



Lorrison GOND (2018-2022)

Determination of transverse mixing coefficients in a shallow water wandering gravel-bed river : application to the Durance River.

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Transverse mixing coefficients are key to predicting the efficiency of pollutant dispersion in rivers. While most studies deal with relatively homogenous river reaches, the literature review indicates that shallow, gravel-bedded rivers with longitudinally-varied bed, such as the Durance river, are still poorly documented. The overall transverse mixing coefficient of a reach with varied hydraulic parameters could be estimated as a combination of the coefficients of more homogeneous sub-reaches.

With many geometric and hydraulic parameters that can affect the transverse mixing in river, such as roughness and macro-roughness/emergent blocks or vegetation, aspect ratio, discharge, meanders, etc, it is an invitation to rank the impact of those parameters in order to represent best the mixing in river through a simplified model. Complementary approaches are to be applied:

1. A field study, involving tracer injection and concentration measurements, with help from Irstea Lyon-Villeurbanne ;
2. A laboratory study, to try to reproduced the hydraulic configurations observed on the field, in the hydraulic canal of LMFA INSA de Lyon ;
3. An analysis of correlations between the transverse mixing coefficients and hydraulic parameters
4. A 2D modelling of the mixing of a rejection of pollutant in the Durance river

Mixing coefficient thus determined will allow the determination of mixing length downstream an industrial water waste disposal area in the rivers.



Tracer injection in the Durance River, La Saulce (25/09/2019)