City Water Stories:
Lyon

the international water association

Population
- 1.5 million inhabitants in 2016.

Geography
- 59 municipalities on 53000 km². The Lyon Metropole administration is global for the whole territory and is in charge of urban development and services (water systems, urban transport, waste collection and cleaning, energy, and also economic, digital and social development).

Main challenge
- Urban heat islands, droughts with stress (quantity and quality) on water resources (groundwater and Rhône River) and increasing the attractiveness of the city center for people and business.

Main solution
- Reconciling with the aquatic environment and for the wellbeing of the population, will increase natural areas and permeability in the city.

A Growing Metropole Adapting to Climate Change

Water is a key element for citizens and for the overall liveability of a city. The Lyon Metropole benefits from abundant resources from the Rhône River and the associated groundwater, supplying its inhabitants with clean and safe water on a daily basis. The wastewater treatment system (3200 km of sewage network and 12 treatment plants) ensures high pollutant removal rates and thus keeps environment and ecosystems clean and healthy. During rain events, 50% of the runoff is infiltrated directly by green infrastructure and the other 50% is collected in the sewage network. 5 to 10% of this collected runoff is discharged without treatment into rivers by overflow structures. One of the main challenges over the last 10 years is finding solutions to keep the overflow fraction below 5%.

Between now and 2030, Lyon expects its population to grow by 300 000 new inhabitants, of which 150 000 in the CBD. The densification of the city is likely to pose many problems if not well planned, such as increasing imperviousness, over-use of groundwater, increased flood risks, and higher pollution of aquatic ecosystems through inadequate stormwater management. Therefore the regional and metropolitan government initiated the Masterplan for Territorial Coherence initially approved in 2010 and more recently expended to the 59 municipalities of the Metropole. It intends to support the development of a dense urban core, with priority to service the highly populated areas and to ensure adequate and fast public transit, while also protecting the environment and the natural water resources of the territory through increased resilience measures. Rainfall and flooding risks have been analysed and mapped in the masterplan. New regulations are currently being discussed in order to reduce the vulnerability (by reducing urbanisation in risky areas) and to control natural risks.

Lyon Metropole is also facing challenges associated with the impacts of climate change, which are likely to increase the number and intensity of droughts in the region. Securing alternate water resources, as well as the reduction and prevention of urban heat islands are important components integrated in the urban planning of Lyon and in the climate masterplan.

A City that Lives with Water

With over 20 years of experience in integrated water resources management (IWRM), Lyon Metropole has updated its urban masterplan in order to develop the city around its water resources. Combining urban liveability with the current water resources, Lyon Metropole developed new and bold perspectives for urban planning and the ambition of a city that lives with water.

As part of the masterplan, the « Miribel Jonage » area was redeveloped to include natural flooding areas upstream of the City to better protect it against flooding from the Rhône. This area also offers a secondary water supply source, a recreational zone, and a wetland network with the richest biodiversity in the region. In the city itself, the riversides have been transformed to provide city dwellers with a connection to their waterways, raising awareness to water benefits and risks. Lyon Metropole's vision is to be able to sustainably preserve the quality of its environment and all aquatic ecosystems in the basin in order to preserve the natural water cycle in urban areas and beyond. It recognises that integrating water in urban planning is key to achieve this.

Case Study: Porte des Alpes

Porte des Alpes is a 140 ha high-tech industrial blue and green area welcoming 150 companies and 6500 employees (data 2012). Two lakes store temporarily stormwater before infiltration, host a great biodiversity of flora and fauna, and welcome local workers and other citizens for outside lunch and recreational activities. 90 % of the park is open to the public. New management and maintenance practices (combining previously separated technical services dealing with stormwater, roads, parks and gardens) have been created.

GRANDLYON la métropole

Lyon's Journey to Become a Water-Wise City

A closer look at how Lyon is satisfying the IWA Principles for Water-Wise Cities

1 Regenerative Water Services

Replenish Water Bodies & their Ecosystems

✓ Infiltration of stormwater at source as in the water regulation and now in the urban masterplan.

Reduce the Amount of Water & Energy Used

✓ Reduce water loss in the network and reduce the use of water by the solid waste department.

Reuse, Recover, Recycle

✓ New regulation in the urban masterplan to encourage the reuse of rain water.

Use a Systemic Approach Integrated with Other Services

✓ A single Metropole department for the urban water cycle including stormwater management and protection of aquatic environment in the 59 municipalities.

✓ **Increase the Modularity of Systems & Ensure Multiple Options**

Work is focussed to reduce vulnerability and control the increase of risk.

2 Water Sensitive Urban Design

Enable Regenerative Water Services

✓ The permeable city project is developing new approaches to i) implement more best management practices and ii) extend the use of green infrastructure to infiltrate stormwater.

Design Urban Spaces to Reduce Flood Risks

✓ Maps of risks and regulation for minimum floor level in new buildings in high flooding risk areas.

Enhance Liveability with Visible Water

✓ Restoration and renovation of river banks along the Rhône and Saône rivers, and in Lyon Confluence new district.

Modify & Adapt Urban Materials to Minimise Environmental Impact

✓ Zero phyto measures (i.e. no pesticides) in progress!
Use of biofilters and constructed wetlands to treat overflows.

3 Basin Connected Cities

Plan to Secure Water Resources & Mitigate Drought

✓ Include in the urban masterplan the water resource protection zones.

Protect the Quality of Water Resources

✓ Lyon Metropole water department is developing guidelines and regulations since 2008.

Prepare for Extreme Events

✓ Maps of global rainfall risk and related regulation are included in the urban masterplan.

4 Water-Wise Communities

Empowered Citizens

✓ Large projects are open for public consultation.

Professionals Aware of Water Co-Benefits

✓ Founding and active member of GRAIE, a French NGO based in Lyon, which aims to transfer and share knowledge and practices on urban water systems and management between researchers, municipalities, consulting companies, public and private utilities, and administrations.

Transdisciplinary Planning Teams

✓ The Porte des Alpes project was developed with a multidisciplinary team.

Policy Makers Enabling Water Wise Action

✓ Collaboration between all departments of Lyon Metropole.

Leaders that Engage and Engender Trust

✓ Leaders promote & support the project of Lyon as a "permeable city."

5 Building Blocks for Lyon on the journey to water-wise cities

Vision

Water and trees in the city to develop a permeable and resilient city, which reduces urban heat island effects.

Governance

All stakeholders of Lyon Metropole work together to reduce GHG emissions and to establish and implement a climate change adaptation plan.

Also in preparation, a new local strategy to manage flood risks at a scale far beyond the Lyon Metropole administrative territory: the strategy and action plan will be coordinated by Lyon Metropole in close collaboration with stakeholders from the neighbouring territories.

Knowledge & Capacity

European research projects dealing with urban water systems (e.g. PREPARED, Aqua Add) or associated with other European, French and regional projects (e.g. APUSS, GEPETO, etc.), allowing exchange of data, knowledge, expertise and capacities.

Member of the multidisciplinary research federation OTHU.

Planning Tools

Urban masterplan for the 59 municipalities of the Lyon metropole including risk regulation (flooding, rainfall, technological risks, geotechnical risks).

Climate change adaptation plan.

Implementation Tools

Cost benefit analysis of using green infrastructure for stormwater management.