CORDEX stakeholder meeting

BRUSSELS REGION

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How does the Brussels region deal with urban water management & climate change?

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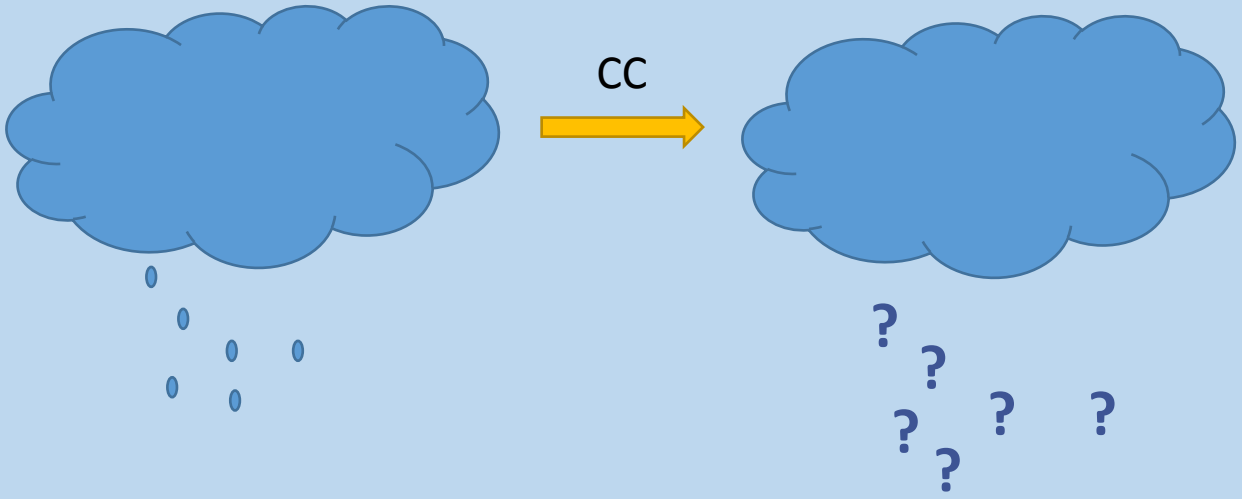
Foreword



« A preliminary study (...) in the Brussels Region in the context of climate change (...) highlighted .....

... the strengths and limitations of the modeling,

and thus makes it possible to lay down the methodology to be considered in a possible future study »

Foreword

But then ... have we considered climate change in WMP2016-2021???

In a quantitative way: NO

In a qualitative way: YES, as arguments for certain measures, which in reality are necessary for more immediate causes:

- Urbanization!
- Aging / silting / inadequate infrastructure
- Our relation to risk

Climate change➔ Global change

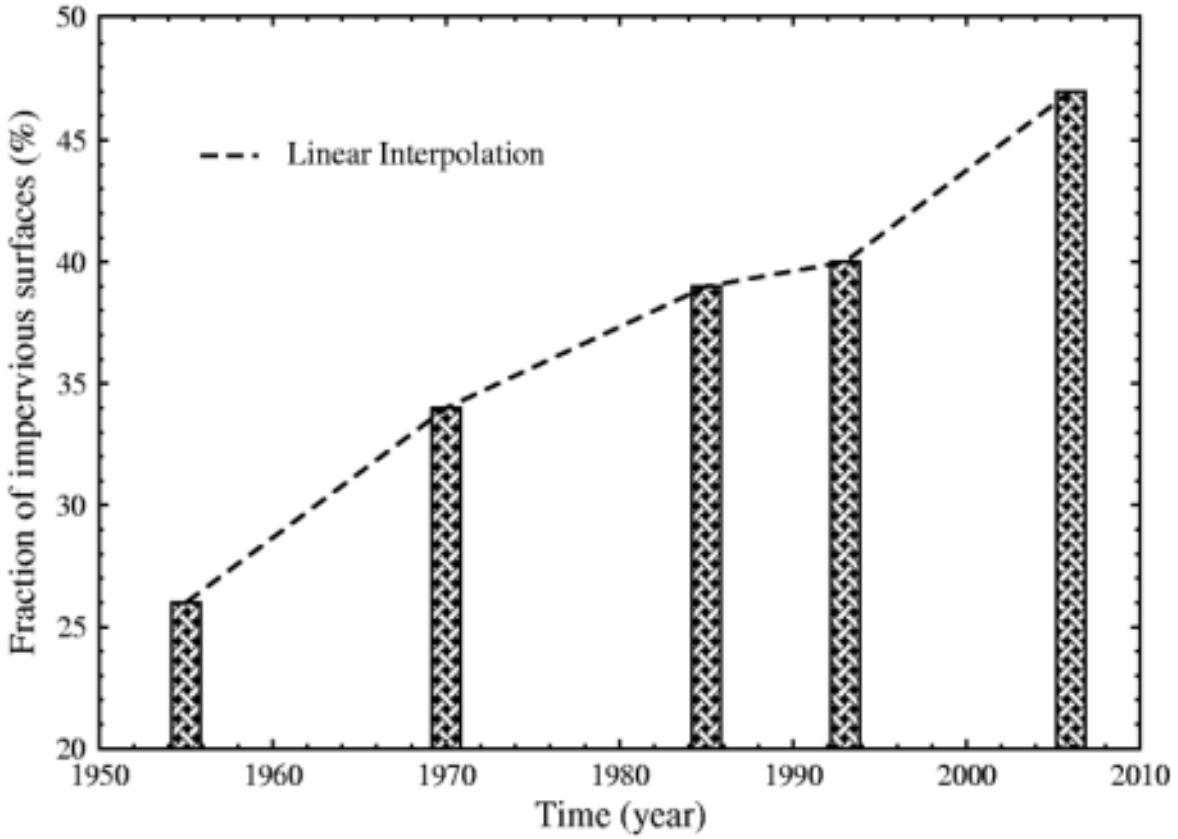


Fig 2. Evolution of the average percent imperviousness of the Brussels Capital Region from 1955 to 2006.

Main change

Surface sealing

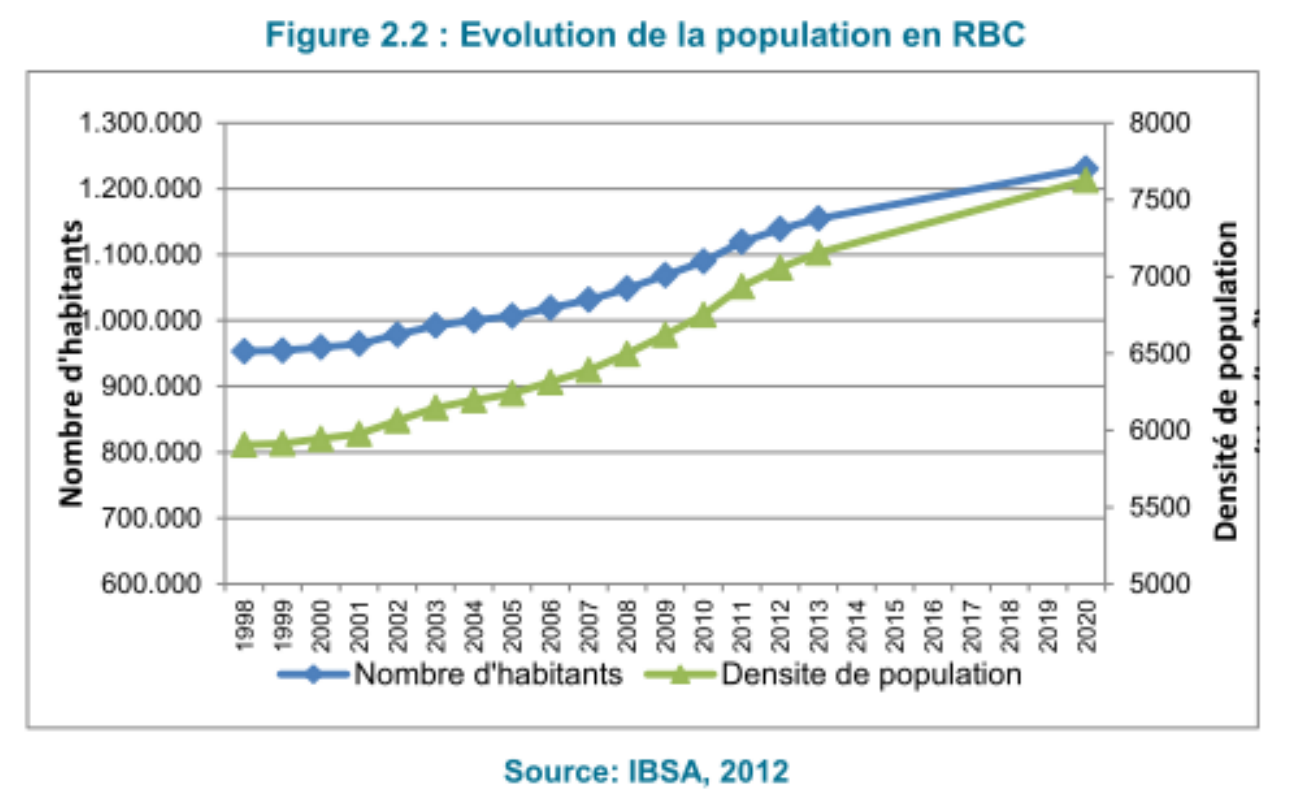
26% ➔ 47% !

1955: R = P x RC x S

2006: R = **P** x **RC** x S

But the sewers did not grow !

Climate change➔ Global change



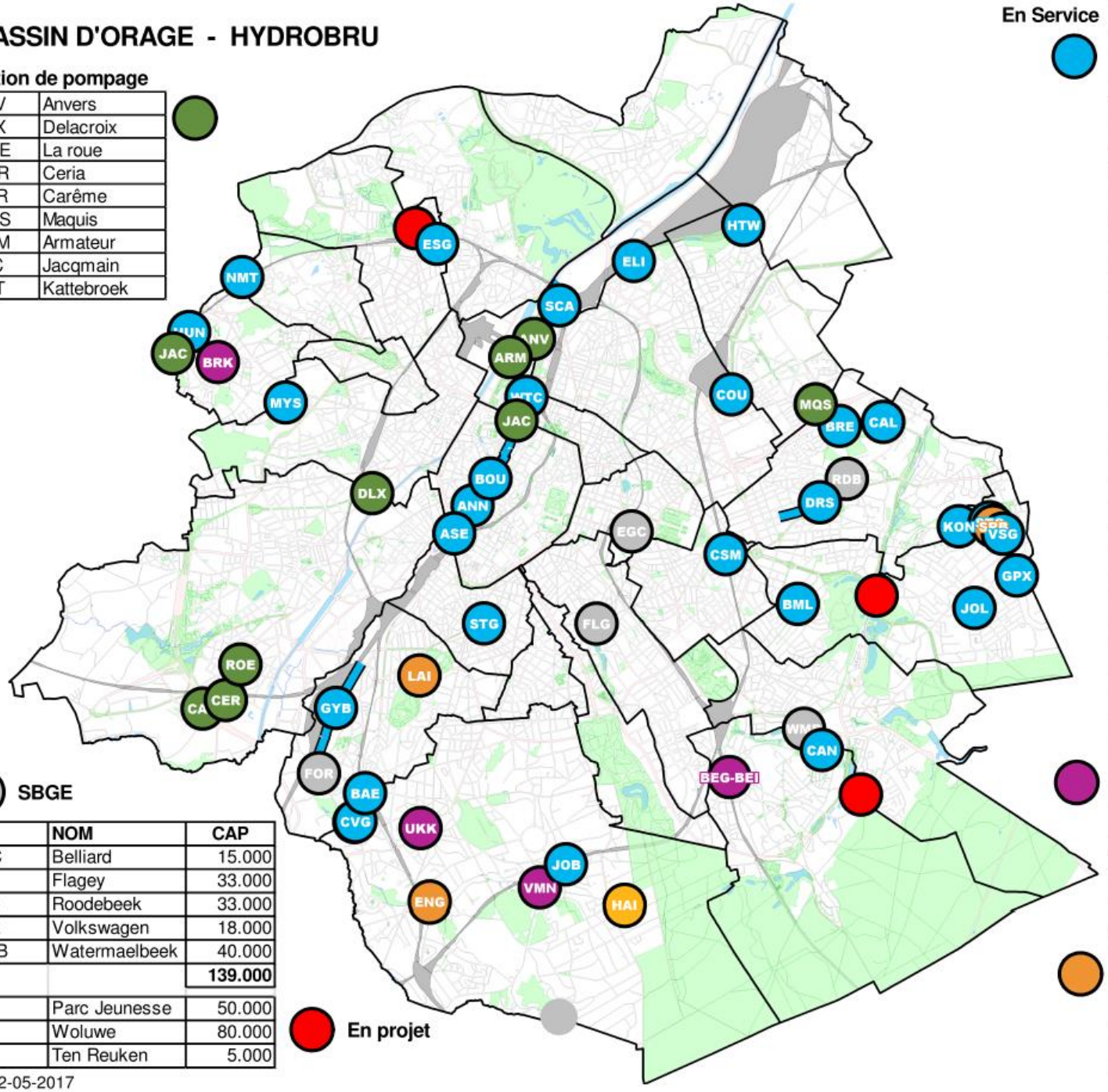
The grow continues!

➔ More waterproofing

➔ More water consumers!

➔ More wastewater producers!

BASSIN D'ORAGE - HYDROBRU



Station de pompage

ANV	Anvers
DLX	Delacroix
ROE	La roue
CER	Ceria
CAR	Carême
MQS	Maquis
ARM	Armateur
JAC	Jacqmain
KAT	Kattebroek

SBGE

REF	NOM	CAP
EGC	Belliard	15.000
FLG	Flagey	33.000
RDB	Roodebeek	33.000
FOR	Volkswagen	18.000
WMB	Watermaelbeek	40.000
		139.000

	Parc Jeunesse	50.000
	Woluwe	80.000
	Ten Reuken	5.000

En projet

ver.02-05-2017

En Service

REF	NOM	CAP
ANN	Anneessens	11.000
BAE	Baeck - Merrill	1.000
BML	Bemel	5.200
BOU	Bourse	15.000
BRE	Bretagne	600
CAL	Calabre	300
CAN	Cannas	70
COU	Courtens	6.000
CSM	Cours St-Michel	3.500
CVG	Clos de la Vigne	40
ELI	Princesse Elisabeth	300
ESG	Foyer Jettois	1.000
GPX	Grand-Prix	7.000
HTW	Houtweg	30.000
HUN	Hunderenveld	8.000
JOB	Saint-Job	4.550
KON	Konkel	140
MYS	Myrtes	3.700
NMT	Nestor Martin (Technologi	10.000
SCP	Schiphol	100
STG	Morichar	5.000
STO	Stockel	2.500
VSG	Val des Seigneurs	7.500
WTC	WTC	7.500
		130.000
SCA	SCAB	4.000
ASE	Ancien Pertuis Senne	43.825
DRS	Foncage Dries	2.300
GYB	Geleytsbeek	2.400
		182.525

En Execution

REF	NOM	CAP
BEG	Begonias	4.000
BEI	Bien Faire	4.000
BRK	Grand-Bigard - Broek	2.000
VMO	Vieille rue au Moulin	4.000
UKK	Ukkelbeek (Fonçage)	25.000
		39.000

En Projet

REF	NOM	CAP
ENG	Engeland/Bourdon	2.000
SRB	Square Roi Baudouin	8.000
LAI	Lainé	5.000
HAI	Collecteur Hain	2.000
		17.000

➔ Public storage

500 000 m3 for a Region of 160 km2 = 3 mm

Application of the actual Urban planning laws

- **permeable Surf over 50% of the courtyard and garden surface**
- **Green Roof on more than 100m² of flat roofs**
- **33l / m² roof of rainwater cistern**

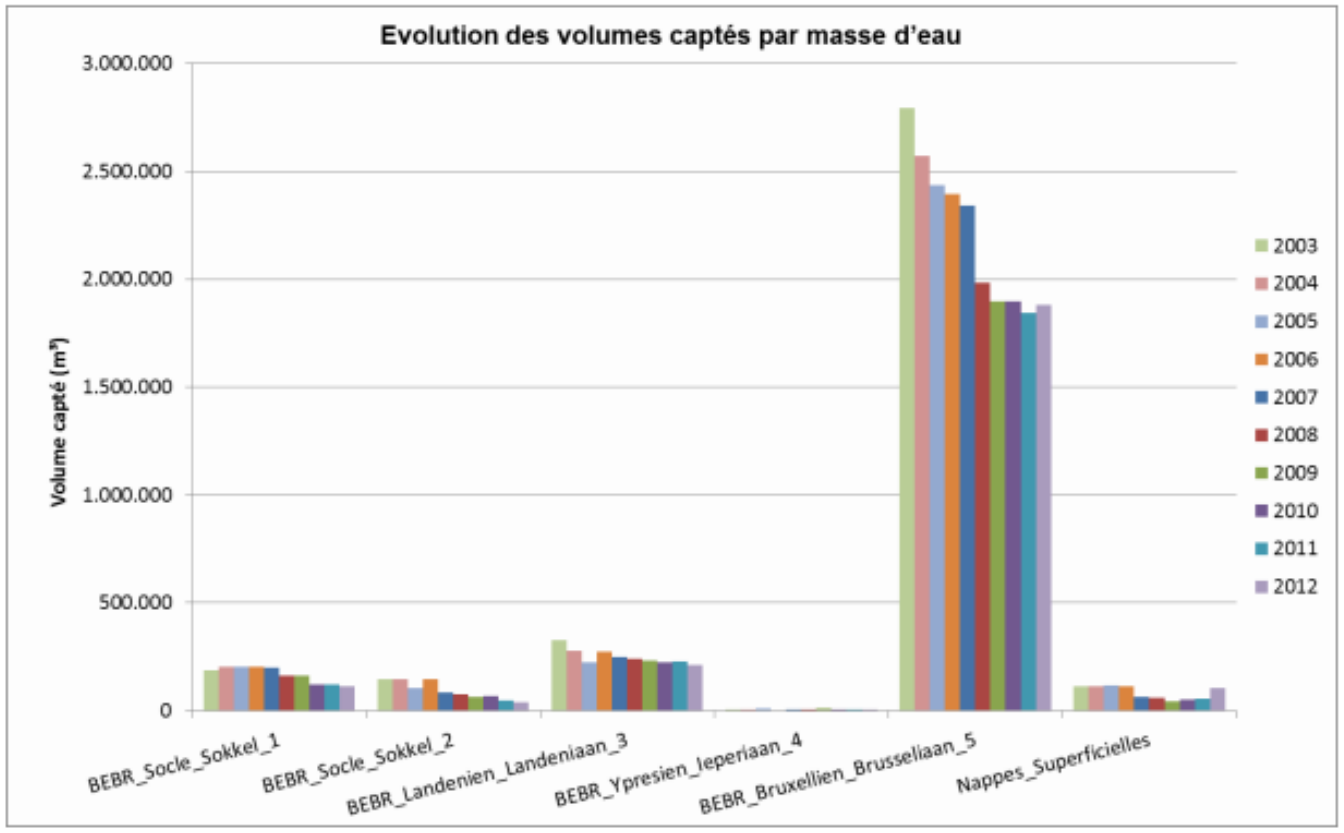
Where applicable, application of an Environmental Licence

- **Separate networks up to plot boundary (street side)**
- **if possible, discharges to surface water or infiltration, with quality management**
- **Stormtank of 25l / m² of all waterproof surf. (and max flow of 5 l / s / ha)**

➔ Private storage

Climate change➔ Global change

Figure 2.37 : Evolution des volumes captés par masse d'eau sur la période 2003 - 2012



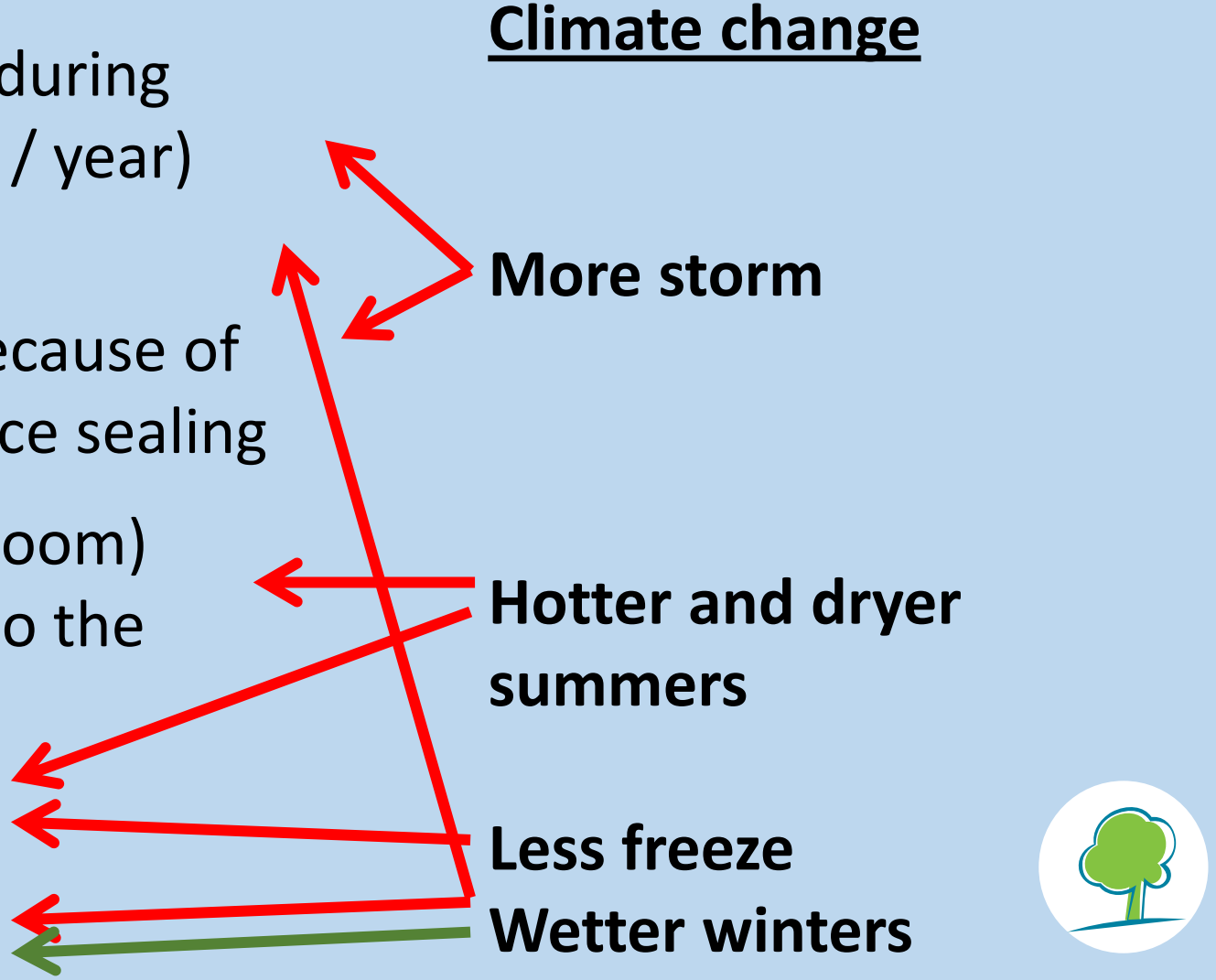
Source : Bruxelles Environnement, 2013.

But deindustrialization

➔Less pumping
➔the groundwater goes up!
➔Historical Industrial Pollution
➔Micro-pollutants of the current world

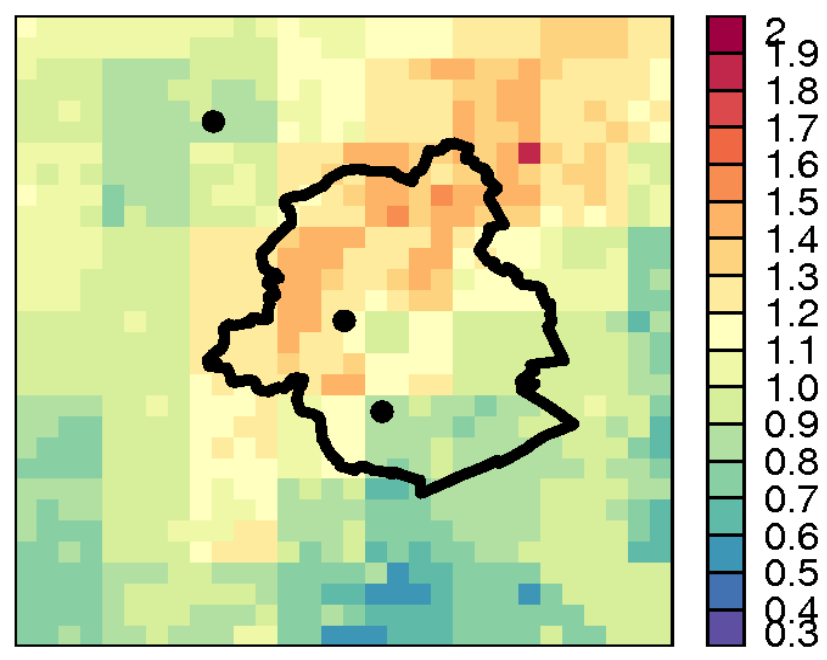
Current Issues

1) Water quality: high sewage impact during rainfall, frequent CSO events (> 70x / year) with high discharge (peak flow!).
2) Flood: High sensitivity to storms, because of the steep topography and the surface sealing
3) Ecological problem in dry period (bloom) because a lot of fresh water is lost to the sewer, lack of renewal of the water.
4) Invasive Species (plants)
5) Rise of the groundwater



Future Issues

Urban heat islands!



Climate change

More storm

Hotter and dryer summers

Less freeze
Wetter winters

Our philosophy: an evaporating city

1) Blue Network: an open-air water network rich in interconnected wetlands and ponds
2) Rain Network: an open-air separate network, with valorized landscape
3) Green Network: reinforce the vegetation of the city globally (green roofs, planted swales, rain-harvesting trees, natural riverbanks, …)

➔ **Multi-objective (living environment, support of biodiversity, soft mobility axis, storage area, self-purification, calmness …)**

Infiltrer – Evaporer – Evapotranspirer – Retarder

Technical measure

1) Revision of the design rainfall: RP 10 years ➔ RP 20
2) Clarification of mandatory damping : 25 l / m2 of contributive surface
3) Reduction of the allowed outflow discharge: 10 l/s/ha ➔ 5 l/s/ha
4) "INCA-IDF" flood warning system + hydraulic forecasting system (launched for rivers, to be initiated for sewers)
5) Awareness-raising actions (a flood brochure, website , specific meeting)
6) Waterproofing tax?

A need of knowledge

Impact of CC on QDF values, for little timestep ➔ thunderstorms of the future

Means against invasive species

Acceptability of the risk, cost effectiveness concept

Rappelons ici comment sont définis pour l'IRM les degrés d'anormalité d'un cumul pluviométrique, en fonction de sa période moyenne de retour :

Code	Degré d'anormalité (en excès ou déficit) :	cumul égalé ou dépassé en moyenne une fois tous les
n	Normal	-
a	Anormal	6 ans
ta	Très anormal	10 ans
e	Exceptionnel	30 ans
te	très exceptionnel	100 ans