

Interactive comment on “Long-term changes in sediment phosphorus below a rural effluent discharge” by B. E. Haggard and R. J. Stoner

Anonymous Referee #2

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This study is trying to assess the impact of P stripping at a WWTP on stream phosphate sediment dynamic downstream of the effluent.

This study has several general caveats which would need to be address before a more detailed review take place

First there is no control upstream of the WWTP either before or after the P stripping programme and unfortunately the hydrology of the two period was very different. This means that there is no guarantee that the relative decrease in EPC0 after P stripping is due to the treatment effect. The same decrease could have happened upstream of the WWTP effluent after P stripping due to changes in uptake/release kinetics of the fine sediment or increased biological activity under low flows.

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Second, in order to determine the EPC0, the sediment was allowed to equilibrate for only 1 hour (+ 20 min settling time). It takes however, generally, 24-48 hours to reach near equilibrium. (see e.g. the work done by W.A. House) and most studies have used 24 hours. This is biasing, potentially to a large extent, the absolute value of the EPC0. Could you supply the reader with kinetic studies of phosphate uptake/release from sediment and assess likely impact on your EPC0 measurements?

Finally in order to assess the driving factors (effluent TP concentration versus sediment release/uptake) you need to do a mass balance, i.e. quantify the phosphate flux released from the sediment compared to the water column phosphate flux.

There is presently no solid scientific evidence that (and I quote your last statement) "benthic sediments became the important factor likely regulating dissolved P concentrations in the stream water";.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 6, 767, 2009.

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