



Implications of temporal variability for uncertainty in spatial interpretations of stream geochemistry data

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Stream water is a key medium for regional geochemical survey. Stream water geochemical data have many potential applications, including mineral exploration, environmental monitoring and protection, catchment management and modelling potential impacts of climate or land use changes. However, stream waters are transient, and measurements are susceptible to various sources of temporal variation. In a regional geochemical survey stream water data comprise "snapshots" of the state of the medium at a sample time. For this reason the British Geological Survey (BGS) has included monitoring streams in its regional geochemical baseline surveys (GBASE) at which daily stream water samples are collected to supplement the spatial data collected in once-off sampling events.

In this study we present results from spatio-temporal analysis of spatial stream water surveys and the associated monitoring stream data. We show how the interpretation of the temporal variability as a source of uncertainty depends on how the spatial data are interpreted (as estimates of a summer-time mean concentration, or as point measurements), and explore the implications of this uncertainty in the interpretation of stream water data in a regulatory context.