

## **Sediment concentration – water discharge hysteresis during runoff events in Norwegian agricultural rivers**

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Reduced sediment losses from agricultural areas is a priority in Norway, mainly because of the associated transport of pollutants such as phosphorous or pesticides. At the same time, it is shown that a large proportion of the annual total runoff and soil loss often occurs during relatively short episodes. Understanding the dynamics of short-term events is therefore important in order to estimate sediment and pollutant losses, and to assess pollutant sources. Suspended sediment concentrations are often closely related to water discharge, but this relationship is seldom unequivocal and can vary by several orders of magnitude due to such factors as hysteresis, seasonality, and antecedent flow episodes (e.g., decrease of sediment availability in multi-peaked events).

The aim of this research was to quantify seasonal differences in sediment concentration – water discharge hysteresis during runoff events in two agricultural catchments in Norway with different scales (5 km<sup>2</sup> and 300 km<sup>2</sup>). Hourly records of turbidity (SEBA Hydrometric turbidity sensors) that correlated well with suspended sediment concentration, and hourly water discharge records were used in the analysis. Events were classified according to the Hysteresis Index (HI) developed by Lawler et al, (2006 *Sci. Total Environ.* 360:109-126). The HI was correlated with parameters such as precipitation, sediment transport, season, and previous water discharge events. The results indicate differences in the HI across scales and between seasons. Seasonality can be explained by variations in land use and climate; while differences between catchments can be attributed to scale and dominant sediment pathways.