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New insights from high-resolution phosphorus monitoring

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Managing eutrophication in water-bodies requires understanding and quantification of nutrient transfers from surrounding watersheds. Monitoring phosphorus (P) transfers in rivers is constrained, however, by the need to analyse samples in the laboratory. This results in coarse datasets that are difficult to interpret, and the use of statistical methods to extrapolate annual loads, which are largely underestimated. The use of in-situ, continuous monitoring equipment has long been recognised as the most robust way of providing understanding of catchment processes in rivers by providing high resolution data that can also be used for model validation purposes. We present data from continuous TP/TRP analysers that collect, process and log water chemistry data on a 10minute time-step in rural streams in the Irish border region (according to an accredited analytical method). This chemistry data collection is synchronous with high resolution hydrometeorological data and so all major phases of climatic and hydrological conditions are captured. Time series data from three stations have >95% coverage since 2005 and indicate periods of storm related diffuse P transfers, elevated and diurnal signals of ambient, non-storm P transfers and singular pollution episodes. The data provide the most complete record of annual P transfers in rivers with which to compare year-on-year changes and also to test catchment model outputs and the confidence of coarser sampling regimes.