

Hydrogéomorphologie et gestion intégrée du risque d'inondation

Pascale Biron



Calgary, 2013



Gatineau, 2017



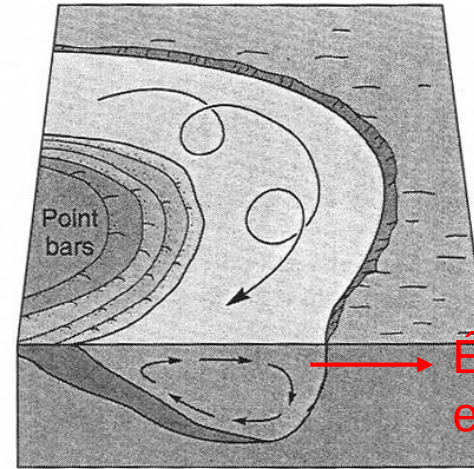
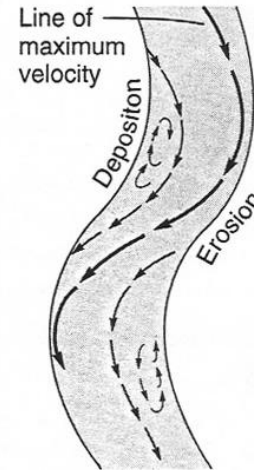
Montréal, 2017



Houston, 2017

Hydrogéomorphologie: deux éléments clés de la dynamique naturelle des cours d'eau

- Les rivières à méandres migrent latéralement

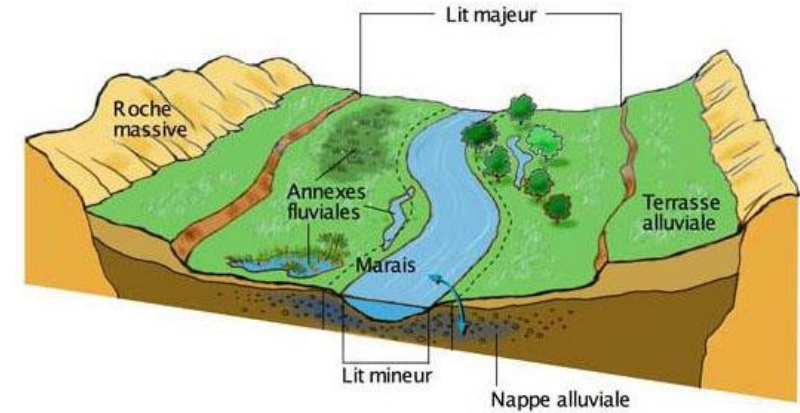
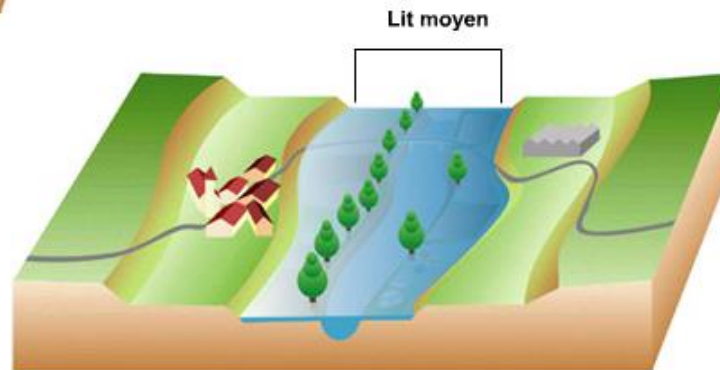
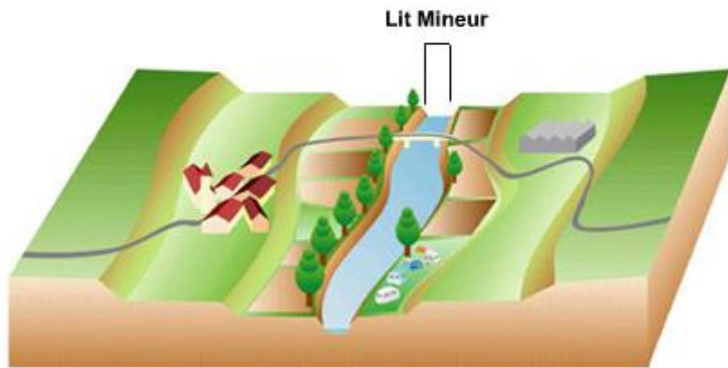


- Les rivières débordent de leur lit régulièrement

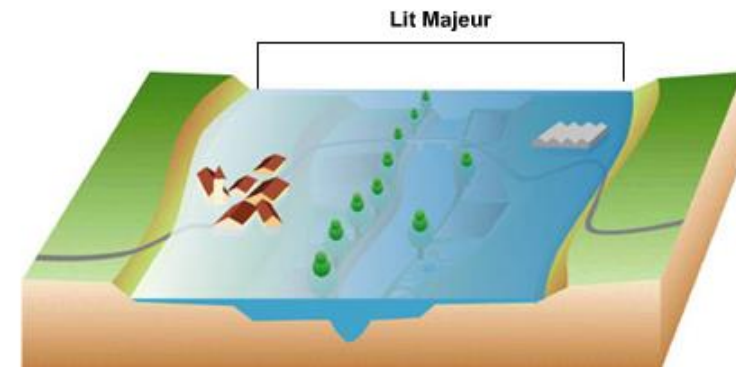
Niveau plein-bord atteint
à chaque 1,5 – 2 ans



Hydrogéomorphologie → Espace de liberté = Espace de mobilité + espace d'inondabilité...

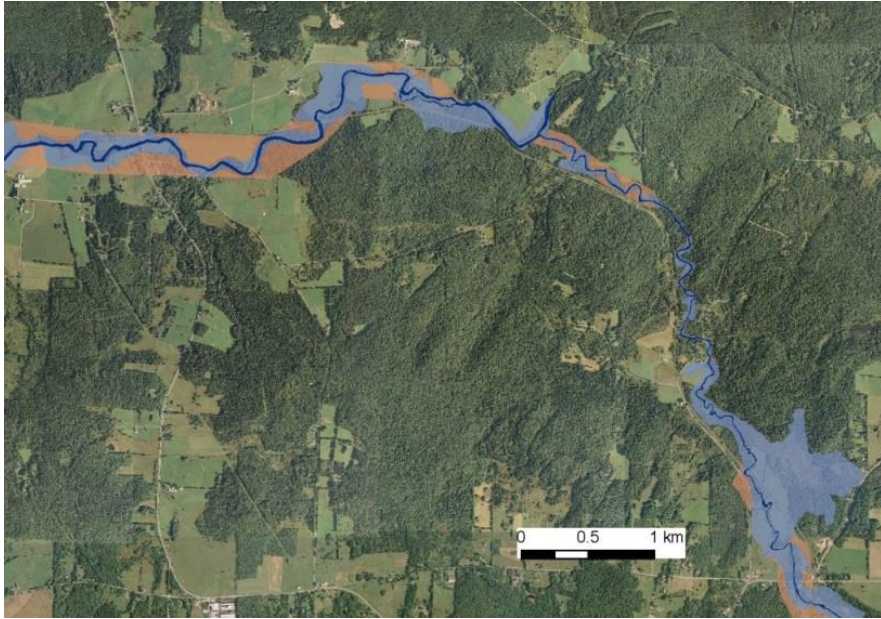


**+ milieux humides
(espace d'intégrité)**

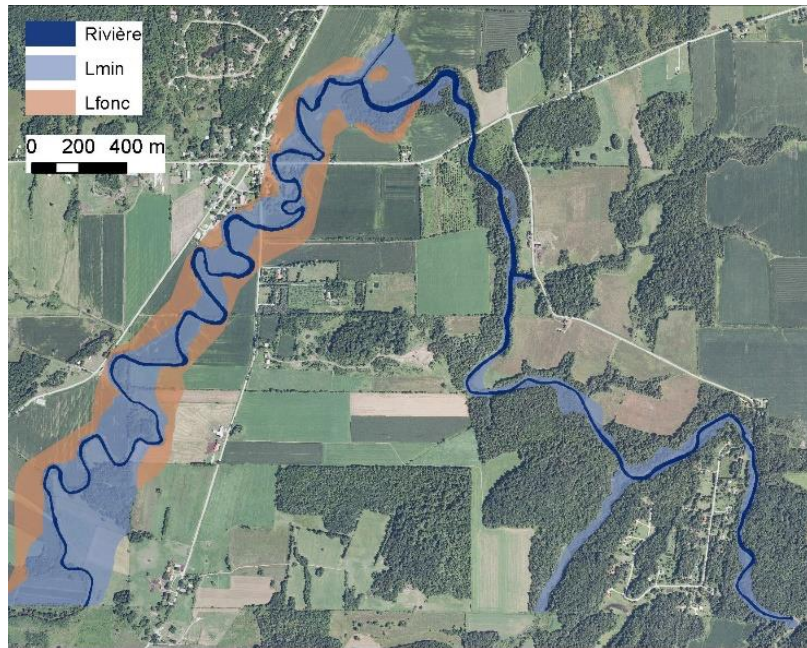


Espace de liberté des cours d'eau

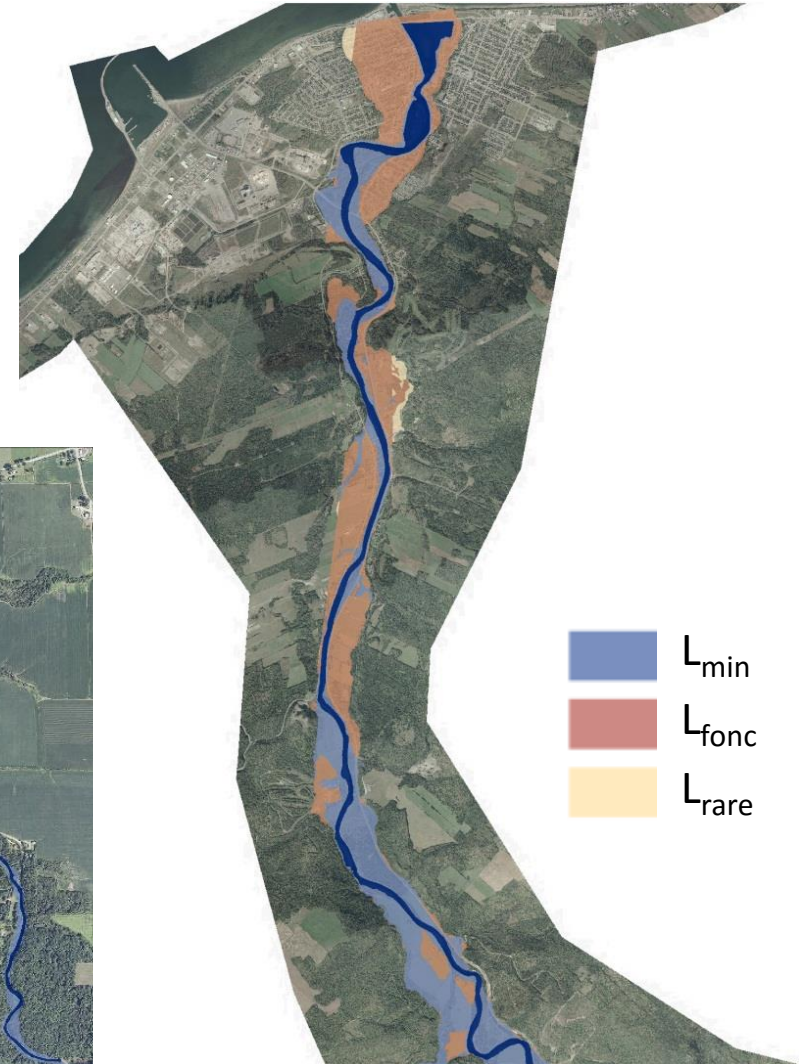
Rivière Yamaska Sud-Est (amont)



Rivière de la Roche



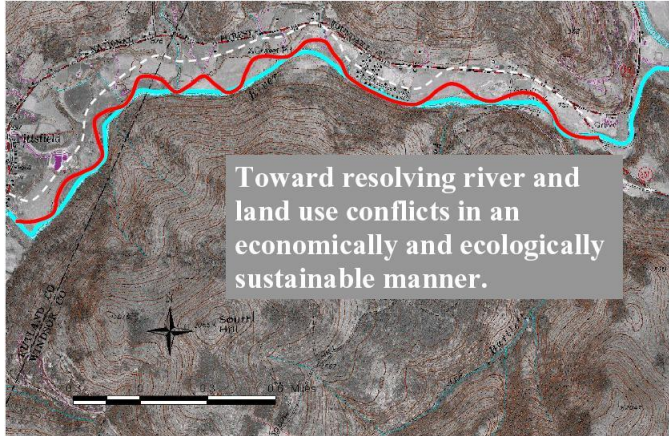
Rivière Matane (aval)



Réalisme du concept d'espace de liberté?

November 20, 2006

Alternatives for River Corridor Management Vermont DEC River Management Program



Defining and protecting the meander belt width corridor that will accommodate equilibrium conditions may be the most important objective in any river restoration project.

Making space for water

Taking forward a new Government strategy for flood and coastal erosion risk management in England

First Government response to the autumn 2004
Making space for water consultation exercise

March 2005



HM TREASURY

Office of the
Deputy Prime Minister
Creating sustainable communities

Department for
Transport

defra
Department for Environment
Food and Rural Affairs

Room for the River, Netherlands

Gallery

1 2 3 4 next



Aerial view of the River Rhine as it flows through Arnhem

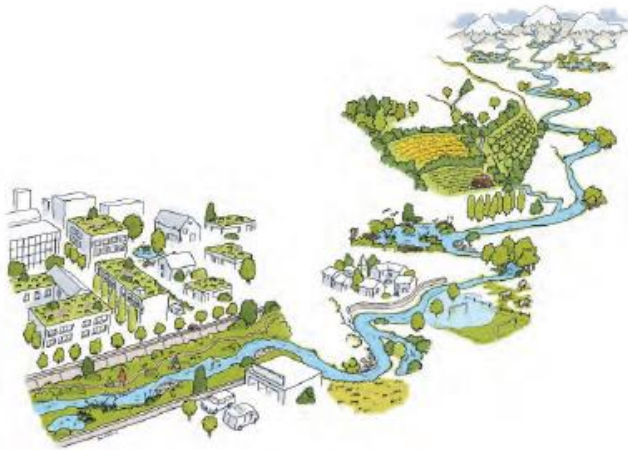
Innovative river management in the Netherlands

Realising that a totally new approach to river management must be applied, the Dutch government developed the Room for the River programme which is being implemented by the Ministry of Infrastructure and Environment. This programme will provide flood control by allowing Dutch rivers to expand naturally during periods of high flows at 39 project sites, and is expected to be completed by 2015.

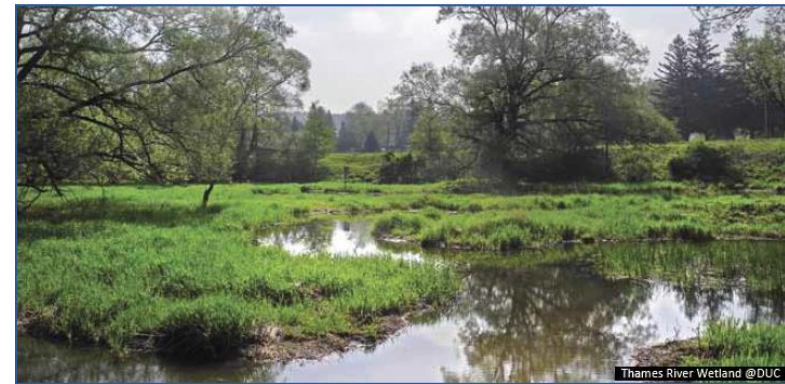
Budget de 2,3 milliards € aux Pays-Bas

Comment atténuer le risque d'inondation?

1. Retenir l'eau à la source (gestion à l'échelle du bassin-versant)



Rôle important
des milieux
humides riverains



2. Infrastructures vertes en milieu urbain

Exemple d'un parc urbain à
Dallas, conçu pour être inondé
de façon contrôlée



1) Retenir l'eau à la source

Working with Natural Processes to reduce flood risk The evidence behind Natural Flood Management



La directive
européenne
inondation

Depuis 2007



LOIRE
GRANDEUR NATURE



Number 396 December 2011

Natural Flood Management



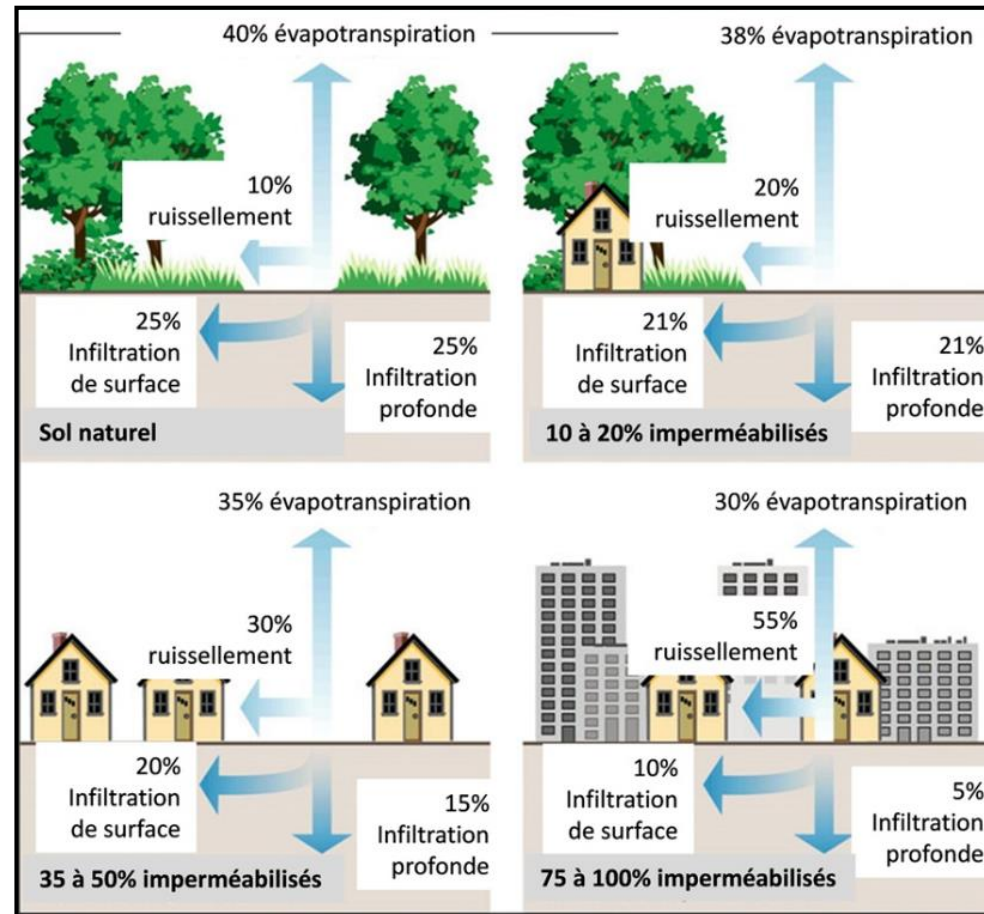
Natural flood management, defined here as the alteration, restoration or use of landscape features, is being promoted as a novel way of reducing flood risk. This POSTnote reviews the policy drivers of this approach, as well as the scientific basis, and implementation, of inland natural flood management strategies.

Overview

- The Flood and Water Management Act (2010) and Environment Agency Catchment Flood Management Plans promote working with natural processes where possible.
- Natural flood management (NFM) varies in its effectiveness, for example, water storage or flooding land are often more effective than changing land management practices.
- NFM can reduce erosion and benefit water quality, carbon storage & biodiversity. These positive effects may sometimes be more valuable than the reduction in flood risk.
- Collaboration between land-owners and communities is likely to be a key part of the success of NFM. Long-term funding measures or incentives, and better use of local knowledge, will also be important.

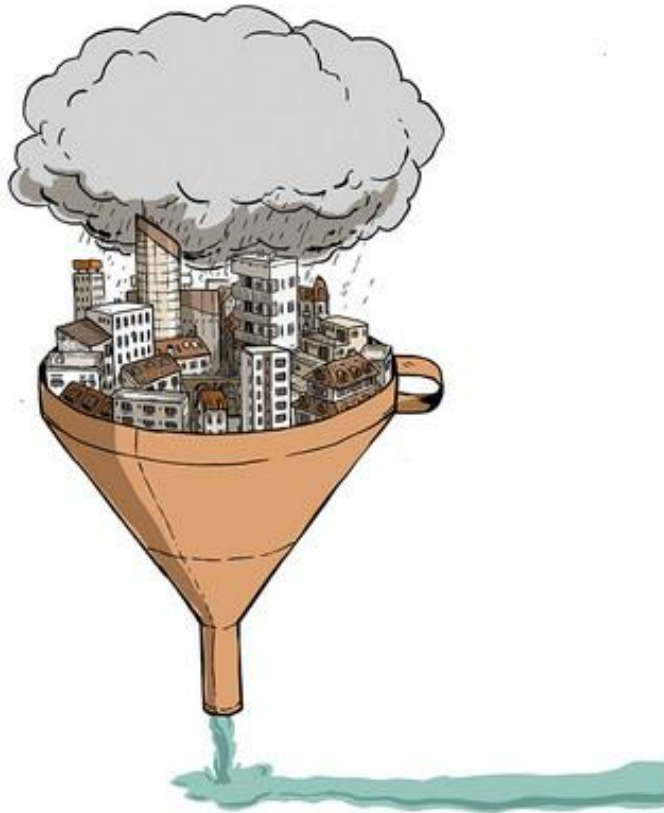
2) utilisation accrue des infrastructures vertes en milieu urbain

- Infiltration: facteur clé pour réduire les débits de pointe



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- Infiltration: facteur clé pour réduire les débits de pointe

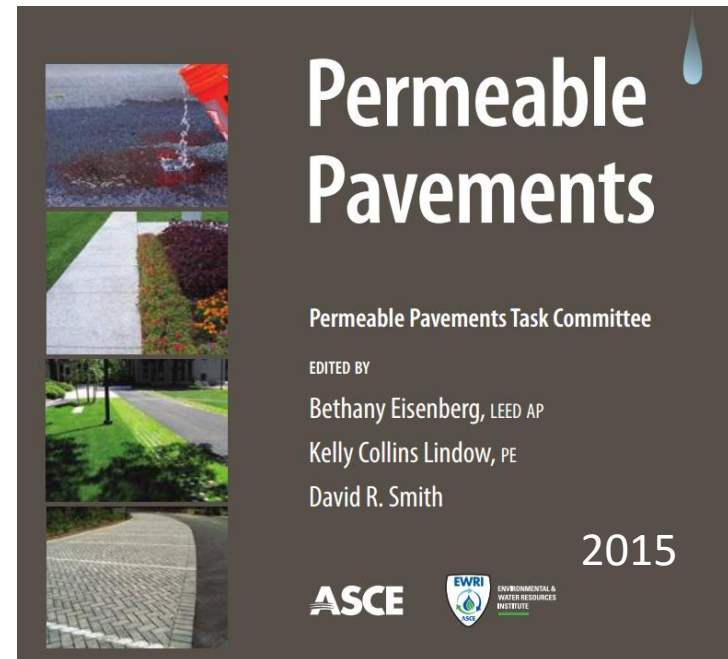


Chine: Concept de ville éponge



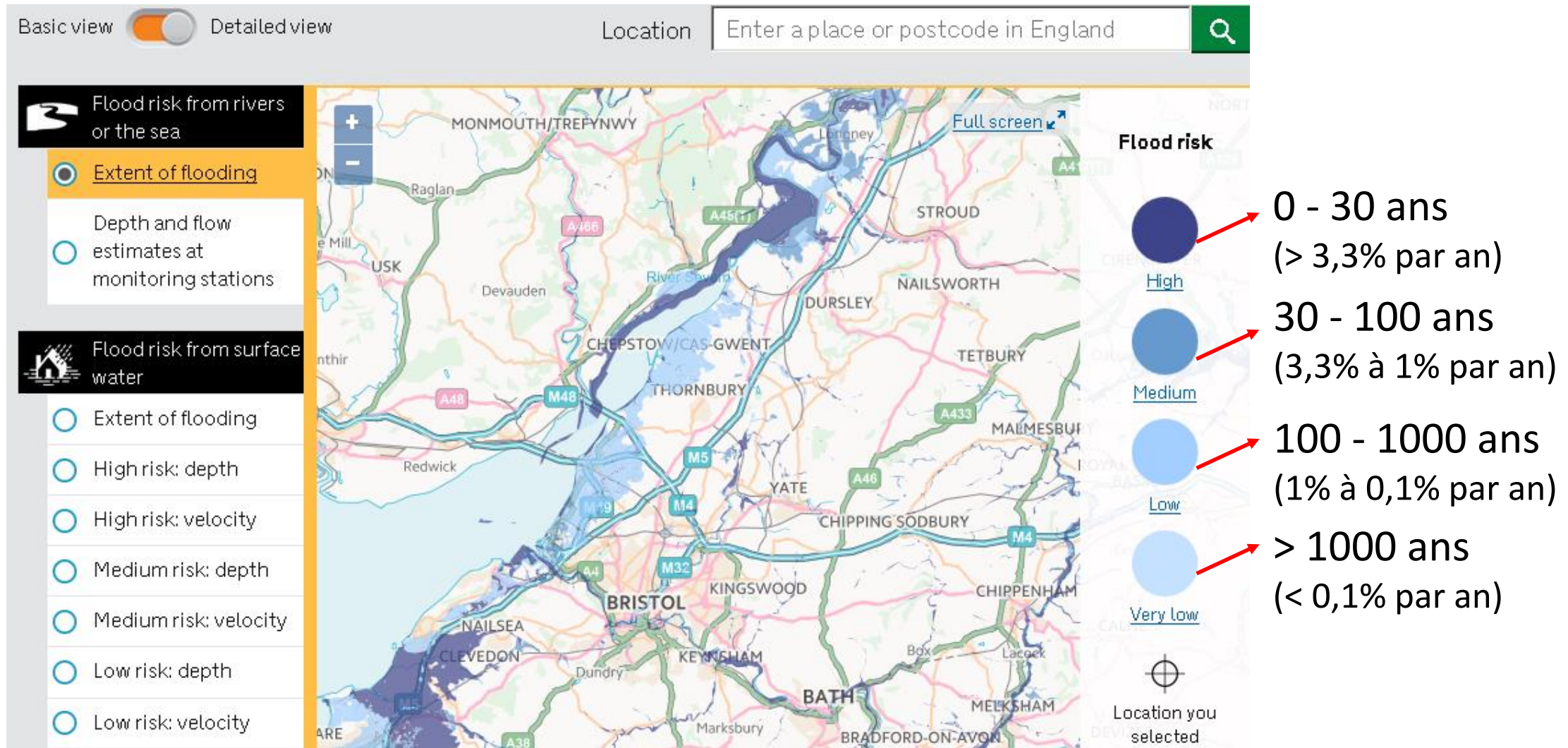
American Society of Civil Engineers

Asphalte poreuse



Rendre la cartographie intuitive et accessible

Angleterre



Inclure la profondeur pour bien documenter le risque pour la population

État du réseau routier

- Inondé
- Non inondé

État des infrastructures essentielles

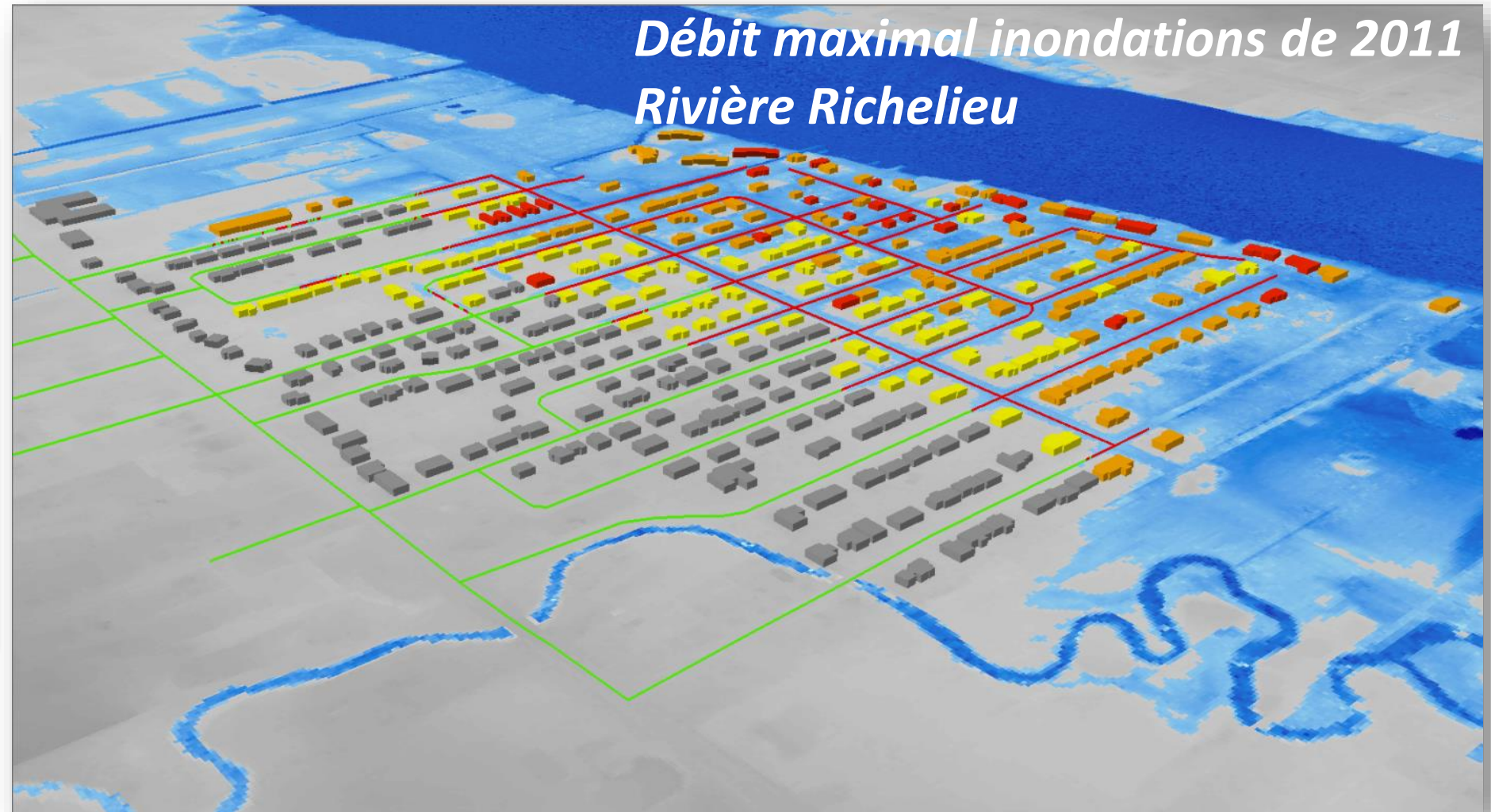
- Inondée
- Fonctionnelle (non inondée)

Niveau de risque pour la population

- Normal
- Sérieux
- Sévère
- Très sévère

Hauteurs d'eau (en mètres)

- Max : 1.92
- Min : 0



Rendre les villes plus résilientes: trame bleue verte

Flood Resilient Cities: *the Blue-Green Advantage*



Colin Thorne

University of Nottingham and KCB/ESA



bluegreencities.ac.uk

EPSRC
Pioneering research
and skills

Environment
Agency

RIVERS
Agency

GLOBAL
CITY
FOUNDATION

EPSRC Grant EP/K013661/1

Séoul (Corée du Sud)

Cheonggyecheon Canal



Conclusions

- Une gestion intégrée par bassin versant qui inclut les concepts hydrogéomorphologiques est essentielle pour mieux gérer les inondations
- L'applicabilité de plusieurs exemples inspirants, notamment en Europe avec la directive inondation depuis 2007, devrait être analysée au Québec
- Atténuation des inondations: pour chaque 1\$ investi en prévention, entre 3 et 5\$ économisés