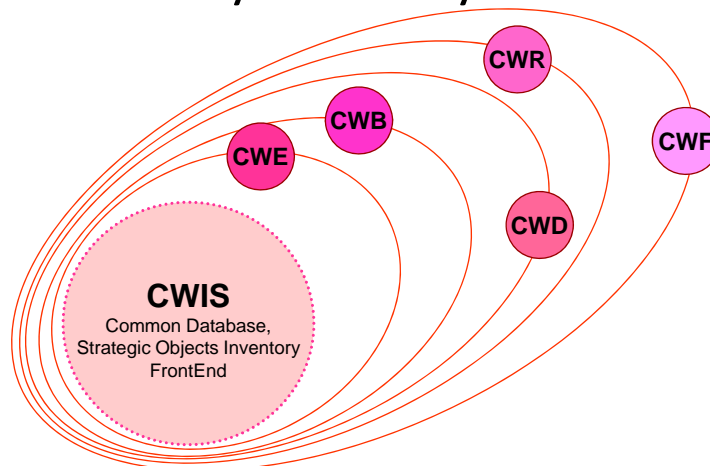


# City Water: an information sharing platform to support LAs in exploring new strategies.

Marc Soutter, Colin Schenk, Bastien Roquier  
EPFL, Lausanne



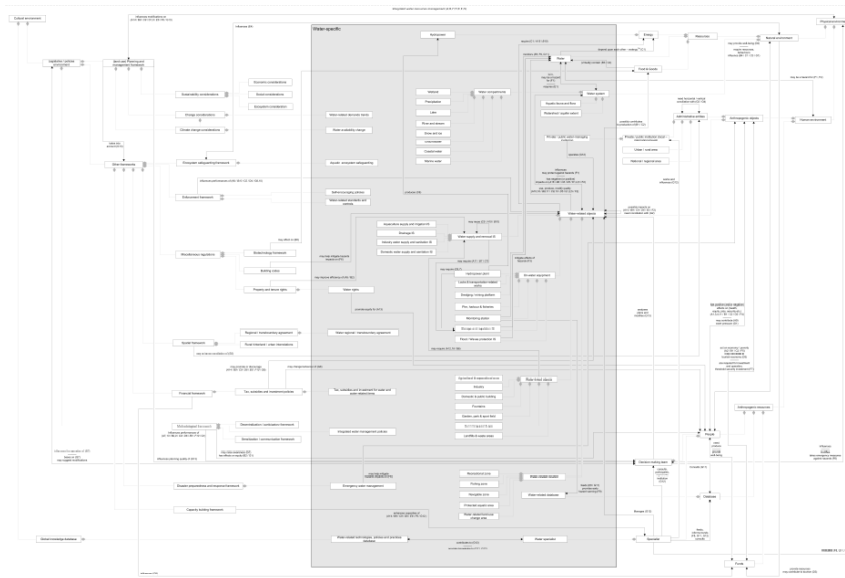
## The City Water System



**D.1.4-1 R & D.1.4-2 R****The water dimension of urban and land planning :  
review of the relevant water system components  
and issues, state of the art and promising  
research directions  
towards a more water aware planning process**

[http://switchurbanwater.lboro.ac.uk/outputs/pdfs/WP1-4\\_DEL\\_Water\\_dimension\\_of\\_urban\\_and\\_land\\_planning.pdf](http://switchurbanwater.lboro.ac.uk/outputs/pdfs/WP1-4_DEL_Water_dimension_of_urban_and_land_planning.pdf)

Annex 1. Water management system model



## Common database: dimensions

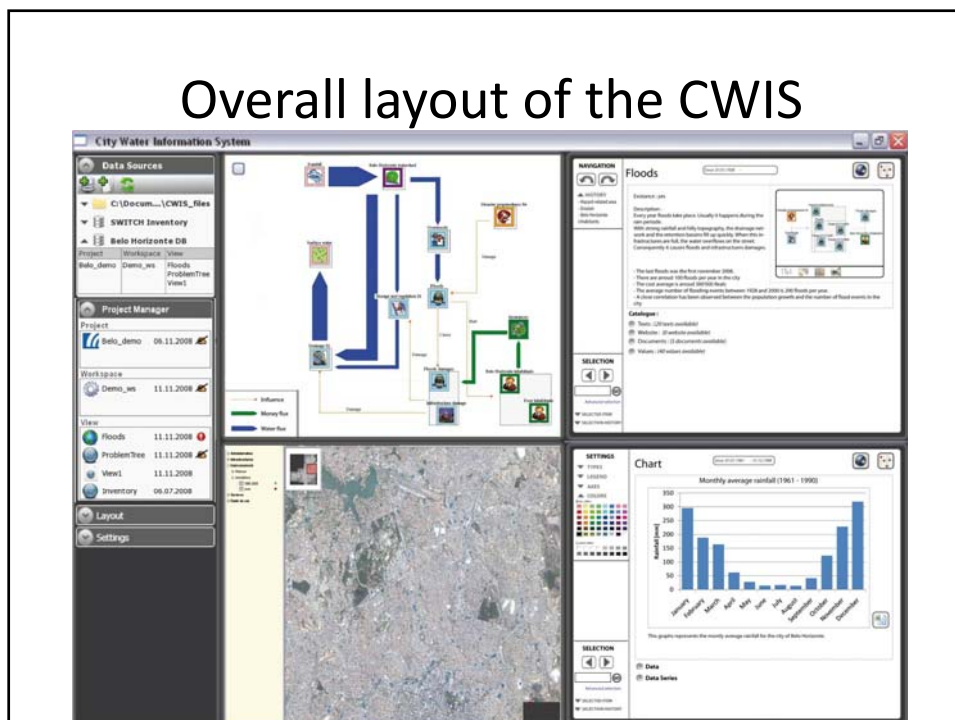
- Time
- Space
- Scenarios, strategies, stories
- Values, references, series, imprecision
- Existence: Real, virtual, inventory, model
- Metainformation
- Localisation: languages, units
- Archives
- Edition and validation

## Outline

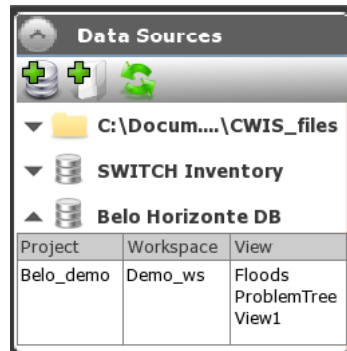
1. CWIS frontend
2. Inventory and models
3. Using City Water
4. Conclusion and outlooks

## PART 1 : CWIS APPLICATION

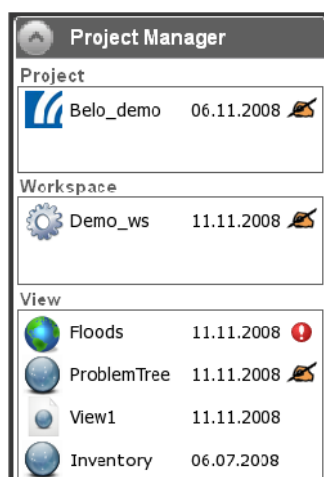
### Overall layout of the CWIS



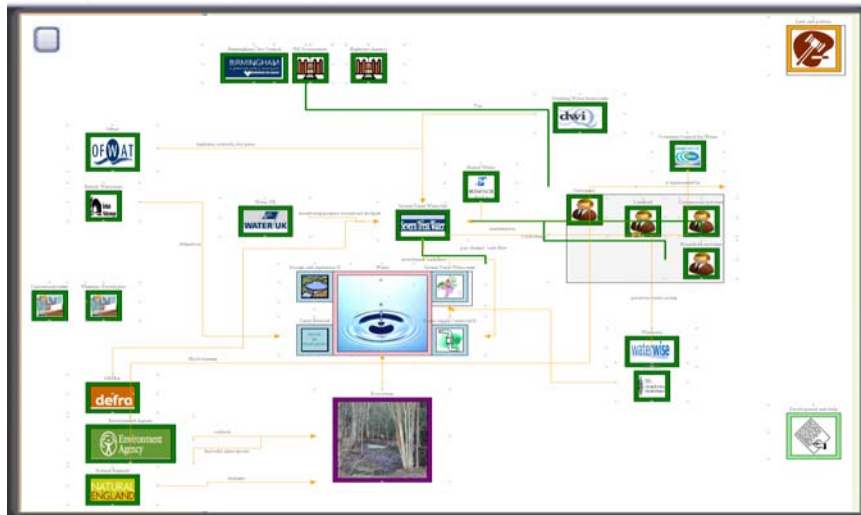
## Gen Purpose Tools – Data sources



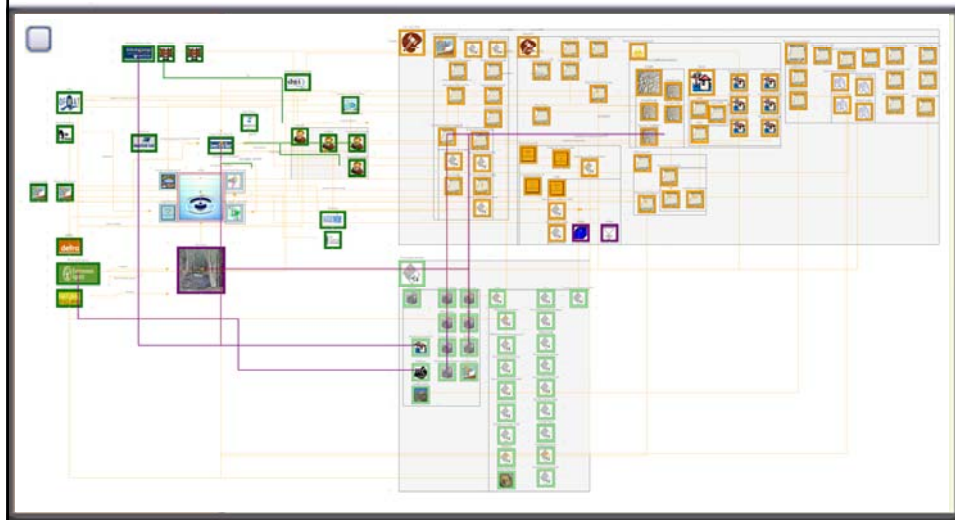
## Gen Purpose Tools – Project manager



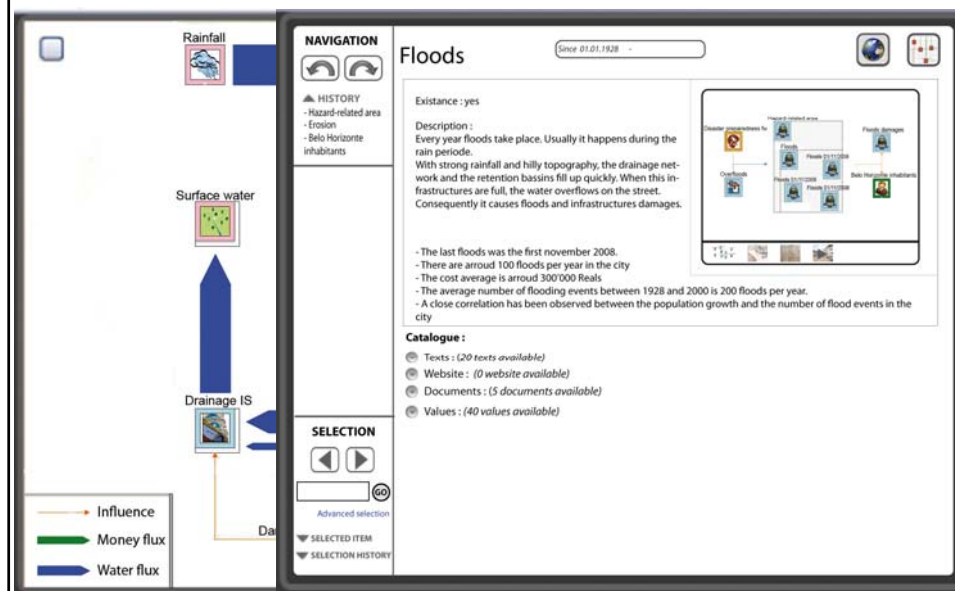
## Viewers – System viewer : Thematic views



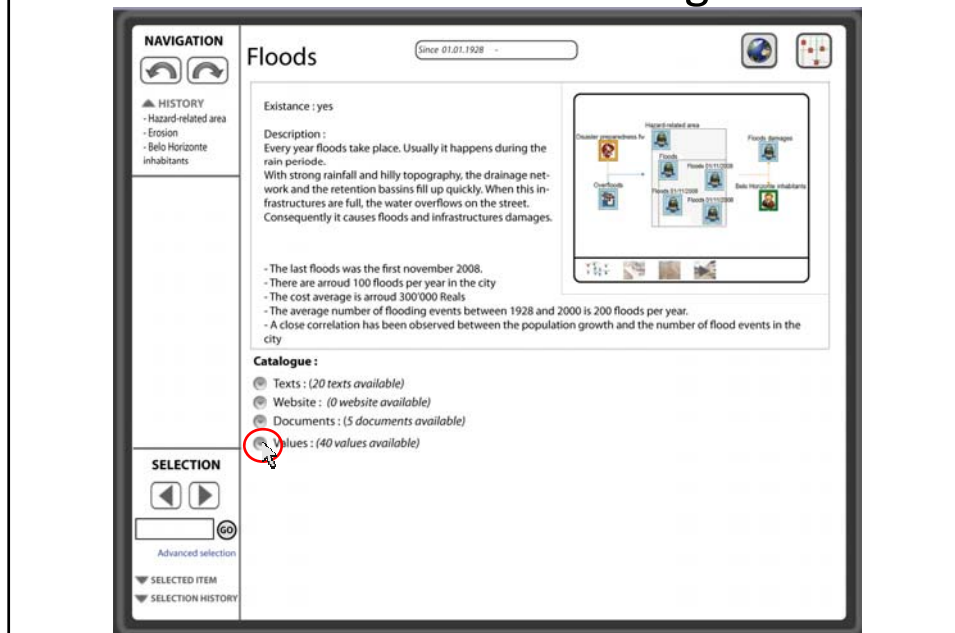
## Viewers – System viewer : Thematic views showing more details



## Viewers – Consulting information



## Viewers – Data manager



## Viewers – Data manager

**NAVIGATION**

**HISTORY**

- Hazard-related area
- Erosion
- Belo Horizonte inhabitants

**SELECTION**

Advanced selection

SELECTED ITEM

SELECTION HISTORY

**Floods**

Existence : yes

Description :  
Every year floods take place in the city of Belo Horizonte. With strong rainfall and work and the retention structures are full, the water overflows. Consequently it causes damage.

- The last floods was the one in 2008.  
- There are around 1000 people affected.  
- The cost average is around 1000 million.  
- The average number of floods is around 10 per year.  
- A close correlation has been found between the number of floods and the number of inhabitants.

**Catalogue:**

- Texts : (20 texts available)
- Website : (0 website available)
- Documents : (5 documents available)
- Values : (40 values available)

Units	Indicators	Information start	Information end
RS	Average flood damage cost	1928	2000
unit	Number of flooding events	1928	2000
unit	Number of flooding events : January	1928	2000
unit	Number of flooding events : February	1928	2000
unit	Number of flooding events : March	1928	2000
unit	Number of flooding events : April	1928	2000

Input Values : (20 values available)  
Output Values : (10 values available)

## Viewers – Data manager

**NAVIGATION**

**HISTORY**

- Floods
- Hazard-related area
- Erosion
- Belo Horizonte inhabitants

**SELECTION**

Advanced selection

SELECTED ITEM

SELECTION HISTORY

**Floods 01/11/2008**

Since 31.10.2008 - 01.11.2008

Strong rainfall during the night caused overflows in the city of Belo Horizonte and his metropolitian area.

In accordance with the Firemen, 38 occurrences had been. 33 calls of flooding was reported. The fireman help four collapses and rescue a man who was on the roof of his car.

In the Pampulha region, Sarandi river overflows.

In the Pampulha region, Sarandi river overflows.

Some stores had been flooded and the traders had placed the merchandises in the street.

In a house, the water reached two meters.

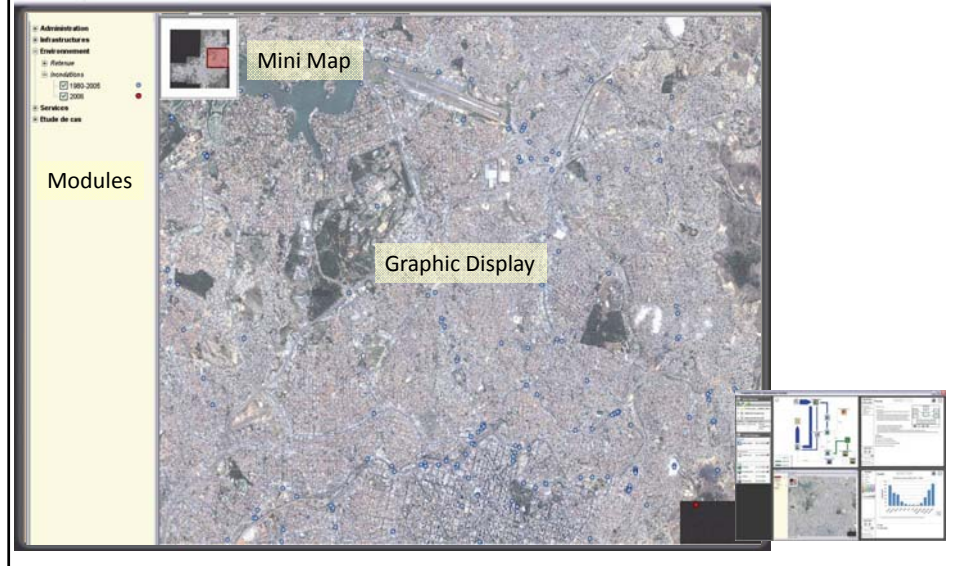
The cities of the metropolitan region are without electric energy in some points. According to Energy Company of Minas Gerais (Cemig), Betim, Contagem e Ribeirão das Neves, beyond Belo Horizonte, have five a thousand consumers without light.

**Catalogue:**

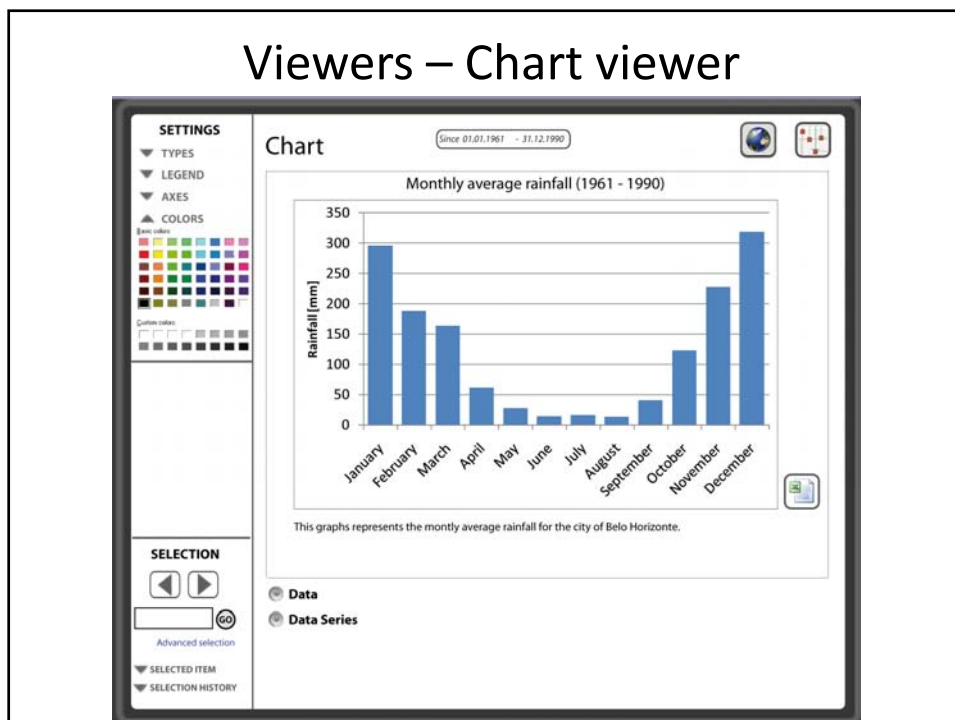
- Texts : (3 texts available)
- Website : (1 link available)
- Documents : (2 documents available)
- Values : (40 values available)

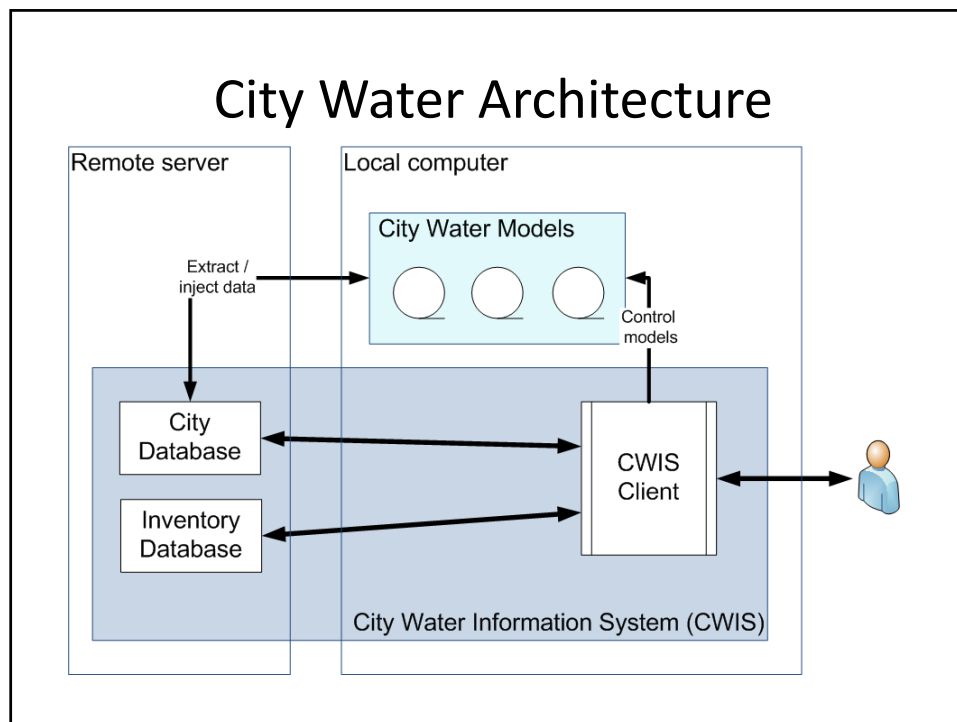


## Viewers – GIS viewer



## Viewers – Chart viewer





## PART 2 : INVENTORY AND MODELS



## Inventory

A collection of strategy objects: BMPs and other practices of reference

- Share knowledge and Best Management Practices (BMPs)
- Hand over results/innovations issued by SWITCH research groups
- Gather feedbacks on inventory objects
- Provide solutions to feed strategy definition and evaluation



## Inventory – Content

- **Structural BMPs:** physical measures such as wet ponds, vegetated roofs, river restorations...
- **Research developments:** studies, models, databases, software...
- **Policies:** i.e. IWRM policies, participation methods, trainings...
- **Stakeholders organizations:** LAs, stakeholders platform...
- **Strategic activities:** an integration of several strategic elements (for instance the implementation of a structural BMP with a scheme for financing and maintenance).

## Inventory sheet (example)

**NAVIGATION**

**Retention basin (wet pond)**

**Wet Ponds**

Minimum Measure: Post-Construction Stormwater Management in New Development and Redevelopment

Subcategory: Retention/Detention

**Photo Description:** The primary functions of a wet pond are to detain stormwater and facilitate pollutant removal through settling and biological uptake. The primary functions of a wet pond are to detain stormwater and facilitate pollutant removal through settling and biological uptake.

**Description**

Wet ponds (a.k.a. stormwater ponds, wet retention ponds, wet extended detention ponds) are constructed basins that have a permanent pool of water throughout the year (or at least throughout the wet season). Ponds treat incoming stormwater runoff by allowing particles to settle and algae to take up nutrients. The primary removal mechanism is settling as stormwater runoff resides in this pool, and pollutant uptake, particularly of nutrients, also occurs through biological activity in the pond. Traditionally, wet ponds have been widely used as stormwater best management practices.

**Applicability**

Wet ponds are widely applicable stormwater management practices. Although they have limited applicability in highly urbanized settings and in arid climates, they have few other restrictions.

**Typical removal rates:**

- Total Suspended Solids: 67%
- Total Phosphorous: 48%
- Total Nitrogen: 31%
- Nitrate Nitrogen: 24%
- Metals: 25%
- Bacteria: 65%

[http://tftp.epa.gov/npdes/stormwater/menuofbmps/index.cfm?action=factsheet\\_results&view=specific&bmp=68](http://tftp.epa.gov/npdes/stormwater/menuofbmps/index.cfm?action=factsheet_results&view=specific&bmp=68)

**SELECTION**

Advanced selection

SELECTED ITEM

SELECTION HISTORY

Reference: EPA Stormwater BMPs, <http://www.epa.gov/npdes/stormwater/menuofbmps>

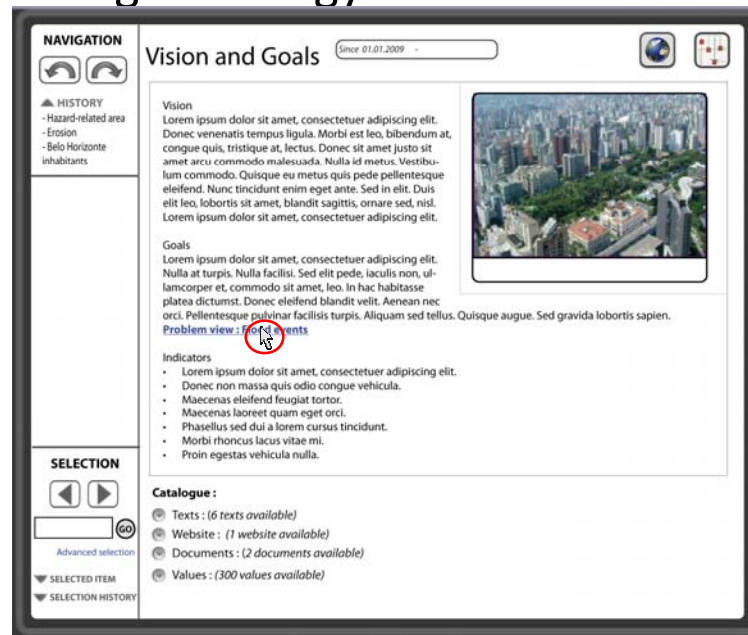
## Models

- CW Balance
- CW Drain
- CW Economics
- CW Risks
- ...

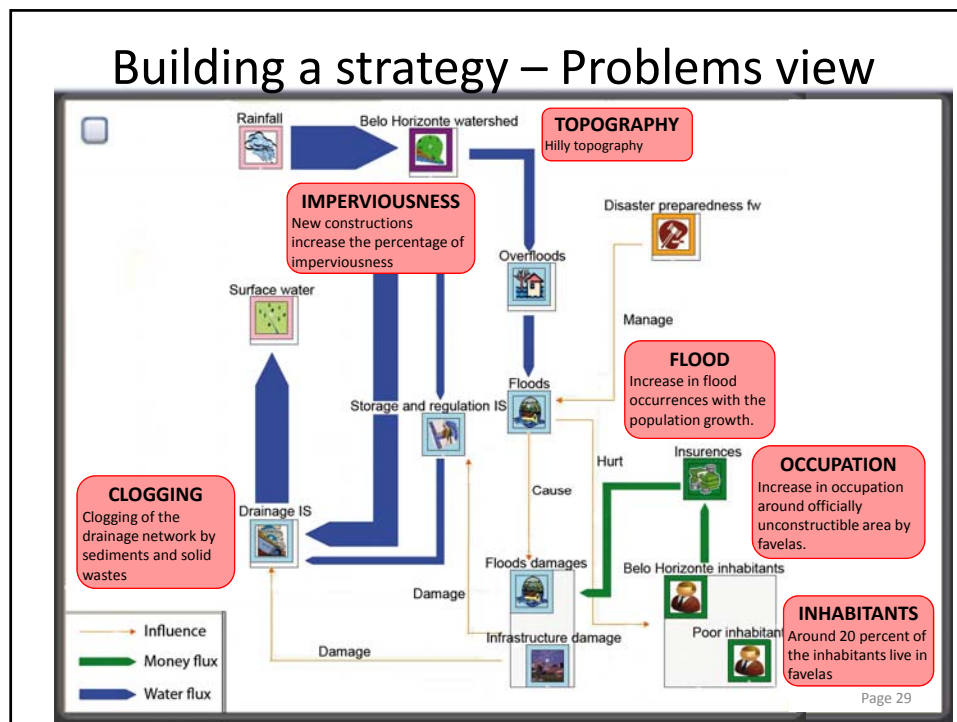
## **PART 3 : USING CWIS**

- What are the City's vision and goals?

## Building a strategy – Vision and Goals



- What are the problems?



- What practices may help?

## Building a strategy – Search data

**SELECTION**

◀ ▶

Inventory flood control **GO**

Advanced selection

▼ SELECTED ITEM

▼ SELECTION HISTORY

Page 31

## Building a strategy – Selection results

**NAVIGATION**

◀ ▶

▼ HISTORY

**SELECTION**

◀ ▶

Advanced selection

▼ SELECTED ITEM

▼ SELECTION HISTORY

**Selection results**  
Results found for: ALL (Inventory flood control)

▲ **Inventory**

- ▼ Dam - 10 results
- ▲ Retention basin - 3 results  
A retention basin, is a type of best management practice (BMP) that is used to manage stormwater runoff to prevent flooding and downstream erosion.
- ▼ Retention basin (wet pond) - 3 results
- ▼ Detention basin (dry pond) - 3 results
- ▼ Infiltration basin - 2 results
- ▼ Dyke - 4 results
- ▼ Drainage infrastructure - 1 result
- ▼ Monitoring Station - 0 result
- ▼ Emergency water management - 2 results
- ▼ Integrated water management policies - 4 results
- ▼ Self encouraging policies - 4 results
- ▼ Tax subsidies and investment for water - 2 results
- ▼ Study - 5 results
- ▼ Software - 9 results

▼ **Belo Horizonte**

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## Building a strategy – Inventory view

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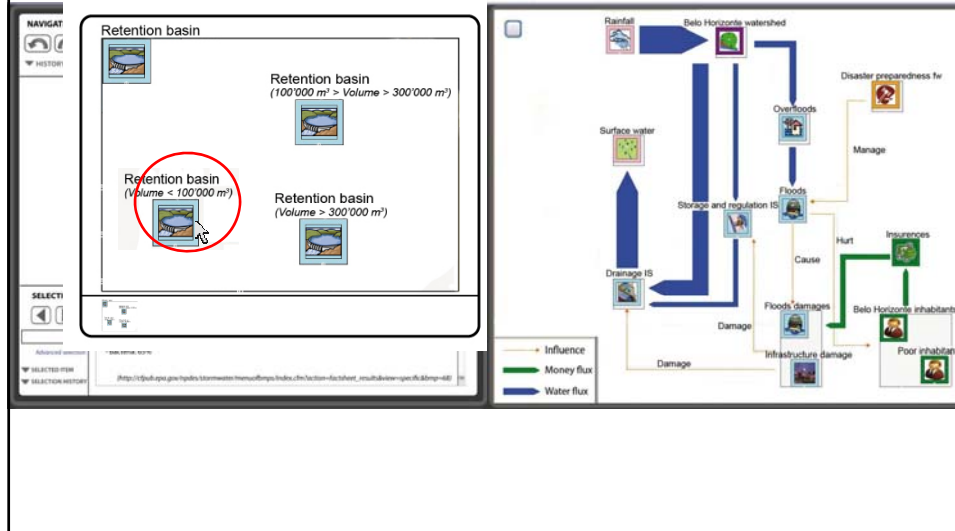
([http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm?action=factsheet\\_results&view=specific&bmp=68](http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm?action=factsheet_results&view=specific&bmp=68))

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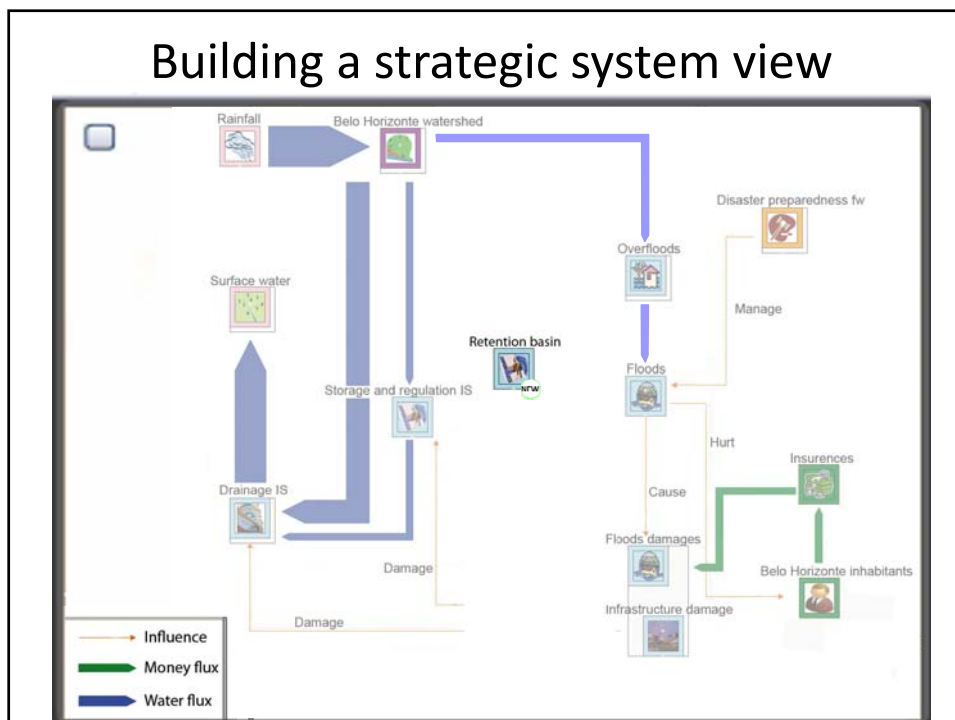
Reference: EPA Stormwater BMPs, <http://www.epa.gov/npdes/stormwater/menuofbmps>

- How to apply a strategy?

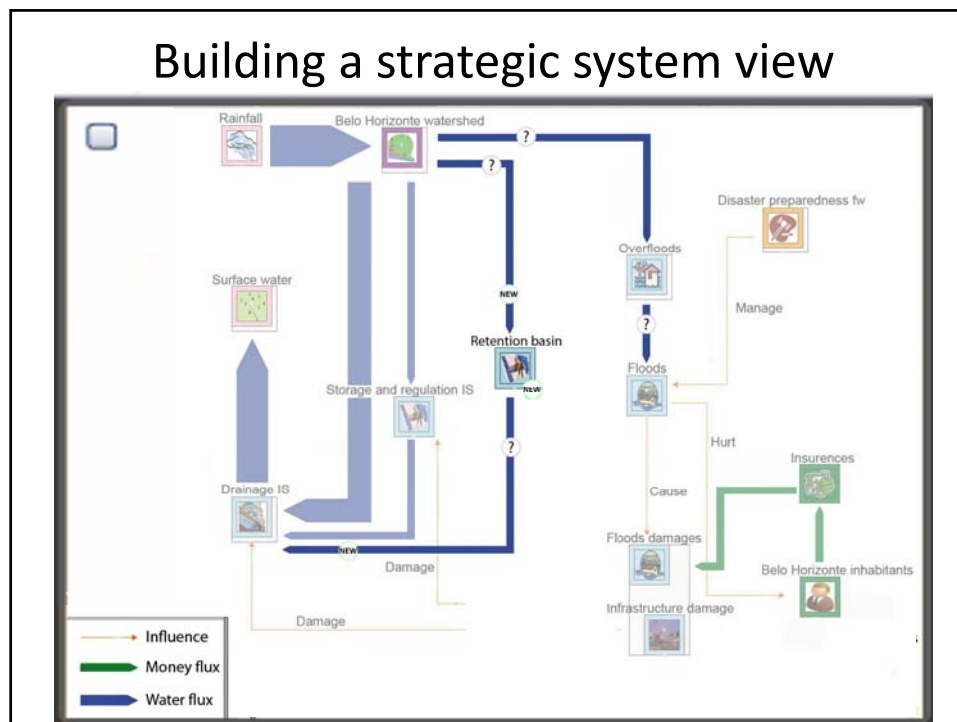
## Building a strategic system view



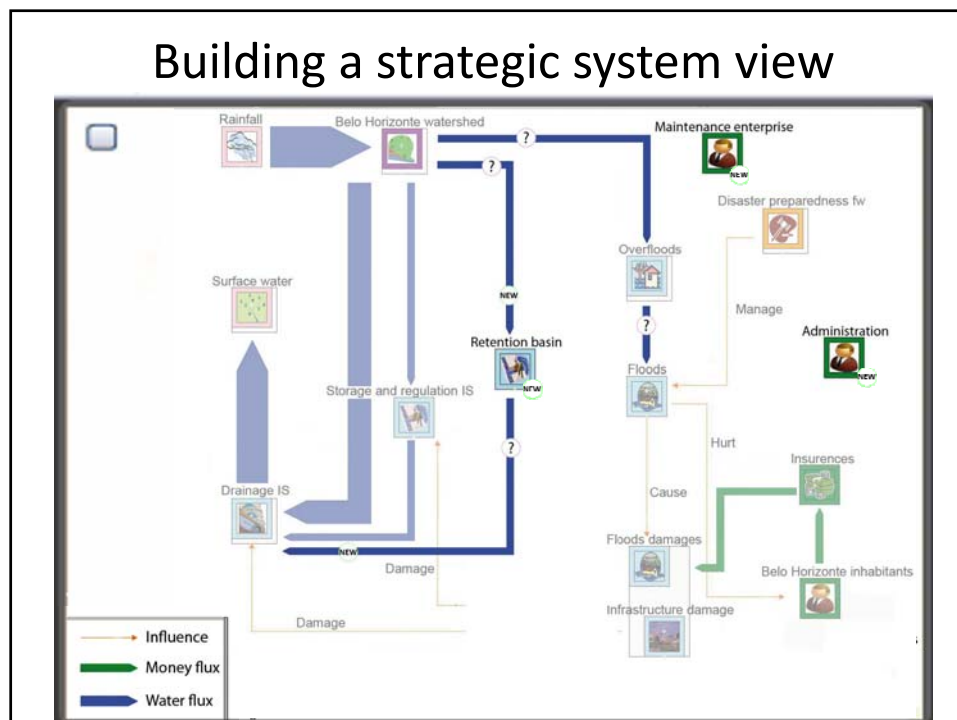
## Building a strategic system view



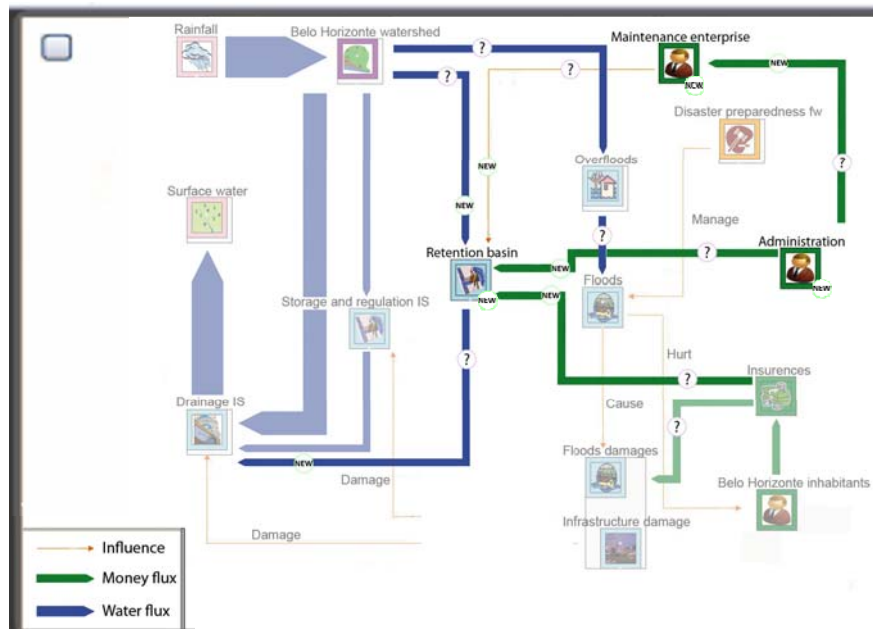
## Building a strategic system view



## Building a strategic system view

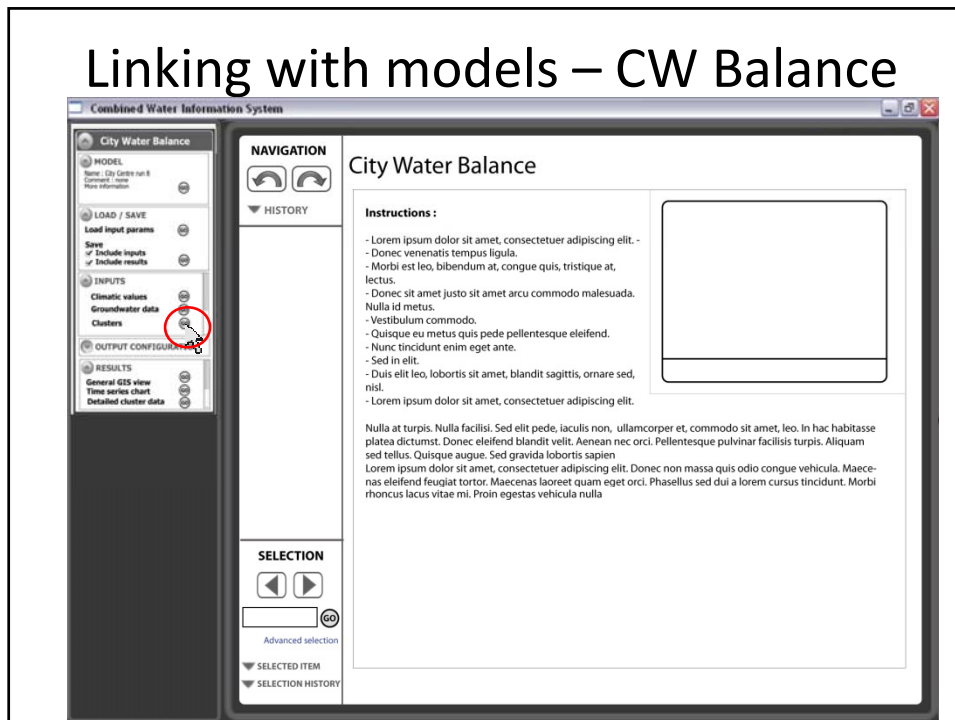


## Building a strategic system view

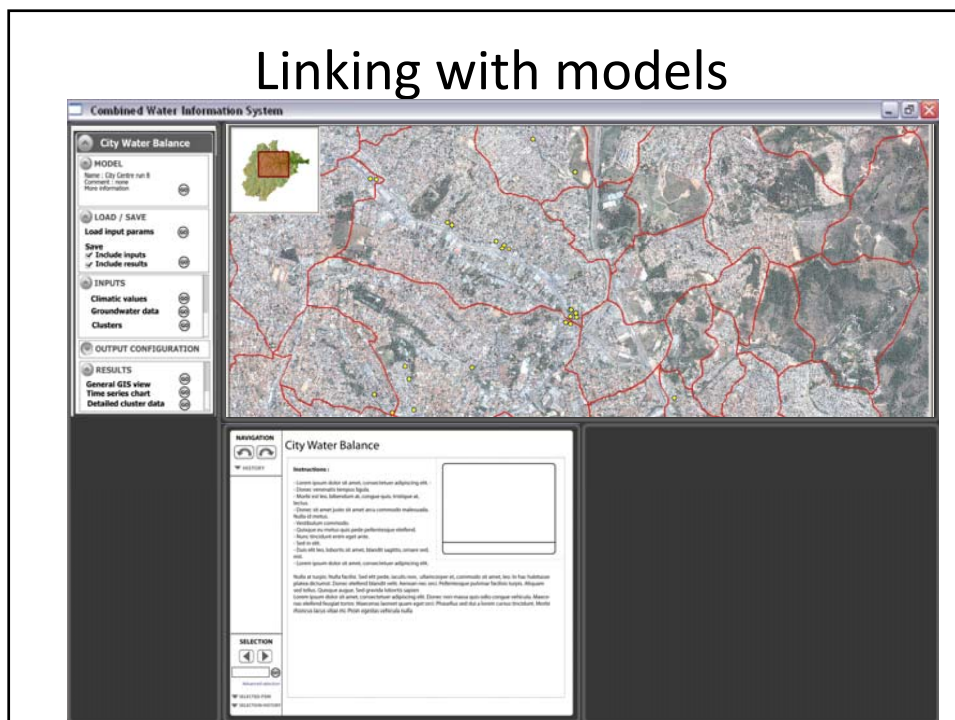


- How to rapidly evaluate a strategy using a model?

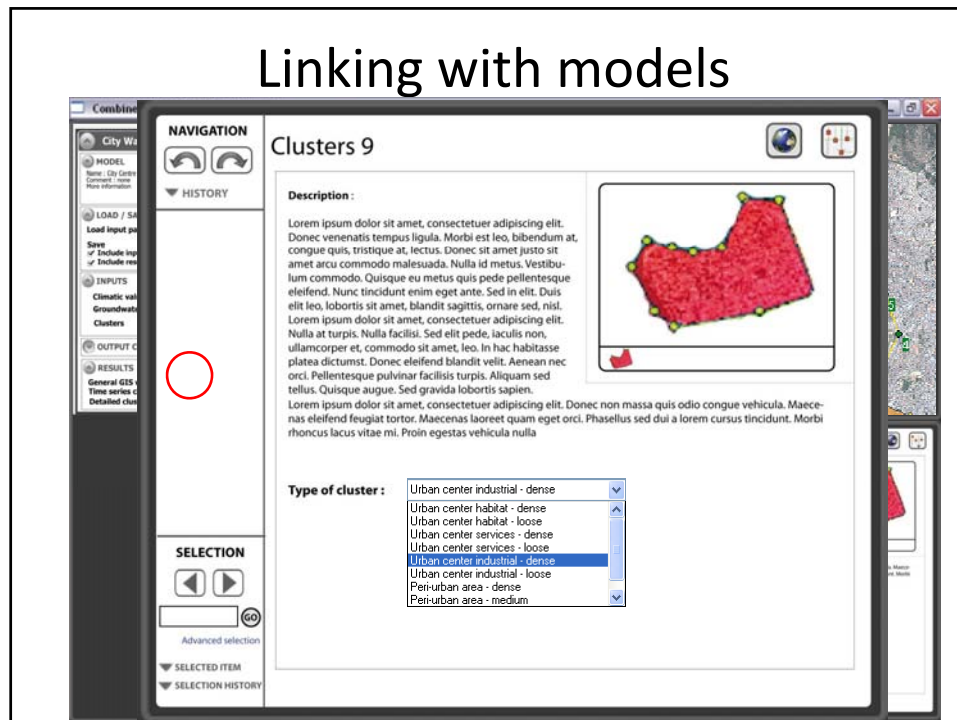
## Linking with models – CW Balance



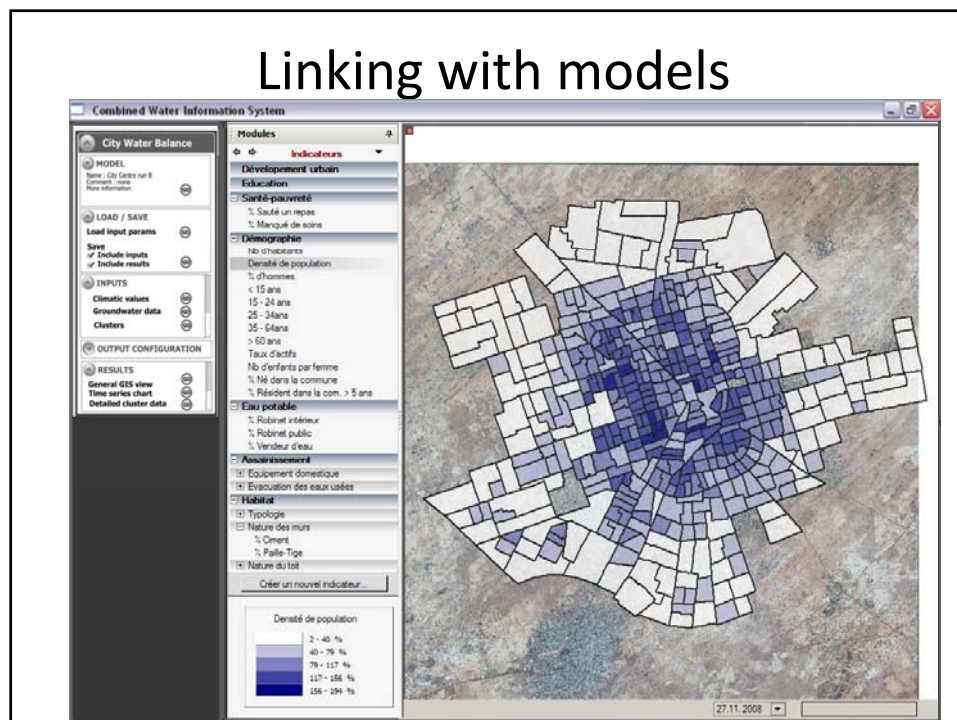
## Linking with models



## Linking with models



## Linking with models



## **PART 4 : CONCLUSION & OUTLOOKS**

### Conclusion

## Outlooks

- Make SWITCH results visible with the CWIS Inventory.
- by providing:
  - A **short fact sheet** containing: Title, Contact details, Development stage, Description, Critical factors, Cost indication, Implementation steps and References.
  - A **list of parameters** which characterize the solution (i.e. water demand, water quality, detailed costs, input/output values...)

Last slide of presentation



## Question for workshop

The cities are the users of City Water

**In what ways will City Water be most valuable to your city for strategic planning?**

To help -    Information system?  
                  Models?  
                  Inventory?