A novel multi-parameter approach to assess the effects of river restoration measures on the sediment matrix

> **Hochschule Karlsruhe** University of Applied Sciences



Alcides Aybar Galdos^{1 2)}, Stefan Haun¹⁾, Sebastian Schwindt¹⁾, Ruslan Biserov¹⁾, Beatriz Negreiros¹⁾, Maximilian Kunz¹⁾, Markus Noack²⁾

¹⁾ University of Stuttgart, Institute for Modelling Hydraulic and Environmental System ²⁾ Karlsruhe University of Applied Sciences





Colmation (Clogging of riverbeds)

Definition:

Infiltration and accumulation of inorganic and organic fine sediments in the gravel gap system of the river bed



Infiltration and accumulation of fine sediments (Schälchli 1993)

Fine sediments in the **gravel** matrix



no colmation



Picture: Aybar Galdos (2021)





MultiPAC – Multi-parameter approach for colmation

Four parameter approach to assess colmation in the field





Picture: Aybar Galdos (2021)







MultiPAC – Multi-parameter approach for colmation

Four parameter approach to assess colmation in the field

- a) IDOS [%] kf [m/s] 5.0E-03 1.5E-02 40 60 80 100 120 0.0E+00 1.0E-02 0 20 0.05 0.1 0.15 enttiefe [m] 0.2 .≝ 0.25 0.3 0.35 0.4 0.45
- \rightarrow Exemplary set of results using MultiPAC



- → clogging can be described by multiple parameter
- → vertical profiles ($\Delta z = 3$ cm) of hydraulic conductivity and DOC
- → "bulk" information about particle size distribution and porosity







Alcides Aybar Galdos E-mail alcides.aybar_galdos@hs-karlsruhe.de Telefon +49(0) 721 925 2470

University of Stuttgart Institute for Modelling Hydraulic and Environmental Systems (IWS)

> **Hochschule Karlsruhe** University of Applied Sciences

+IKA