Geophysical Research Abstracts
Vol. 12, EGU2010-430-1, 2010
EGU General Assembly 2010
© Author(s) 2009

Spacial and temporal dynamic of fine sediment input in a small Swiss River in the foothills of the Alps

Yael Schindler (1), Christian Michel (2), and Christine Alewell (1)

(1) Environmental Geoscience, Environmental Science, Basel, Switzerland (yael.schindler@unibas.ch), (2) Man – Society – Environment, Environmental Sciences, Basel, Switzerland

Fine sediments are an often overlooked threat to our rivers and can determine stream quality to a large extent. Sediments in rivers cause increases in turbidity and sedimentation and can ultimately lead to clogging of the river bed. In general fine sediment loads in rivers are increasing throughout the world in catchments that are impacted both directly and indirectly by human activities. For European and alpine countries increased erosion has been reported over the last decades. Potential causes of increased erosion and sediment loads to rivers include global climate change with increased temperatures, altered precipitation patterns, changes in snow cover, seasonal snow melting and consequently discharge regimes. These may have led to increased river runoff, especially in winter and in spring, and altered seasonal and regional patterns of sediment input and clogging of river beds. A further cause of increased erosion and sediment loads in rivers are changes in land use and management, for example, changes in pasture management in uplands and changes in agricultural practices in lowlands.
Several methods have been developed to determine the amount of fine sediments in rivers: Turbidity measurements, suspended sediment sampler, bedload sampler and several types of sediment baskets to measure the deposition of fine sediment. But never have they been compared to each other.
We adopted multiple established methods to a smaller scale to measure the sediment input in a small, typical Swiss river (Enziwigger, Canton of Luzern) with a strongly modified morphology. These methods were used to study the temporal and spatial dynamics of fine sediments in three locations representing a high, medium and low fine-sediment load. Turbidity was measured continuously at all sites with optical backscatter sensor as well as 18 suspended sediment samplers, which were emptied weekly. The bedload was investigated with 18 bedload samplers and the fine sediment deposition was determined with 36 sediment baskets. Finally, flow stage in each location was monitored continuously.
First results of the spatial and temporal dynamics of fine sediments in the investigated river as well as the comparison of the different methods are presented.