

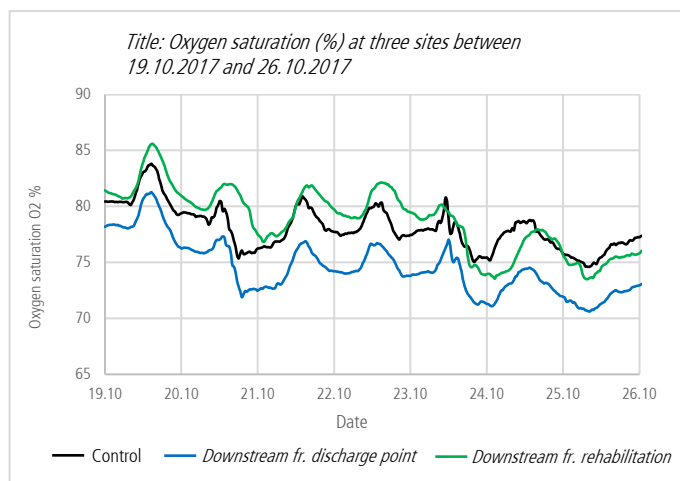
## Water quality

### Application of YS/EXO1 multiparameter probes with ecoTech enviLog Mobil data logger in a river setting

*Monitoring the influence of sewage treatment plant discharge on river water and examining the rehabilitation success downriver from the discharge*

The release of treated sewage into a river effects the natural properties of the water. Key physico-chemical properties can be impacted over long distances, thus also impacting the aquatic biology of the river ecosystem.

The Schleswig-Holstein Department of Agriculture, Environment and Regions (Department 4 Waters, Dec-nat 41 Rivers) is responsible for monitoring the rivers in Schleswig-Holstein as part of the implementation of the EU Water Framework Directive. To achieve this, the department carries out comprehensive monitoring of local river systems and water quality. Their monitoring program includes water sampling for analysis and on site monitoring. A further question examines the potential influence of the treated sewage on the daily changes in the physio-chemical characteristics of flowing water.

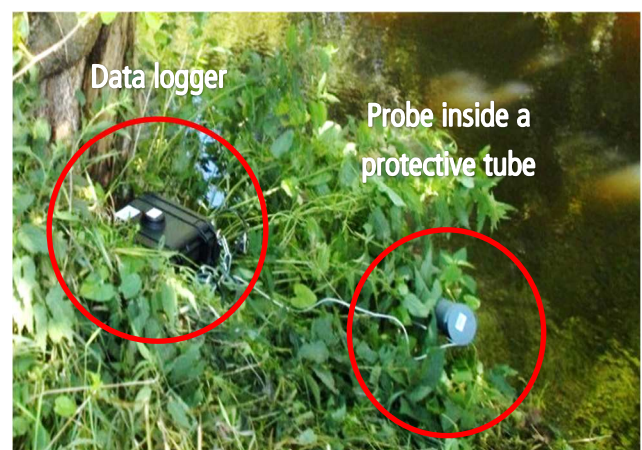


*Fig. 1: Weekly course of oxygen saturation [%] at the 3 sites. Control status (black) before the sewage treatment plant discharge, downstream from sewage treatment plant discharge (blue) and after the rehabilitation site (green). A decrease in oxygen saturation can be observed following the discharge of treated sewage. Data source: enviWatch, LLUR*



*Fig. 2: Installation of an EXO1 multi-parameter probe in the pipe with protection against floating debris. Source: Lukas, LLUR*

To collect data, three YS/EXO1 multiparameter probes were equipped with sensors to measure pH, temperature, conductivity, oxygen (optical) and water level. The probes were installed in flowing water for continuous measurement. The first probe was installed above the inlet of the sewage treatment plant to measure the "current state" (or control). The second probe was installed directly below the inlet, capturing the direct influence of the sewage treatment plant. The third probe was installed further downstream, after a section of rehabilitation work, and monitors the suspected improvement in water quality through rehabilitation works. The probes were equipped with an "enviLog Mobil" data logger and transmission device for rapid monitoring of changes. The data are transferred to the ecoTech enviWatch server and can be monitored, saved and graphically evaluated online. The probes were



*Fig. 3: Installation of EXO 1 and ecoTech enviLog Mobil above the sewage treatment plant inlet. The enviLog Mobil is attached hidden. The probe is protected from floating debris and vandalism in the plastic tube. Source: Lukas, LLUR*

## ecoTech application report

# Water quality

equipped with an "enviLog Mobil" data logger and transmission device for rapid monitoring of changes. The data are transferred to the ecoTech enviWatch server and can be monitored, saved and graphically evaluated online.

With the exception of brief maintenance and calibration cycles, and extreme weather events, for example, risk of ground ice, the probes remain in the flowing water all year round and continuously provide data on water quality. The data are statistically evaluated and, together with the water quality tests, monitor the success of the river rehabilitation. Furthermore, the set-up facilitates analysis on the impact of treated sewage on the water.

Application: Long-term monitoring of flowing water using multi-parameter probes and data transmission with a mobile GPRS data logger.



Fig 5: ecoTech enviLoc Mobil with connected YSI EXO 1 multi-parameter probe. Source: ecoTech environmental measurement systems user.

Instruments used: YSI "EXO1 multiparameter probe" with 10m depth sensor; YSI "EXO Sensor pH"; YSI "EXO Sensor Optical Oxygen"; YSI "EXO Sensor Temperature and Conductivity"; ecoTech "enviLog Mobil" for data storage and data transfer via GPRS; ecoTech "envi-Watch" data server for retrieving and displaying data.

Acknowledgments: Many thanks to Ms. Lukas from the Schleswig-Holstein Office for Agriculture, Environment and Regions for her detailed information and images on the application of the devices.

Learn more:

w: [www.ecotech-bonn.de](http://www.ecotech-bonn.de)

e: [hydro@ecotech-bonn.de](mailto:hydro@ecotech-bonn.de)

t: +49 (0)228 85 044 77 00

Address

ecoTech Umwelt-Meßsysteme GmbH

Klara-M.-Faßbinder-Str. 1A

53121 Bonn

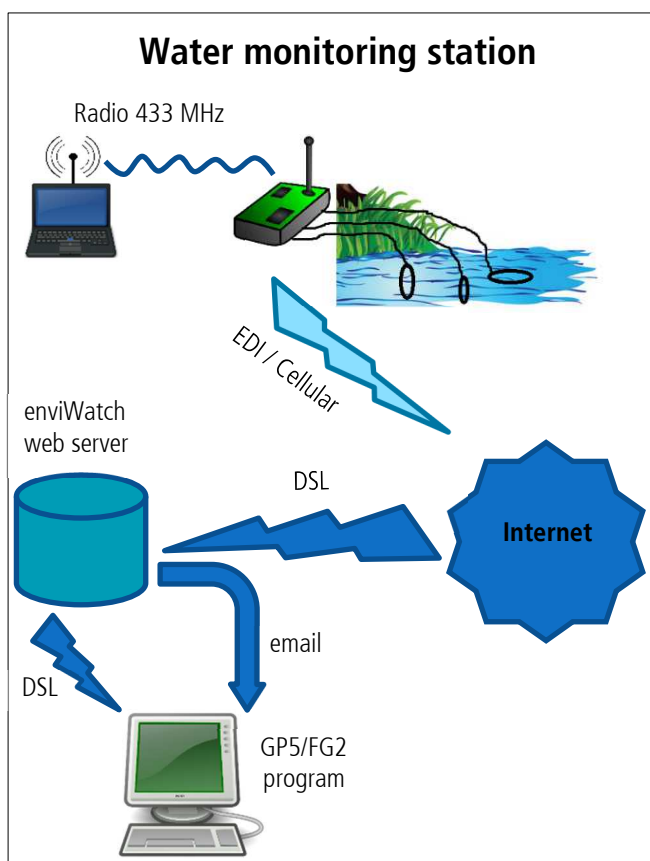


Fig.4. Example set up of the data transfer from the water monitoring station via enviWatch server to the user. Transmission of the data to a NAS data server or integration into an existing server is also possible  
Source:ecoTech