

EMSCHER: URBAN STORMWATER MANAGEMENT IN THE EMSCHER REGION



Urban Stormwater Management (USWM) plays an important role in the Emscher restoration project. To enable river revitalization, a reduction of stormwater runoff is necessary. Beside of four demonstration projects for SUDS (sustainable urban drainage), a catchment wide strategy to implement SUDS in existing combined sewer systems will be explained.



Figure 1: The Emscher before



...and after the restoration process

INTRODUCTION

With the ceasing of the mining activities in the 1980's the opportunity for a restoration of the Emscher – a river in Western Germany in one of Europe's most densely populated and industrialized areas – was given.

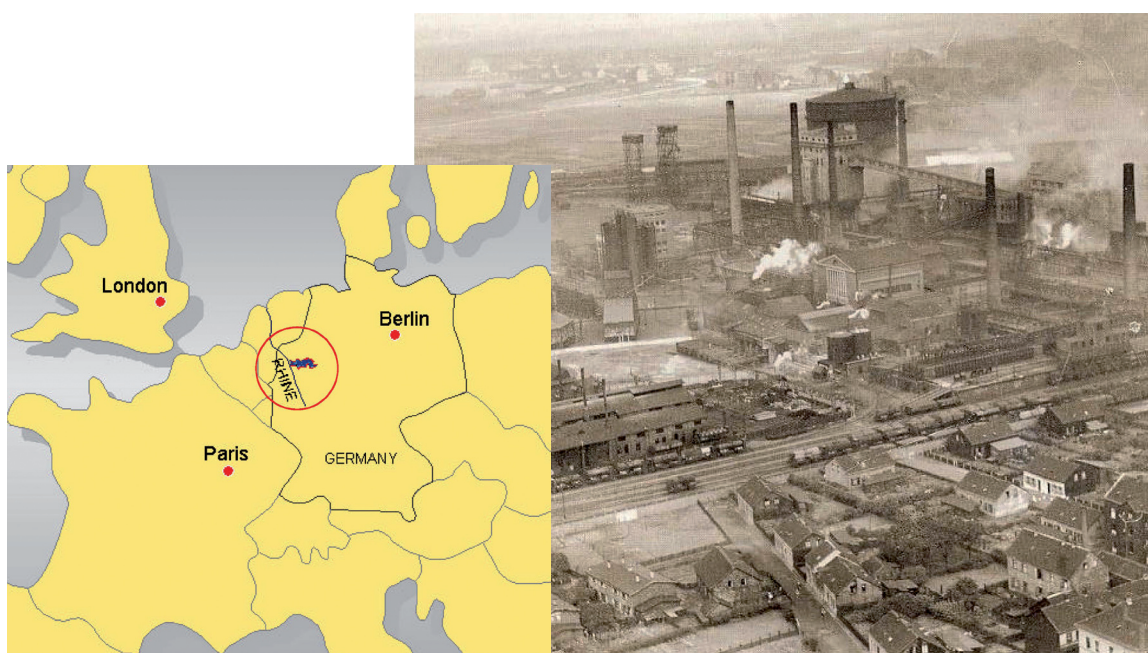
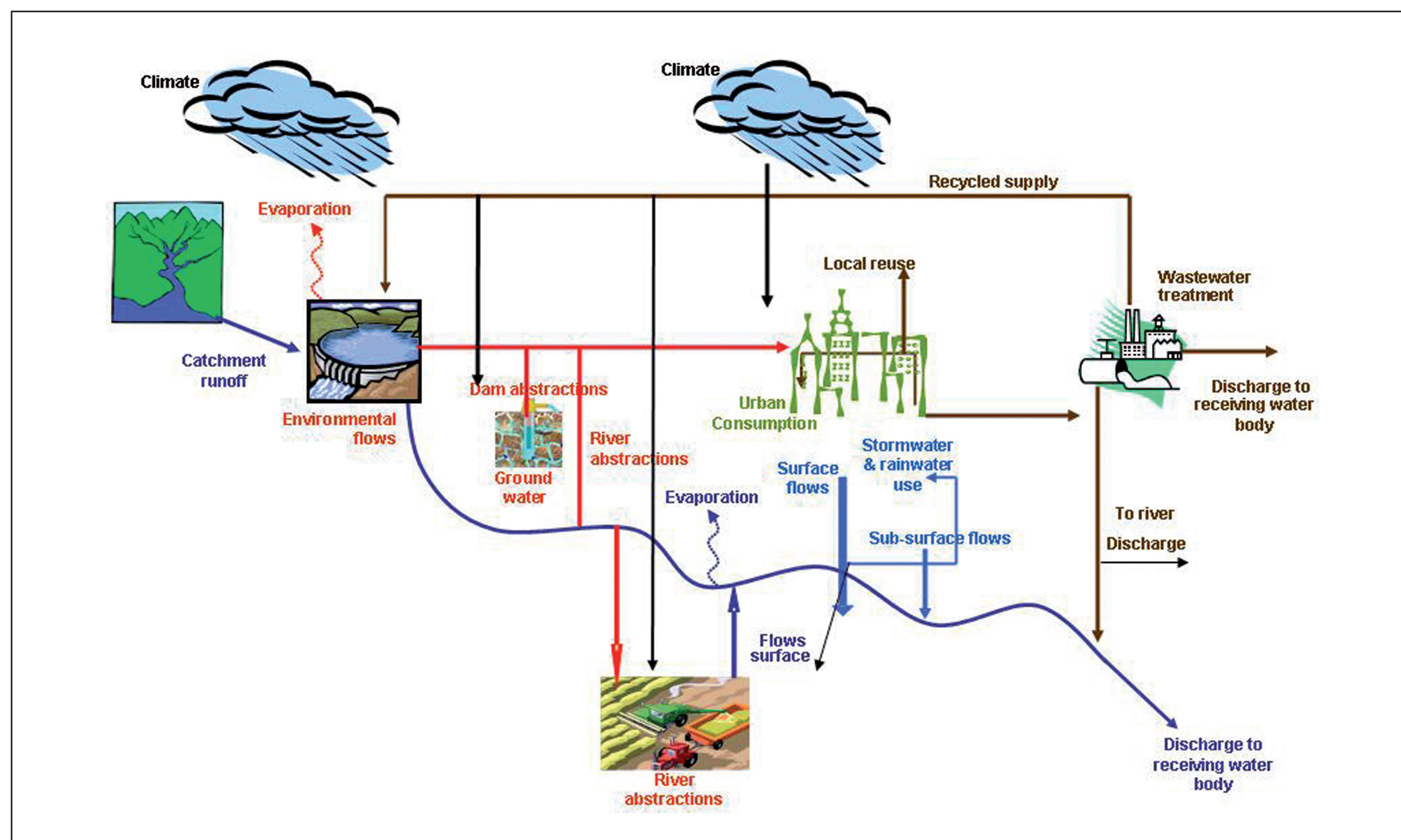


Figure 2: Location of the Emscher catchment, former heavy industry

Due to the high level of urbanization the flow regime of the Emscher is strongly influenced by stormwater runoff. In addition, combined sewer overflows are causing water quality problems and hydraulic stress. A significant reduction of stormwater discharge is necessary to enable the revitalization of the Emscher and its tributaries.



PROJECT "15/15"

Aware of these problems, the water board Emschergenossenschaft introduced new source oriented stormwater management strategies at an early stage. Since the 1990's many pilot projects for SUDS have been realized. With good experiences, in 2000 the phase of catchment-wide implementation had been entered. In 2005 the Emschergenossenschaft and its 17 member municipalities signed a contract to disconnect 15% of the catchment area connected to the combined sewer system today (266 km²) in the next 15 years. This is a commitment for the disconnection of approx. 26.4 billion m³/a!



Figure 3: Swale trench system in Gelsenkirchen (left) built in 1992, Disconnection project in Bottrop (right)

SWITCH DEMONSTRATION PROJECTS

a) WelheimerMark in Bottrop In the residential area "WelheimerMark in Bottrop mainly roof areas have been disconnected to reduce runoff volume and peak flow.



Figure 4: SUDS in the Welheimer Mark area

b) Klöcknersiedlung in Waltrop

In the settlement Klöcknersiedlung in Waltrop the runoff from roads will be managed in "pocket wetlands" to minimize the hydraulic load of the combined sewer system. With planning in progress, implementation is scheduled for 2009.

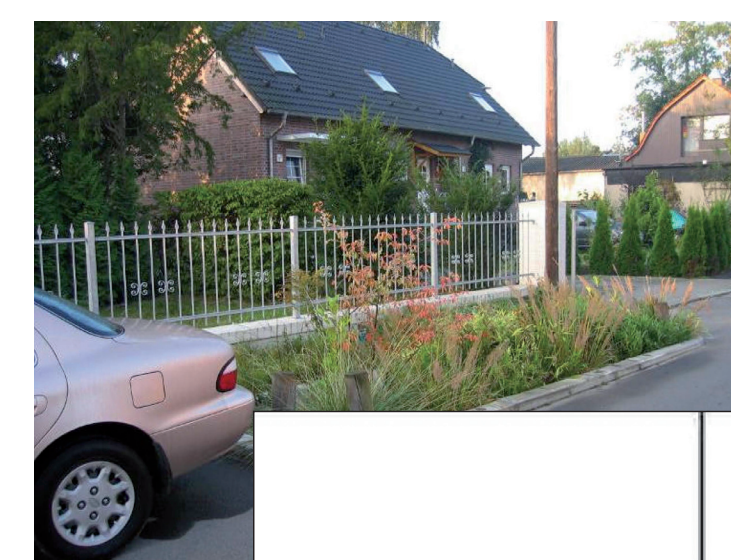
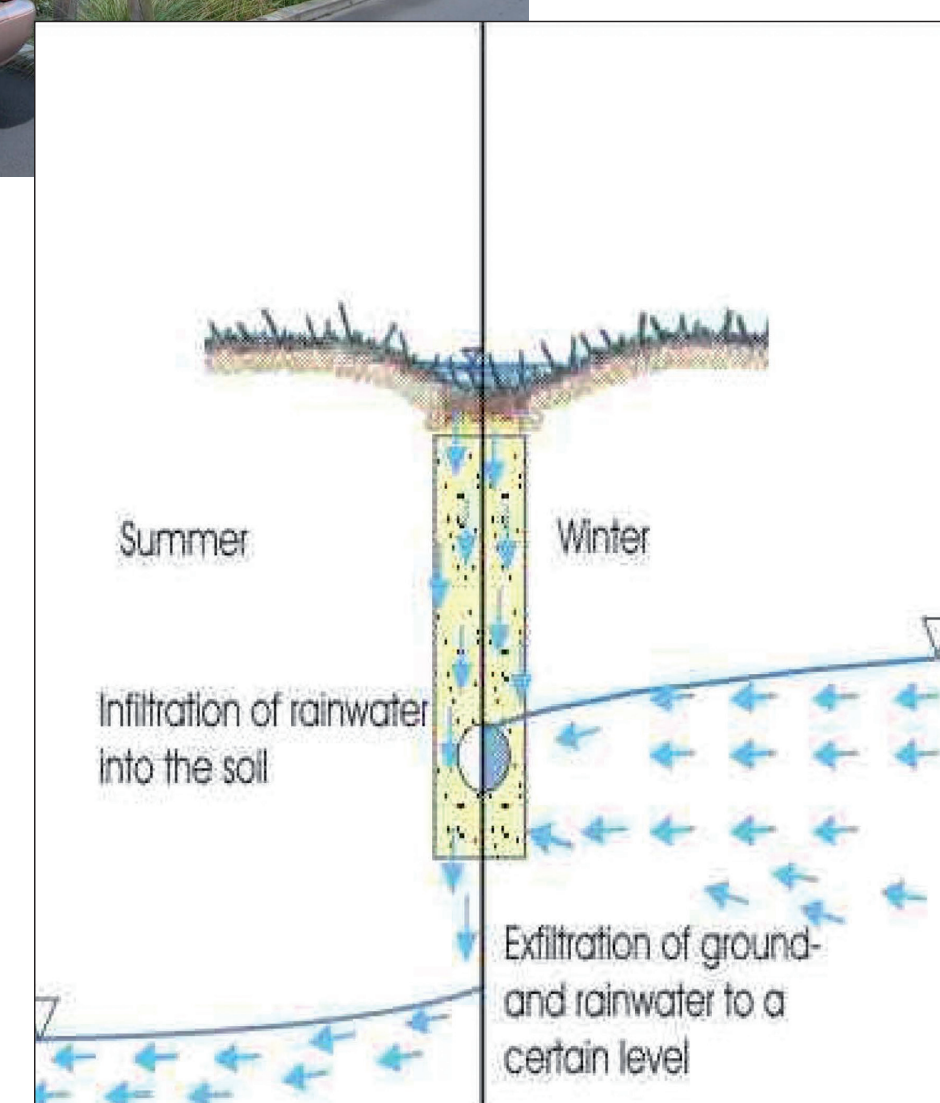


Figure 5: "Pocket wetlands" (top), Principle of DIS-System (bottom)



c) Drainage-Infiltration-System (DIS) in Herne The DIS in Herne is a pilot project for the combined management of stormwater and groundwater. Planning is finished, implementation is scheduled for 2009.

d) Lake Phoenix in Dortmund Lake Phoenix should demonstrate how open water systems can be integrated into urban space. Construction is in progress.

Information on other USWM projects in the Emscher region can be found on the website of the Emschergenossenschaft (www.eglv.de).