



Long-term low-frequency or short-term high-frequency monitoring: are both necessary?

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This paper describes the patterns observed in a high-frequency (7-hourly) streamwater chemistry data set obtained for the Plynlimon Catchment, Wales from 2007-2009. Plynlimon is an upland site underlain by lower Palaeozoic mudstones, greywackes and sandstones that are overlain by thin acidic soils comprised mainly of stagnopodzols and peats. Vegetation cover is dominated by acid grassland (*Nardus-Festuca*) and heath land with plantation forestry in the lower parts of the catchment (mainly Sitka spruce *Picea sitchensis*). The site has a long history of environmental monitoring which started in earnest in the early 1980s and continues to the present day to look at the issues of evapotranspiration from coniferous forest and the impacts of clear felling and acid deposition on soil and streamwater quality. The new dataset is explored using time-series analysis and this talk will focus on a sub-set of determinants including pH, aluminium, chloride, nitrate, calcium, sulphate, silicon, DOC, iron and conductivity. The results are compared with a longer-term (1983-2010) hydrochemical dataset from the same study area which was sampled at lower frequency (weekly). This comparison provides an opportunity to assess the value and information content of both long-term, low frequency and short-term, high-frequency datasets. The results will be discussed in terms of the catchment hydrological and hydrochemical processes operating at different spatial and temporal scales. The discussion will also focus on the information content of high-frequency water quality data versus the cost of collection.