

EGU21-8325

<https://doi.org/10.5194/egusphere-egu21-8325>

EGU General Assembly 2021

© Author(s) 2022. This work is distributed under the Creative Commons Attribution 4.0 License.



Low-Budget Sewage Overflow Monitoring

Caroline Spill, Lukas Ditzel, Nora Brumm, Julia Böhm, and Matthias Gassmann

Kassel, Wasser, Abfall, Umwelt, Hydrologie und Stoffhaushalt, Kassel, Germany (caroline.spill@uni-kassel.de)

Sewage overflows in headwater catchments are critical, mostly not well monitored point sources for many pollutants such as oxygen depleting substances, pharmaceuticals or heavy metals. The outlets are often located at places where no connection to the power grid is available, hence it is often necessary to provide deployed sensors or sampling devices with mobile power sources like car-batteries. In addition, autosamplers or on-line sensors are expensive devices. For these reasons, a proper monitoring strategy, including water quality parameters in these structures is often complicated to implement and from an economical point of view not reasonable. Therefore, we combined two low-budget DIY devices, a modified Zurich sequential sampler for time-discrete rainfall samples and Stream Temperature, Intermittency, and Conductivity loggers (STIC), to build a low-budget monitoring system being able to take time-discrete samples from sewage overflow. Our modified sampler collects 12 samples in a row, with variable volumes from 0.25 to 0.5 L. In each bottle a STIC was implemented. The STICs start to measure a conductivity higher than zero as soon as water starts to flow into the bottle. This allows for a clear assignment between sample and time. We called this sampler the Sewage Overflow Monitoring Sampler (SOMS).

Though the probe volume and the time period for sampling is strongly limited, concentration variations, including peak concentrations, in sewage overflows are expected to be measured right at the beginning of an event (first flush) and should be therefore covered by the sampler. First laboratory tests were successful. In the next step the monitoring system will be implemented on a field side.

Depending on the scientific question of the study, the SOMS can be complemented in the field by either another STIC logger or a pressure probe. The STIC logger is located at the bottom of the canal. This allows the detection of the duration of the overflow event. By installing a pressure probe the discharge can be approximated as long as gradient and the geometry of the canal is known.