



BE PREPARED: BERLIN, GERMANY



<http://www.prepared-fp7.eu/>



BERLIN'S DEMOS

(1) Managing substance flows within the Berlin water cycle under climate change conditions

Berlin's drinking water supply traditionally relies on natural water treatment methods such as bank filtration and artificial groundwater recharge from groundwater in the vicinity of the city's abundant lakes and rivers. Under the perspectives of reduced surface water discharge and decreasing groundwater recharge, this resource is especially vulnerable towards waste-water related substances that are poorly degradable in the subsurface or even persistent. This is true for trace organics as well as salts such as sulphate.

Within PREPARED different options for managing the water quality, such as optimised well-field operation and additional treatment steps, were evaluated with respect to efficiency, costs and environmental impact. For one demonstration water works it was shown that by operating wells within certain limits further effort for treatment is not necessary for the predicted source water concentrations.

(2) Planning instrument for an integrated and recipient/impact based CSO control under conditions of climate change

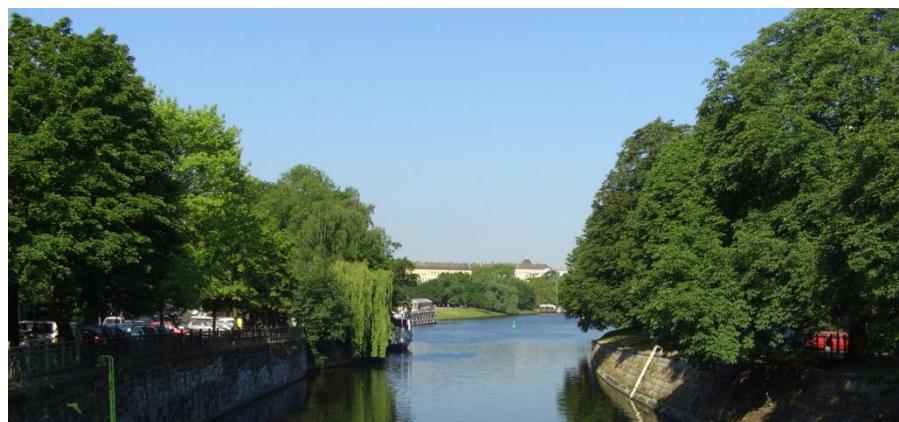
Within PREPARED, a general approach for a planning instrument was developed that links (i) a sewer model to simulate volume and/or pollutants in CSO with (ii) a surface water quality model to simulate the effects in the receiving water and (iii) an impact assessment method to evaluate the severity of CSO impacts.

Demonstration of the general approach is carried out for the Spree River in Berlin, where depressions in dissolved oxygen (DO) in the river after CSO were identified to be of concern. To represent DO development correctly, a hydrodynamical ecosystem approach was chosen for the Berlin planning instrument by combining (i) the sewer model Infoworks CS, (ii) the river water quality model QSim and (iii) duration-thresholds of DO to define suboptimal and critical conditions for the local fish fauna.

The following climate scenarios will be run:

1. Higher water temperature (T)
2. Scenario 1 with more intense summer rainfall
3. Scenario 1 with less intense summer rainfall

In addition to the climate scenarios, changed CSO management will be tested, thus allowing to evaluate which investments will bring maximum benefit.



SUCCESS STORIES

Ensuring natural drinking water treatment for the future

By introducing smart well-field management Berlin can continue producing drinking water through bank filtration and artificial groundwater recharge from its rivers and lakes, thus saving **140 Mm³ per year** of naturally-recharged groundwater.

Maximising the effect of €20 million to be spent:

By modeling the effect of different CSO management options onto surface water ecosystems, the investments planned by the Berlin Senate of €20 million within the next 5 years can be focused on measures that bring maximum benefit.



CHALLENGES

Water scarcity:

due to decreasing precipitation (- 10 % until 2040) and increasing temperatures (leading to an increase in evaporation of about 2%) the discharge in the Elbe catchment is predicted to decrease significantly (- 40%, Hattermann et al. 2005). This will lead to a rise in treated effluent share in the city's surface waters, especially during summer.



Extreme rain events:

In Berlin's city centre, representing a quarter of the total Berlin area, waste water is drained by a combined system collecting both sewage and storm water. For rainfall events above 5 mm, combined sewer overflows (CSO) can reach urban rivers, impairing their ecological quality several times per year. In order to limit the impact of CSO, and contribute to the protection of surface water quality in Berlin, a large mitigation programme is being implemented.

PARTNERS



PREPARED is a Collaborative Project funded by the European Commission under the seventh Framework Programme; contract no. 244232

Demonstration Manager: Regina Gnirss (regina.gnirss@bwb.de)