



Dynamic of dissolved and particulate elements during flood events in a large intensive agricultural catchment

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Pollutants (including nitrates and pesticides) may be transported from agricultural catchments to stream networks either in the soluble phase or in the particulate phase according to their solubility. Intensive agriculture like sunflower growing demands high amounts of fertilizers and pesticides. The most important exportation of these contaminants occurs during flood events. This study – included in the Aguaflood (<http://www.aguaflood-sudoe.eu/>) European project – aims to understand contaminants loads dynamics in both soluble and particulate phases into rivers. The temporal transport of nitrate, chloride, suspended sediment and pesticides were investigated during one year from June 2009 to June 2010 within a large agricultural catchment in southwest of France (Save catchment, 1110 km²). This study was based on an extensive dataset with high temporal resolution using manual and automatic sampling, especially during flood events. Two main objectives aimed at: (i) studying temporal transport of nitrate, chloride, suspended sediment and pesticides with factors explaining their dynamics and (ii) analysing the relationships between discharge, nitrate, chloride, suspended sediment and pesticides during flood events. The relationships of nitrate, chloride, suspended sediment and pesticides versus discharge over temporal flood events resulted in different hysteresis patterns which were used to suggest those dissolved and particulate origins. Pesticides with a high solubility ($K_{ow} < 3$) have the same pattern than nitrate and chloride and are transported in dissolved phase. The pesticides with a low solubility ($K_{ow} > 3$) have the same pattern than suspended sediments and are sorbed in the particulate phase. A conceptual model was proposed to explain pesticide transport in a large intensive agricultural catchment.