

[Assessing channel response of a long river influenced by human disturbance \(Latapie et al 2014\) \[1\]](#)

This paper describes an approach to assess channel changes of a long anthropogenised river (the Middle Loire River) over decadal timescales. Channel changes are evaluated along geomorphically homogeneous river reaches. The classic geomorphic parameters (active channel width, bed slope, grain size) are complemented with parameters extracted from a 1D hydraulic model: width-depth ratio, effective bed shear stress and specific stream power calculated for the biennial discharge assimilated to bankfull flow conditions.

The delineation of reaches is undertaken by combining visual inspection with the implementation of simple statistical tests to corroborate discontinuities in flow and sediment transport. The 450 km long study area has been divided into 167 homogeneous reaches. The general trends observed over the last fifty years are narrowing of the active channel width and incision of the river bed. However, changes in bed level and active channel width are not consistently correlated. Channel changes at the reach scale are mainly controlled by the presence of former sediment extraction sites. Significant incision is observed at the peak of the in-stream sediment mining period. This was followed by channel recovery when extractions stopped. The 1D numerical model provides a more rigorous manner to derive hydraulic parameters. The effective bed shear stress made dimensionless by its critical value and the width-depth ratio helps to explain observed channel responses more effectively by relating patterns to geological units along the Middle Loire.

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