Geophysical Research Abstracts
Vol. 21, EGU2019-18925, 2019
EGU General Assembly 2019

Influence of variations of rainfall and streamflow on river water turbidity dynamics in Lai Chi Wo catchment in Hong Kong, China

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Sediments transport is a common phenomenon in natural rivers, which directly drives change in turbidity. High turbidity caused by sediments transport in streams usually leads to water quality degradation and ecological problems. Bad water quality can make trouble in irrigating nearby farmlands and aquatic animals cannot tolerate in high turbidity environment. High turbidity condition occurs during rainfall events at most time. Thus, characterizing the features of turbidity changes versus rainfall and topographical patterns could shed light on the mechanism of turbidity changes, which can provide important information on catchment management. Therefore, the aim of this study is to investigate the turbidity changes as affected by rainfall events and terrain distinctions. Field experiments were conducted to monitor turbidity and water level with various terrain characteristics and different intensity of rainfall events at five locations of Lai Chi Wo catchment in Hong Kong, China. Turbidity sensors are installed in these five stations with values recorded every five minutes. At the same time, water level values can be obtained from corresponding sensors of all stations. We made the analysis of the strong rainfall events in rainy seasons during these two years. Preliminary results showed the fifteen minutes rainfall intensity correlated best with turbidity increasing rate in the downstream area of the catchment. It is related to the time for soils rushing into the river from upstream to downstream area. Solids settling phenomena was obviously observed in the downstream area where terrain is flat. That causes the station downstream farmlands area do not have high turbidity as expected. Mechanism behind the relationship between turbidity in river and rainfall intensity is affected by various factors. Our study is to reveal the mechanism from one aspect. Moreover, methodology adopted in the study can be applied into other conditions with turbidity changes to solve the local environmental problems.