share responsibility and costs
 - reduce risk (exposure, vulnerability in addition to hazard)
- Specific focus on municipal government

land use planning	restrictions on development in flood risk areas
development criteria	conditions on building permits to minimize flood risk
green infrastructure / LID	retaining water on site (swales, permeable surfaces, etc)
stakeholder engagement	collaboration with stakeholders affected by decisions or who have capacity to implement
flood mapping	graphic illustration of at-risk areas
flood warning system	alerting residents about impending flood threats
flood hazard disclosure	informing buyers about a property's flood risk
corrective tax	tax that discourages risky behavior
stormwater charge	fee proportionate to property's contribution to flood risk
subsidies	financial support for property level flood protection
credits	reduction of financial obligation in exchange for risk mitigation
compassionate grants	financial support for victims
property buy-outs	public purchase of properties in flood-prone areas
special surcharge	fee added to property tax to fund flood mitigation initiatives

Instrument analysis

effectiveness	degree to which instrument achieves objectives
technical feasibility	sufficient data and expertise to implement
political feasibility	support from politicians and community interests
economic efficiency	economic benefits outweigh costs
equity / fairness	fairly distributes benefits and burdens
administrative operability	resources required to implement
coherence	aligns with other policy objectives
flexibility	reversibility of instrument and effects



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Canadian Coastal Resilience Forum

uwaterloo.ca/ccrf

[@coastriskcanada](https://twitter.com/coastriskcanada)



Marine Environmental Observation
Prediction and Response Network

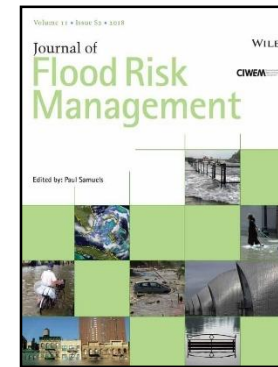
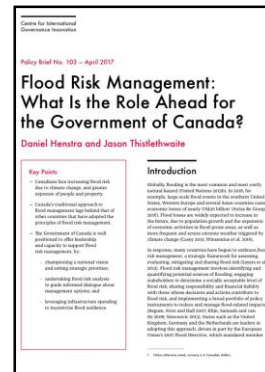
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National Flood Risk Roundtable, 2017/11



CANADIAN WATER NETWORK
RÉSEAU CANADIEN DE L'EAU