

**INSPQ**

INSTITUT NATIONAL  
DE SANTÉ PUBLIQUE  
DU QUÉBEC

Centre d'expertise  
et de référence

santé

recherche

innovation

centre d'expertise et de référence

infectieuses

promotion de sair

santé environnementale

# Urban cool islands for public health

**Pierre Gosselin MD MPH**  
**Scientific coordinator, Climate and Health Program**

19 August 2015, US EPA Webinar

[www.inspq.qc.ca](http://www.inspq.qc.ca)

microbiologie

prom

urité et prévention des traumatismes

recherche

santé au tra

*Institut national  
de santé publique*

Québec





**This story is about how public health authorities can become leaders in urban planning and landscape design when nobody else is willing to do it 😊 , and yet remain within their marks and mandates...**

# Context



Québec's Action Plan on Climate Change 2007-2013  
(now renewed until 2020).

Funded by a carbon-intensive tax on hydrocarbons, based on volume, since November 2007 and later, the Carbon Exchange. About \$200 M/year. About 10% for adaptation, and 5 M \$/year for its health component.

Research; emergency preparedness (all extremes); prevention.

# Context



So a government and society-wide program made it easier to propose new approaches, including fighting UHI as a public health endeavor.

Total budget of 17 M\$ for the UHI component, over 5 years.

# Steps in implementation



1. Scientific basis
2. Tools
3. Pilot projects
4. Evaluation
5. Lessons learned
6. Repeat and avoid mistakes

# 1. Scientific basis: at risk populations



# 1. Scientific basis: at risk populations



**We prioritized materially and socially deprived areas, as they combine high exposure to heat through often poor quality dwellings, more work constraints, no pools, few parks, no cottage, poor air conditioning, and higher levels of chronic diseases.**

**And close to 100% live in UHIs...**

# 1. Scientific basis: What really works?

An extensive review of available options and their effectiveness (2009)



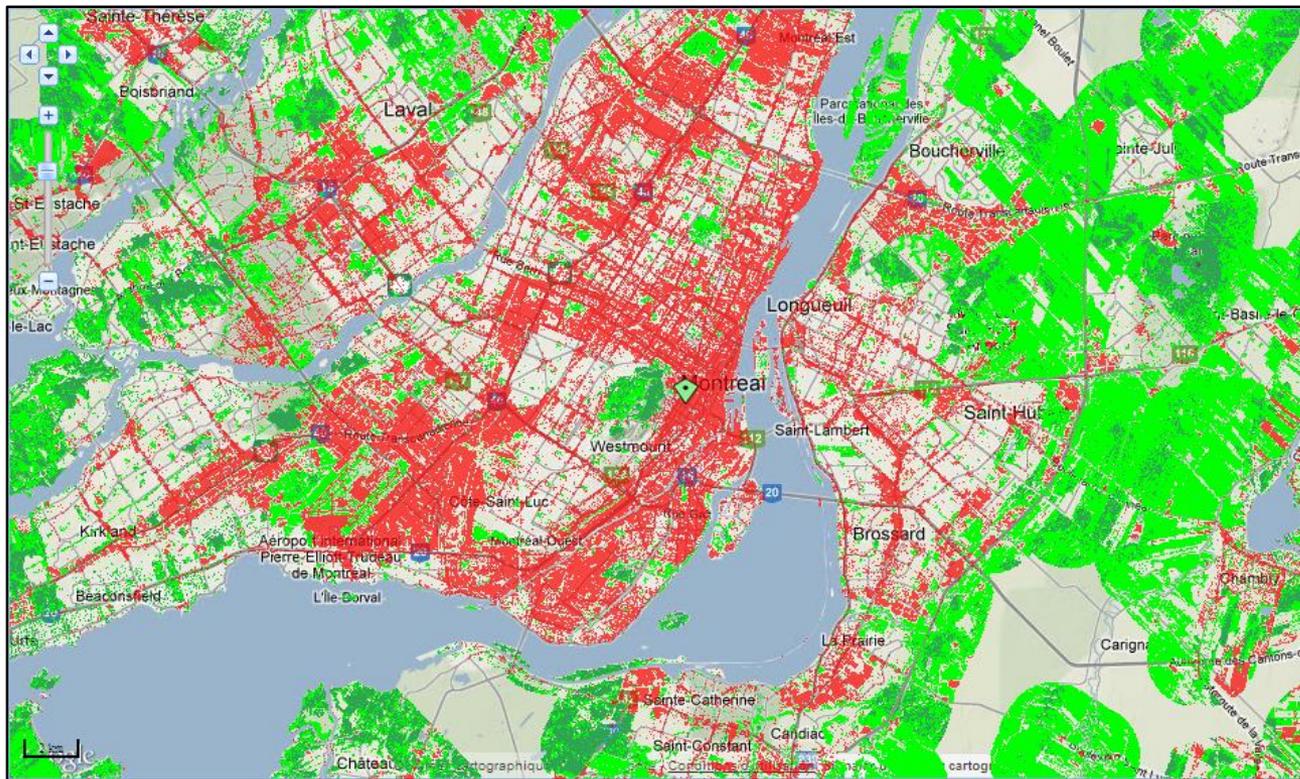
# 1. Scientific basis: What are the best options?

- Life cycle assessment of negative environmental impacts for various proposed measures (screening):
  - green roofs > high albedo membrane;
  - landscaping > vines or trees;
  - better management of rainwater best



## 2. Tools

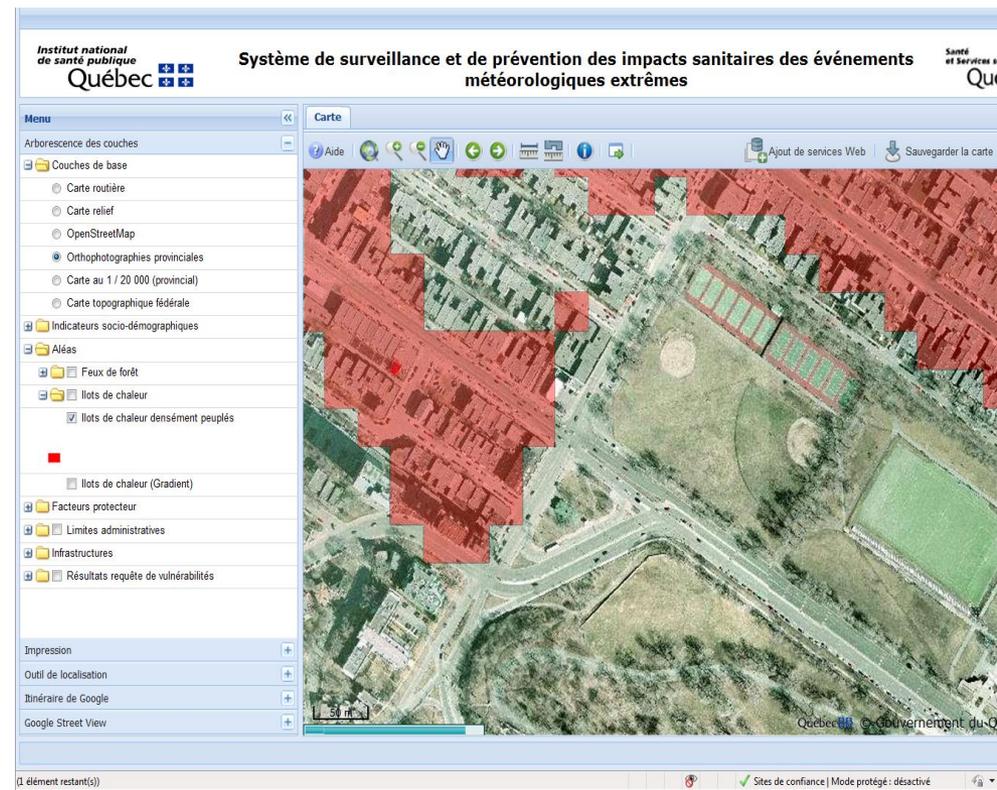
### Open data depository and web mapping tool



Landsat surface UHIs for the whole province

## 2. Tools

- A vulnerability tool was developed within the SUPREME system
- All variables can be parameterized, proportion/number of people affected
- Shows census tracts in defined segment (e.g. top 10%)
- Allowed us to focus on very deprived areas in UHIs for all projects
- Used by project promoters and municipalities since (40 000 downloads)



# 3. Pilot projects: Open call for proposals



With specific criteria, based on previous orientations. Small and large, for 44 projects.

Matching required, and we got 2:1 matching in total (\$ and in-kind).

NGOs, municipalities, public housing authorities.

### 3. Pilot projects: Open call for proposals



Evaluated and followed by  
various specialists hired  
by our institute

Minimum score of 70% to  
get funded

Very popular

# Actual projects: greening



# Actual projects: extensive green roofs



# Actual projects: White roofs



# Backstreets can be improved



# Shade in public housing settings



# Parkings



# Parkings can be smaller



**Before**



**After**

# Public housing for people too



**Before**



**After**





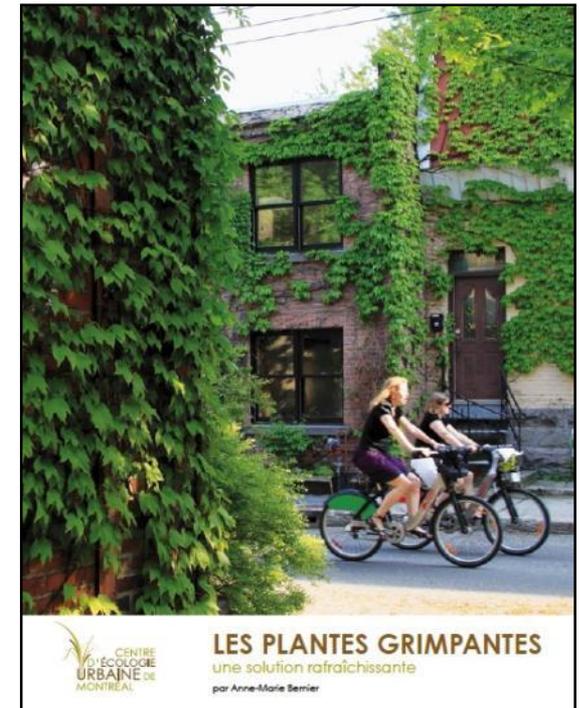
# Statistics: total value of 45 M\$

**44 projects in total**

|                       |  |
|-----------------------|--|
| 17 schoolyards        | 5 kindergardens                        |
| 7 backstreets         | 4 public housing                       |
| 2 white roofs         | 4 green roofs                          |
| 8 cool public squares | 11 urban agriculture                   |
| 10 parkings           | 1 borough: all raingutters to the soil |

## 4. Evaluation of projects

- All projects had a communication plan (local and neighbourhood)
- All had a maintenance plan
- All used participatory methods to design improvements collectively

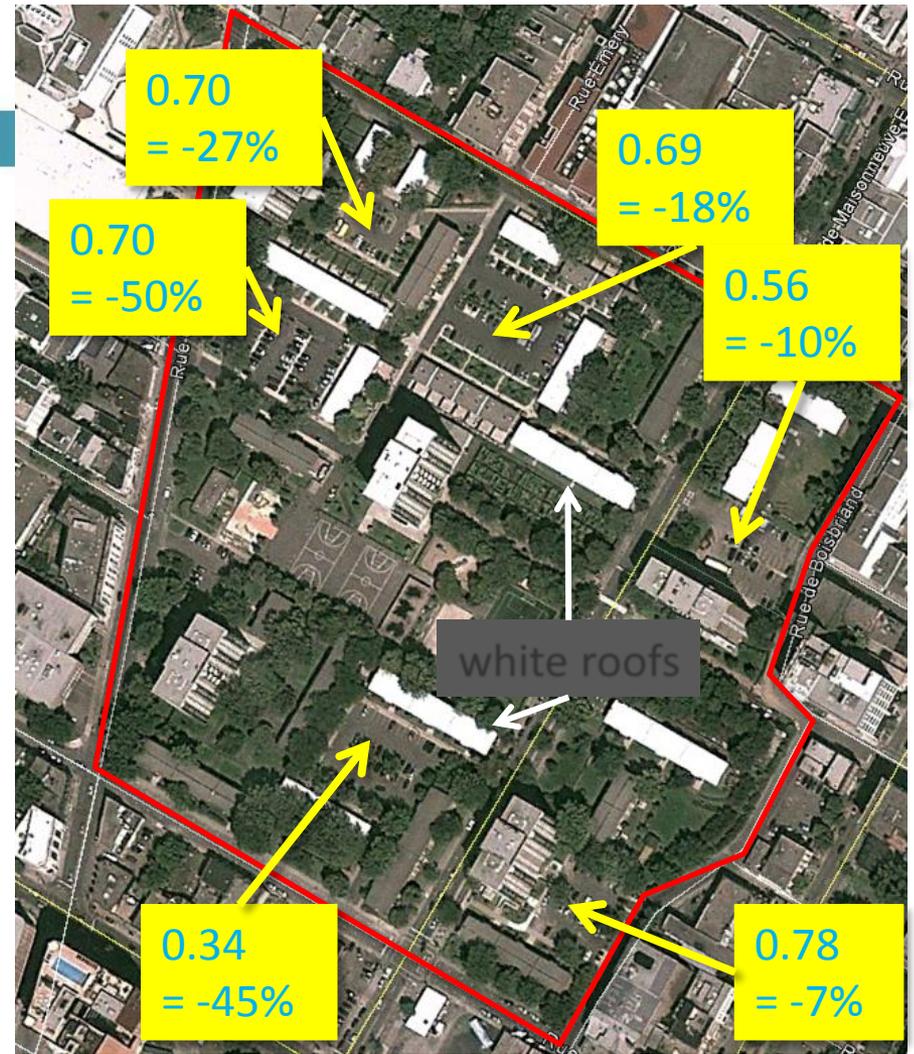
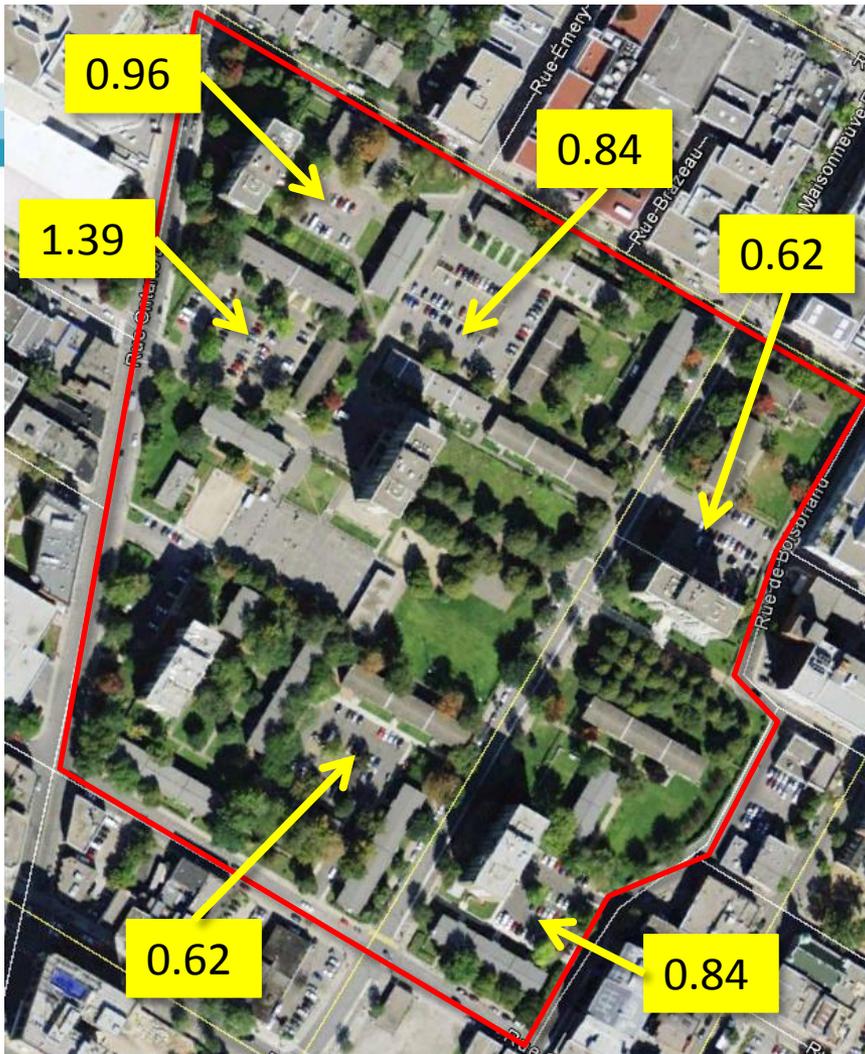


# 4. Evaluations

It can be very effective:

- Quality of life much improved (before/after surveys)
- More shade, nicer, quieter
- More social activities (urban agriculture, mini-parks) and more physical exercise
- Cooler too, but the devil is in the details (improvement anywhere between 0 and  $-3,7$  °C), according to an evaluation conducted by Environment Canada (using numerical modelling and satellite imaging and micrometeorology).

# Thermal improvement performance in %



Public Housing Jeanne-Mance in Montreal

# Side effects

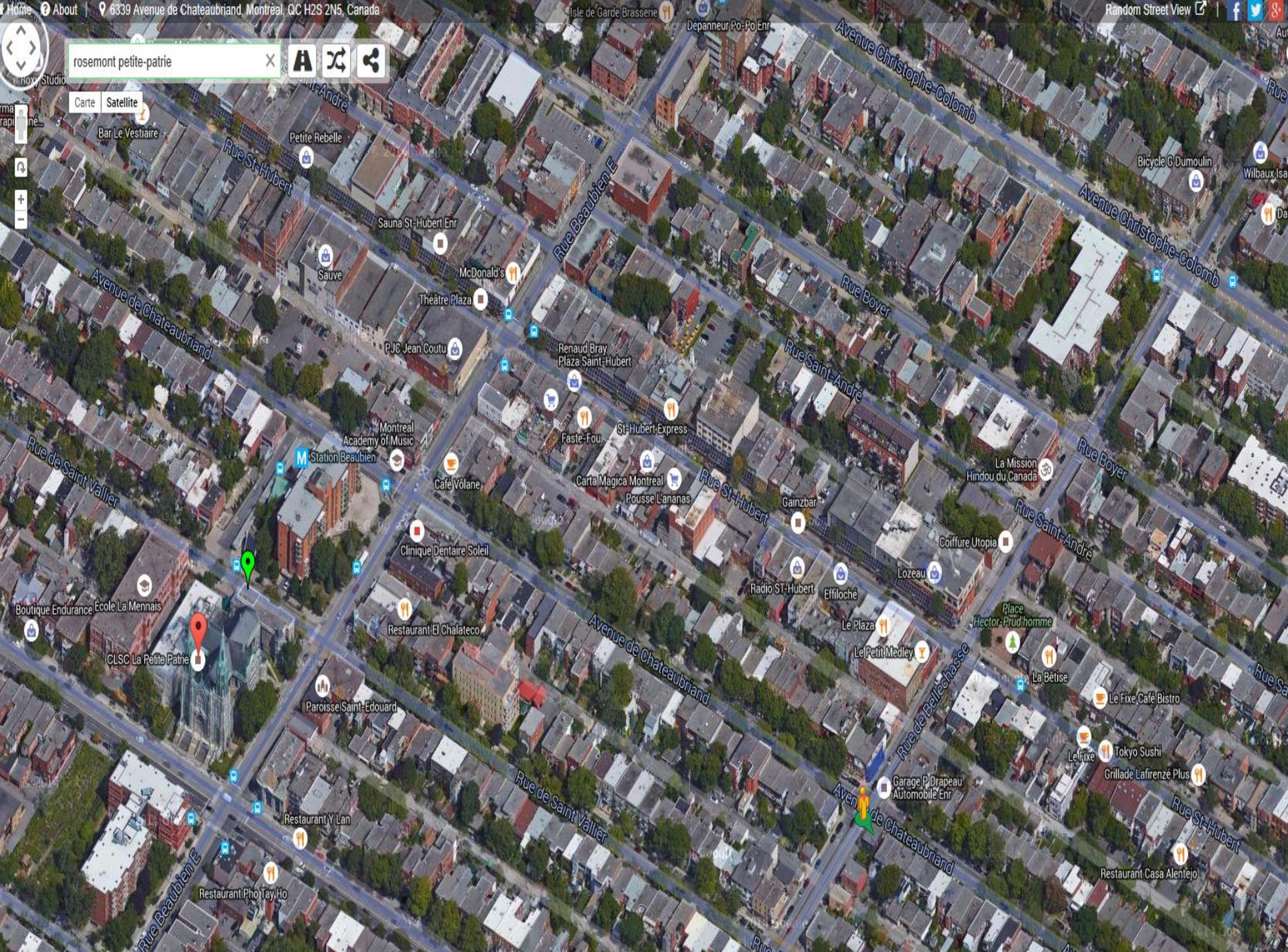
Municipalities offering grants for white roofs, more trees, more urban agriculture...





rosemont petite-patrie

Carte Satellite



- Bar Le Vestiaire
- Petite Rebelle
- Sauna St-Hubert Entr
- McDonald's
- Théâtre Plaza
- PJC Jean Coutu
- Renard Bray Plaza Saint-Hubert
- St-Hubert Express
- Faste-Fou
- Carta Magica Montreal
- Pousse L'Ananas
- Café Volane
- Clinique Dentaire Soleil
- Restaurant El Chalateco
- Paroisse Saint-Edouard
- Restaurant Pho Tay Ho
- Restaurant Y Lan
- Boutique Endurance
- École La Mennais
- CLSC La Petite Patrie
- Station Beaubien
- Montreal Academy of Music
- Gainzbar
- Radio St-Hubert
- Effiloche
- Lozeau
- Le Plaza
- Le Petit Medley
- Garage P Drapeau Automobile Entr
- La Mission Hindou du Canada
- Coiffure Utopia
- Place Hector-Prud'homme
- La Bêtiise
- Le Fixe Café Bistro
- Le Fixe
- Tokyo Sushi
- Grillade Lafrenze Plus
- Restaurant Casa Alentejo

# 5. Lessons learned



When you work in public health, managing infrastructure projects is not really your cup of tea...

Participation of local end-users is crucial and very rewarding

Size of projects matter for impact

Such projects can be immensely popular with people and politicians

# 5. Lessons learned

Continuous dissemination of concepts, impacts and solutions remains essential

Institut national de santé publique Québec

ACCUEIL À PROPOS CONTACT

Mon climat, ma santé

POUR MEILLEUR ADAPTER AUX CHANGEMENTS CLIMATIQUES

Découvrez le blogue Mon climat, ma santé

LES IMPACTS DES CHANGEMENTS CLIMATIQUES SUR LA SANTÉ

public expert

Actualités

Mon Climat Ma Santé

Parcourir les vidéos

Résultats de recherche correspondant à "lutte aux îlots de chaleur":

Journée de l'Arbre de la santé

Inondation du Richelieu : impacts...

Lutte aux îlots de chaleur urbains...

Lutte aux îlots de chaleur: Projet E...

Îlot de fraîcheur à Lasfère

[www.youtube.com/user/MonClimatMaSante](http://www.youtube.com/user/MonClimatMaSante)

[www.monclimatmasante.qc.ca/](http://www.monclimatmasante.qc.ca/)

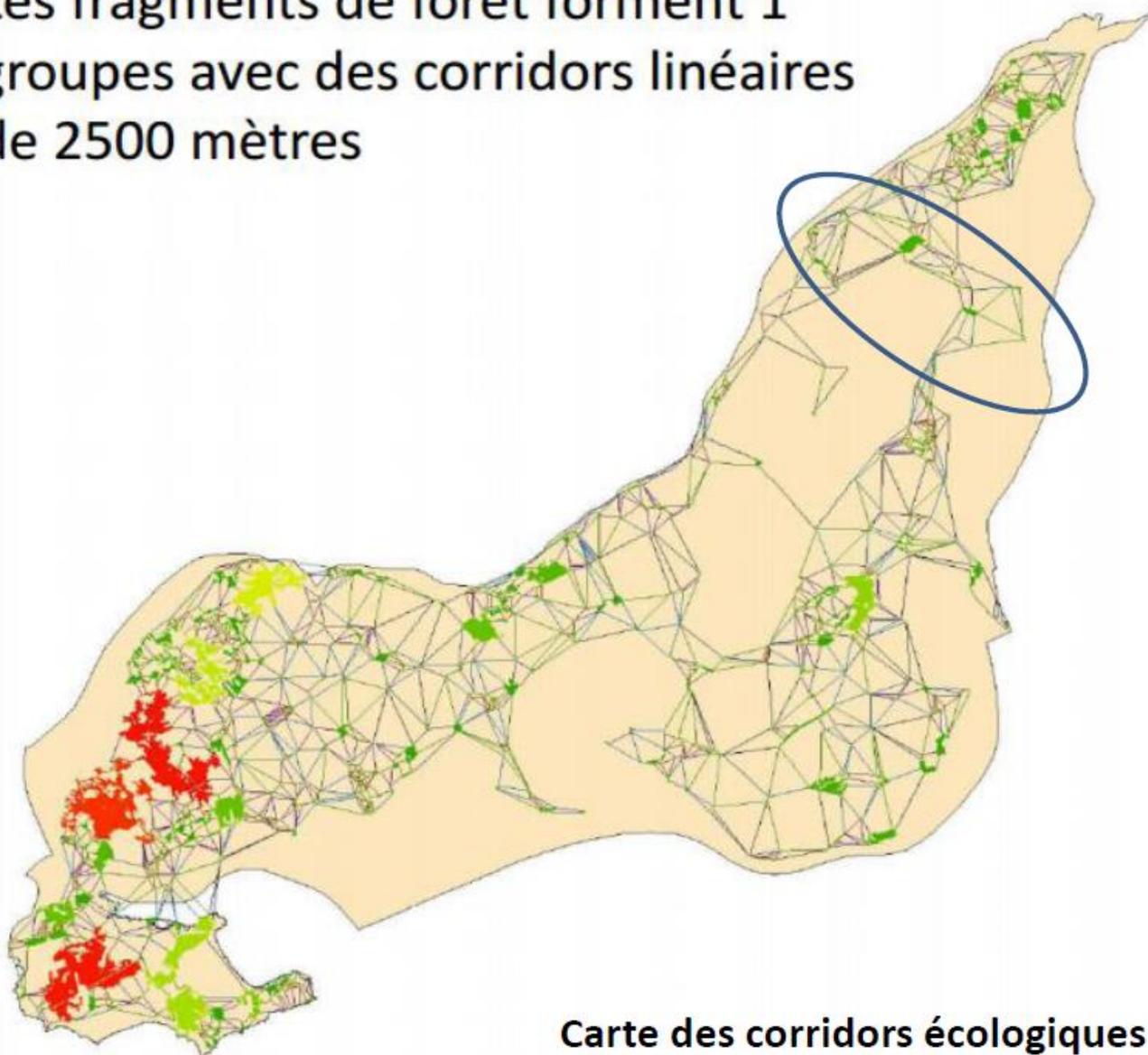
Institut national de santé publique Québec

# 6. Repeat and avoid mistakes

We now have only two projects this year (till 2020):

- Two coalitions of NGOs working with municipalities, private sector, hospitals, specialists and the public
- Large size and ambitious projects
- Now includes criteria in biodiversity, physical exercise, more urban agriculture, besides heat avoidance
- Connectivity, linear parks promoted, high media visibility
- Participatory (with online platform for commitments)
- Evaluation by universities on all aspects

Les fragments de forêt forment 1  
groupes avec des corridors linéaires  
de 2500 mètres



Carte des corridors écologiques  
Dr. Gonzalez

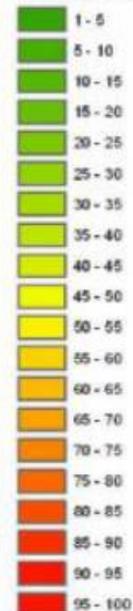
PATCH IMPORTANCE AT  
THRESHOLD OF 2500 METERS

Legend

LINK LENGTH (meters)



VALUE FOR PATCH IMPORTANCE



1 cm equals 2 km





# Merci!

[www.inspq.qc.ca](http://www.inspq.qc.ca)