
The influence of fine sediment input on the interstitial space

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ABSTRACT

One of the few regions of China with a suitable climate for rubber cultivation is Xishuangbanna. Due to increasing demand of rubber in China's growing economy, the area of rubber cultivation increased drastically in the last few decades. The change in land use and the reduction of natural forest lead to increasing rates of run-off and erosion of fertile soil. Due to the introduction of the eroded sediment into the river serious negative impacts arise. The raising rate of suspended sediment is responsible for the infiltration of these particles into the river bed, resulting in a clogging of the interstitial space. The subsequently reduced hydraulic conductivity not only negatively affects the ground water recharge and ground water level but also the living space for fish and invertebrates. Hiding spaces for juvenile fish as well as spawning places for adult fish get lost.

In order to verify the impact of rubber cultivation on the substratum composition of the river bed and the habitat suitabilities for dominant fish species, two different numerical models are used and combined in this study. First a morphodynamic model is implemented to simulate the morphological changes due to the intrusion of suspended load. In addition sediment samples from the river bed as well as samples of suspended load are taken which serve as input data for the calibration of the morphodynamic model. The results are then applied to the habitat simulation model CASiMiR using a multivariate fuzzy-logic rule set based on expert knowledge.

First results of the morphodynamic simulations show that the change in river morphology can be identified and displayed with the numerical model. Alteration in grain size distribution will be compared to the measured data.