

Focus on physicochemical parameters and nutrient dynamics in a little peri-urban river, using different frequency monitoring (northern France)

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The Marque River is a small river located in Northern France in a peri-urban watershed, going through both agricultural and urban areas. A multi scale monitoring frequency has been undertaken in order to understand the aquatic ecosystem dynamic.

Indeed, two types of monitoring (low and high frequencies) were applied to assess the quality of this river impacted by multi-origin inputs. The low frequency monitoring consisted in monthly or bi-monthly historical data from 2007 to 2012, and monthly grab samplings carried out from February 2014 to February 2015 focused on physicochemical parameters and nutrients. Additionally, a high frequency monitoring was implemented twice a year at two different seasons (summer 2014 and from spring to summer 2015) in the river. Physicochemical parameters (oxygen, temperature, conductivity, pH, solid particle matter, dissolved organic carbon) and nutrients (NO_3^- , NH_4^+ and PO_4^{3-}) were recorded every 10 minutes. Furthermore, both the river flow and the pluviometry were recorded at the scale of the day.

This presentation is going to demonstrate that (i) considering nutrients, a multi-origin pressure (agricultural and urban) impacts the stream and leads to its ecological degradation by comparison with the concentrations limits suggested by the Water Framework Directive; (ii) photosynthesis/respiration cycles are affected by intense inputs of organic matter and nutrients especially during heavy rain events that can also cause anoxic events; (iii) the effects of the urban inputs are more pronounced during the dry periods as exhibited for example by the increase of the river flow during the day; (iv) the phosphate concentrations seem to be related to the dissolved oxygen contents and (v) strong nutrients concentrations stimulate eutrophication. Overall, our findings clearly highlight the importance of high frequency monitoring in order to better understand the dynamic behavior of water courses.