

## **Incorporation of Biofilm Activity in In-stream Biodegradation Modeling: a Case Study for LAS**

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A mathematical model was constructed which considers both biofilm and suspended biomass activity in relation to the biodegradation in rivers of individual chemicals. To calibrate this model for the surfactant LAS (Linear Alkylbenzene Sulphonate), experimental data were obtained in a lab-scale artificial river system, which allowed to collect accurate and reproducible in-stream biodegradation data next to all required river characteristics. Biofilm processes were shown to be by far the most significant removal mechanism of LAS in the considered system characterized by a large area to volume ratio. The biodegradation model could be fitted to the data using realistic parameter values. Subsequently, the model was tested by comparing its predictions to an in-stream removal field study in the Red Beck, a small Yorkshire river. Only easy to collect or default data were used as model parameters. The predicted overall LAS half-life (without any calibration using the field data) was 2<sup>3</sup>/<sub>4</sub>h, which is only 25% slower than measured in the field.