Objectives

The LIFE ADSORB project seeks to test new methods of decontaminating water mainly from rainwater runoff from the ring road with rare contributions from wastewater. The objective is to reduce 95% of mineral and organic pollution (macro and micro pollutants).

Background and Objectives

Achieving good status for surface water bodies is one of the key environmental challenges facing European cities. Rainwater from runoff from heavily trafficked roads is one of the major pollutant pressures in micropollutants and, if not (or insufficiently) treated, constitutes an obstacle to achieving good status. This is particularly the case for dissolved pollution that is not intercepted by conventional management systems that implement decantation or even filtration.

In Paris, an emblematic area of environmental issues in an urban environment, the Bugeaud overflow (Bois de Boulogne) directly discharges rainwater from a section of the ring road into the Seine.

In order to improve the quantitative and qualitative management of these urban discharges during rainy weather (RUTP), the City of Paris has set up a full-scale demonstrator of the reed bed filter type in the Bois de Boulogne as part of the European LIFE ADSORB project. The substrate of this filter allows (i) the surface retention of particulate pollutants associated with suspended matter and (ii) the adsorption of dissolved metallic or organic micropollutants (metals, hydrocarbons, alkylphenols, phthalates) via the integration of a material with specific properties. The aerobic conditions prevailing in the filter between two rain events also make it possible to consider the implementation of biodegradation processes for the organic pollutants thus adsorbed.

The Life Adsorb project therefore aims to test this new method of decontamination which focuses on pollution, whether dissolved or particulate, from runoff water from high-traffic roads, integrated into a natural rainwater management/treatment solution.

> *Given the specific context of this project, which takes place in a classified wooded area serving as a biodiversity reservoir, it will also be necessary to demonstrate the compatibility of contaminated stormwater management objectives with the preservation of natural heritage and biodiversity.*

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Héron - faune présente sur le site

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METHODOLOGY

Three tasks and their associated methodologies will enable the achievement of these objectives:

Evaluation of Hydraulic Efficiency and Pollutant Removal of the Demonstrator

The quantitative and qualitative monitoring of this demonstrator site will help calibrate and validate retention/degradation models for micropollutants within this type of structure, which will be integrated into software assisting in the design of this system. Laboratory experiments will also characterize the adsorption capacities of other materials, which can then be incorporated into the software.

Modeling and Design Assistance Tool

This involves modeling the water and pollutant flows and stocks within the prototype to evaluate its performance, analyze the processes involved, and adapt operating conditions for optimal performance. This modeling will facilitate the extrapolation and transferability of the technology to other contexts. The simplified model developed will enhance the ORAGE design assistance tool (open-source software) developed under the ADEPTE project (http://www.adepte-pluvial.org/ (http://www.adepte-pluvial.org/)) by adding a "micropollutants" module.

Assessment of Environmental and Socio-Economic Impacts

A pre- and post-construction evaluation will focus on the environmental impact of the prototype and its operation on surrounding ecosystems.
A characterization and analysis of actor networks (their knowledge and organizational practices) that should contribute to the effective operation of the system will be implemented to better anticipate potential organizational or cognitive barriers and obstacles.