# Modeling the Fate of Sediments and Attached PAHs in a Baseflow-Dominated River

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DFG

Integrated Hydrosystem Modelling

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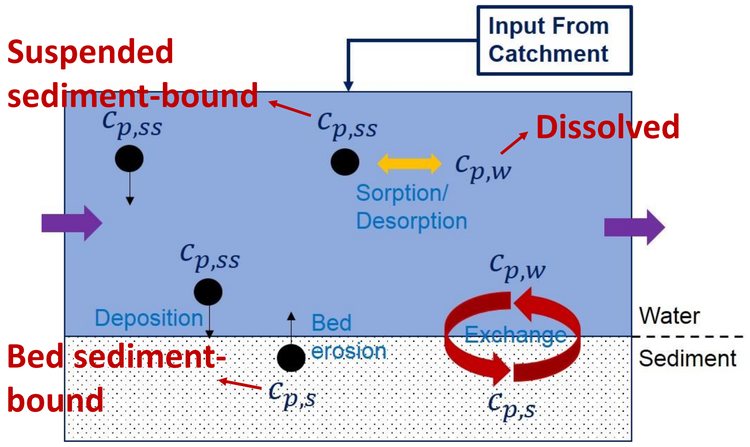
## Motivation

- Sorption to and transport with sediment particles facilitates transport of hydrophobic pollutants (e.g. polycyclic aromatic hydrocarbons, PAH) in rivers
- High suspended-sediment concentrations and strongly sorbing compounds impact water quality

⇨ Mechanistic models of sediment and sediment-facilitated transport ➡ fate of micropolutants

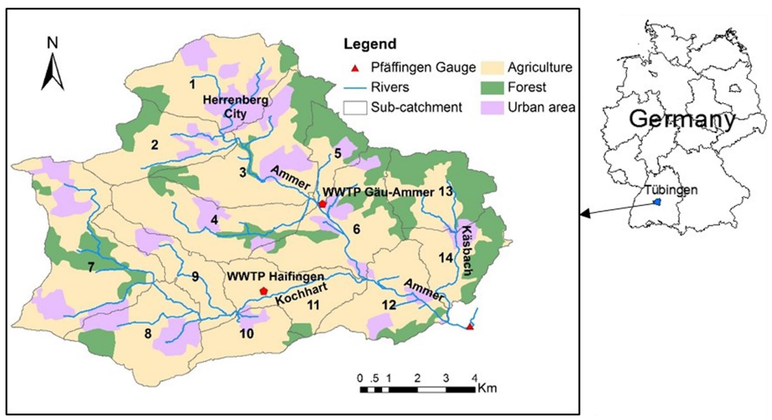
## Conceptual Model

- Well evaluated with turbidity and PAH measurements



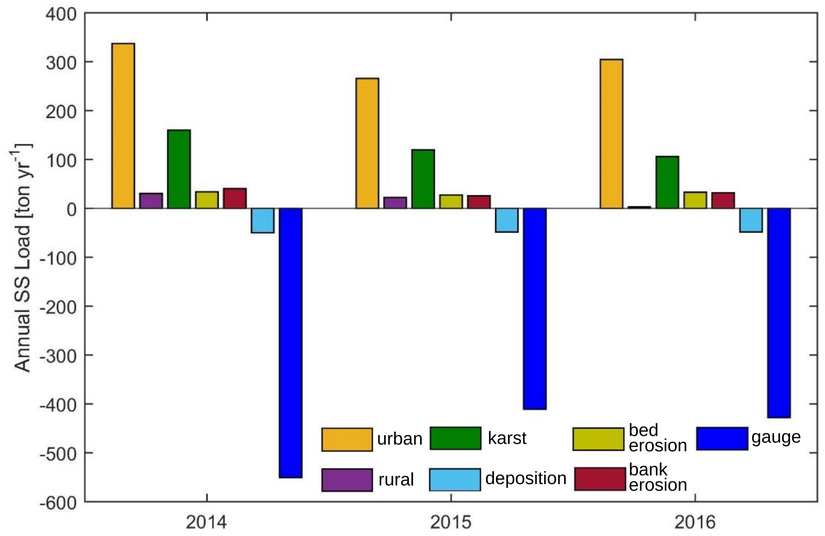

## River Ammer

- Baseflow dominated with a slightly hilly catchment
- Mean discharge ≈ 1 $m^3$ $s^{-1}$



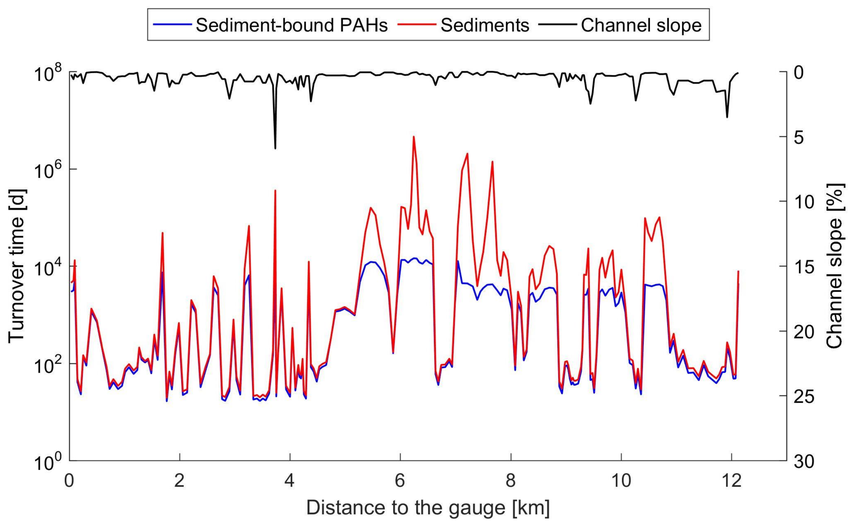

## Annual Suspended-Sediment Load

- **Urban particles dominate**



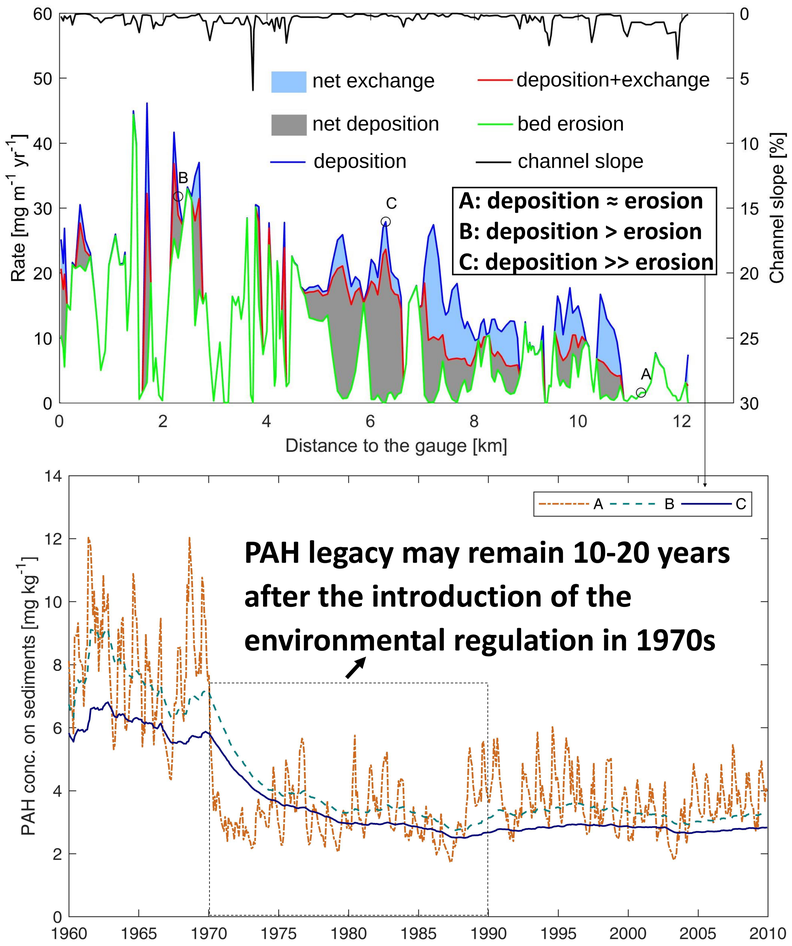

## Turnover of Sediments and Attached PAH

- **Steep reaches: sediment turnover ➡ PAH turnover**
- **Very mild river reach: diffusion of PAH from the river bed to water is relevant,** and **reduces PAH turnover times**




## PAH legacy in the Ammer River

- **Mild reaches: net sediment deposition**
  - **➡ PAH deposition**




## Conclusions

- Sediment supply determines to a large extent the PAH supply
- Sediment turnover governs the turnover of PAH in steep reaches, whereas diffusion plays roles in mild reaches
- PAH legacy may occur in the sediment trapping reaches

### References

Yan Liu, *et al.* (2018). Contributions of catchment and in-stream processes to suspended sediment transport in a dominantly groundwater-fed catchment. *HESS,* 22: 3903-3921.

Yan Liu, *et al.* (2018). Turnover and legacy of sediment-associated PAH in a baseflow-dominated river. *in preparation*