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Micropollutant Emissions from German Municipal Wastewater Treatment Plants – A Nation-wide Monitoring

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Introduction

The European Union (EU) has defined environmental quality standards for priority and priority hazardous substances (PS) in surface waters. It is a joint task of water scientists across the EU to establish concentration levels in surface waters in compliance with the quality standards and take appropriate measures if the quality targets are not achieved. For the implementation of effective measures, it is necessary to know the main source of pollution. A major pathway for PS emissions into surface waters is the municipal wastewater system (treatment plants, storm water and combined sewer overflows). A significant portion of PS emissions comes from point sources.

Monitoring Design

In order to create a reliable data base for assessing the contribution of municipal wastewater treatment plants (WWTP) to the overall PS emissions 49 plants throughout Germany will be monitored for 12 months following a standardized procedure. The procedure was developed and tested at 3 WWTPs. It included recommendations for the sampling , the handling of the sample and lab analysis. Long-term composite samples were analyzed with very sensitive methods.

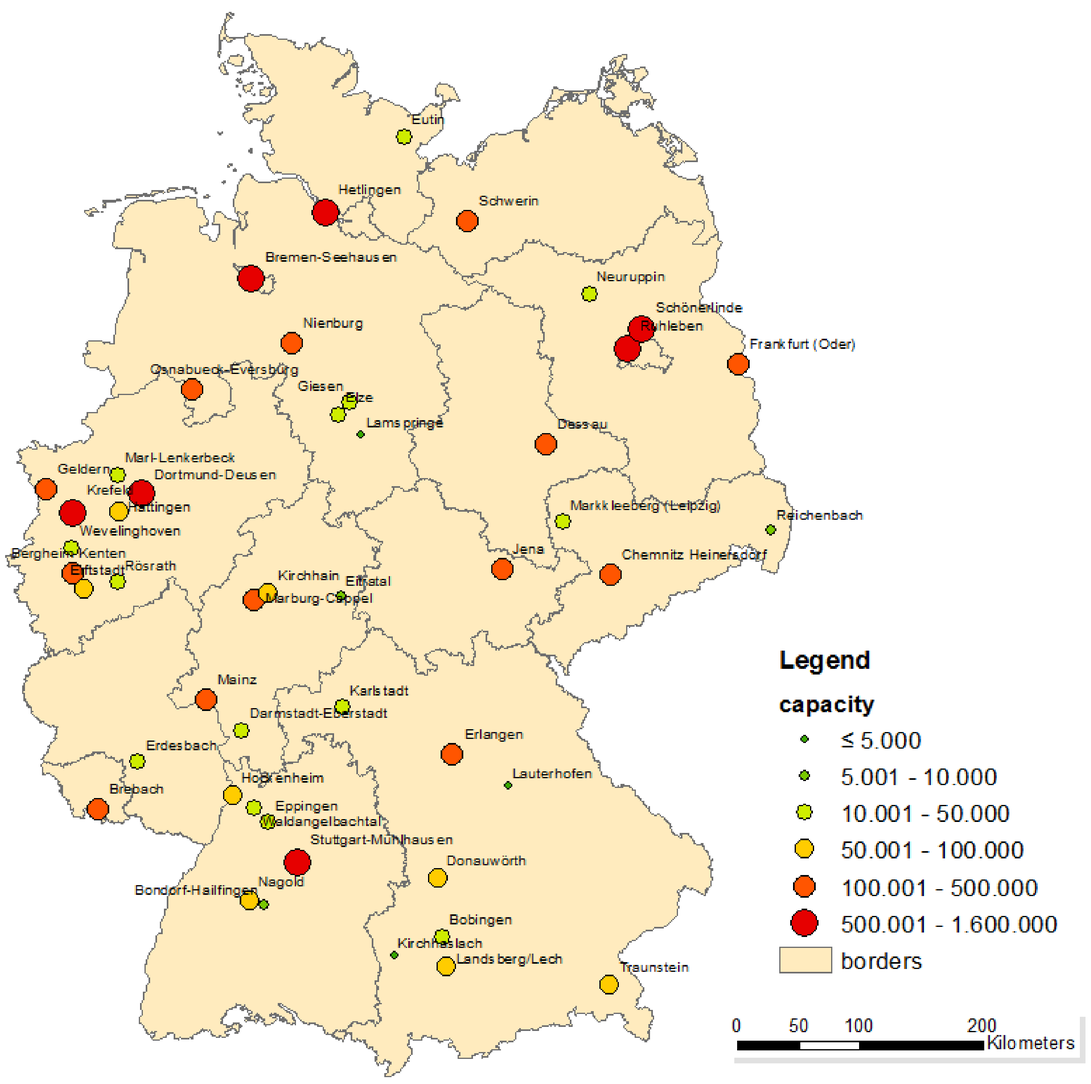

Figure1: Location of WWTPs

The sampling follows the established routine at the WWTP as far as possible. Sampling is performed over 7 days with automatic samplers to obtain 7 days composite. Every day one liter of daily composite samples, is frozen in a stainless steal vessels to compile the 7 days composite sample. Stainless steel vessels have proven to be the best compromise, both in terms of ease of use (cleaning, stability) and keeping the samples intact.

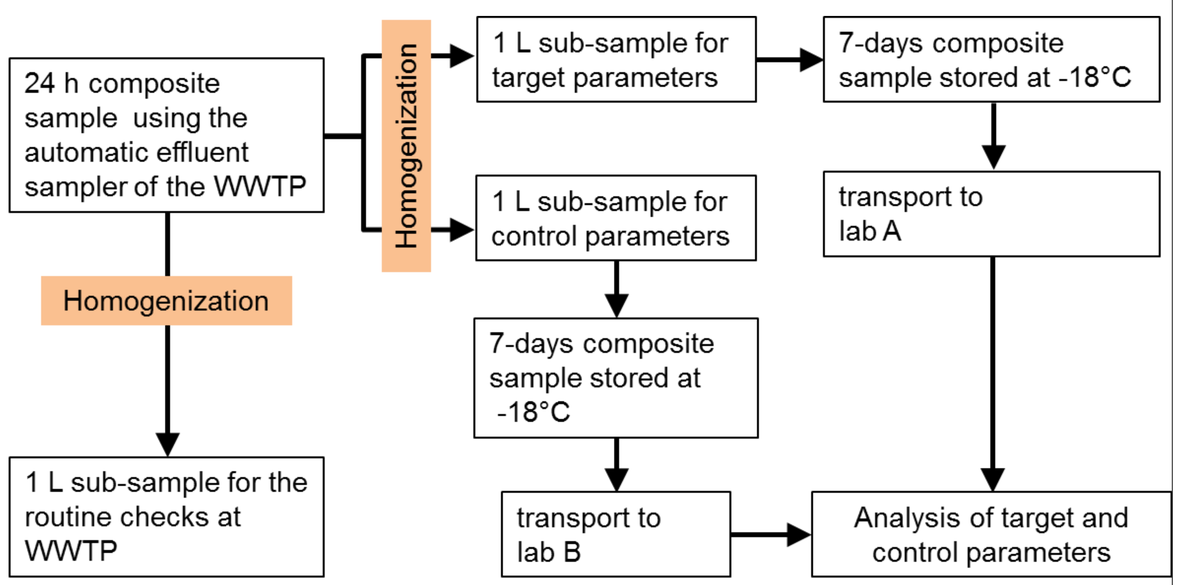

Figure2: Schema of sampling procedure

Control parameters like ammonia and nitrate are considered to describe the current operation status of a WWTP. If the analyses of the target and control parameters are performed in the same lab one 7 day composite sample is sufficient. The sampling method described is well suited to considerably reduce fluctuations in the analysis results generated. This is an enormous advantage if the number of samples to be analyzed are limited.

The analysis in the laboratory includes the following parameters:

- **heavy metals**
- **pesticides and biocides**
- **industrial chemicals**

The monitoring at WWTP focuses on effluent concentrations. However at 5 WWTP inflow and sludge streams are analyzed to assess the overall pollutant removal efficiency and the contribution of the mechanical and biological processes.

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