Geophysical Research Abstracts
Vol. 15, EGU2013-1429, 2013
EGU General Assembly 2013

The use of very long term water quality records from the UK: new insights and new methods

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In densely populated, developed countries there is continuing pressure on water resources and on maintaining adequate water quality. Many developed countries have established water quality monitoring networks and private companies have conducted water quality monitoring for a range of reasons, including: process optimisation; safeguarding habitats or enforcing legislation. For many sites water quality monitoring has gone on for several decades and now represents an invaluable resource against which we can test a range of hypothesis, hypotheses often unrelated to the original purpose of the monitoring. Furthermore, considerable datasets have now been amassed which means that we can learn from long runs of data to better process and understand the current data. In this presentation we will outline a range of research projects where long records have proven invaluable.
i) Long term records of nitrate from several sites across the UK have been used to assess whether the UK programme of nitrate vulnerable zones has been successful;
ii) Long term records of DOC have been used to test hypotheses of why DOC concentration in rivers of the northern hemisphere are rising; and
iii) A long term record of nitrate can be used to assess the importance of competing environmental drivers such as land-use and climate change.
These long records enable us to advance new methods of calculating solute flux. Large datasets also mean we can process data to examine underlying signals in the data providing for new biogeochemical and hydrological conclusions.