Geophysical Research Abstracts,
Vol. 11, EGU2009-8946, 2009
EGU General Assembly 2009

A new approach to assess sediment impairment due to urban wet-weather discharges

L. Rossi (1), R. Fankhauser (2), and N. Chèvre (3)

(1) EPFL, ECOLOGICAL ENGINEERING LABORATORY, ENAC, Lausanne, Switzerland (luca.rossi@epfl.ch), (2) Fankhauser GEP Data Consulting, 4056 Basel (rolf.fankhauser@gepdata.ch), (3) IPTEH, Faculty of Earth Sciences and Environment, University of Lausanne, CH-1015 Lausanne, Switzerland (nathalie.chevre@unil.ch)

Sediment represents an important compartment of surface waters as it constitutes a habitat or spawning site for organisms. It may be impacted by anthropogenic activities, particularly through urban wet-weather discharges. In fact, during rain events a lot of particles accumulated on impervious areas and washed-off by rain (stormwater) or originating from wastewater (combined sewer overflows) end up in receiving waters. Numerous pollutants are attached to these particles (organic matter, heavy metals, polyaromatic hydrocarbons (PAHs), biocides, etc) and may generate adverse effects in the receiving waters. In this study, we propose an approach to estimate the risk of urban wet-weather discharge for sediments based on three assessment criteria: a) the clogging of the riverbed, b) the oxygen demand due to organic matter accumulation and c) the accumulation of contaminants on the riverbed (heavy metals, PAHs). These assessment criteria are defined in term of equivalent total suspended solids (TSS), a parameter classically measured in urban wet-weather discharge studies. We have implemented these criteria in a stochastic model in order to calculate TSS behaviour in receiving waters. The processes incorporated in the model are accumulation/sedimentation, transport and erosion of particles. In the stochastic approach, all parameters of the processes are randomly selected in a given distribution for each run (Monte-Carlo approach). As results, a probability curve is generated, giving the probability of exceeding the defined sediment criteria. Impact assessment of urban wet-weather discharges on riverbeds can thus be used as basis for planning efficient urban wet-weather protection measures. This approach, however, should be considered as a screening tool and in situ measurements should confirm the results.