

Investigating Organo-Mineral Suspended Sediment Controls on Catchment Phosphorus Export

Richard Cooper and Barry Rawlins

Research objectives

To develop a reliable, non-destructive, and cost-effective method of analysing how the organo-mineral chemistry of suspended sediments controls phosphorus export from the Blackwater sub-catchment during and between storm events of differing intensity and following agricultural practices.

Key messages

- Two spectrometers - XRF and FT-IR, have been calibrated to predict the organo-mineral chemistry of suspended sediments trapped on filter papers.
- The importance of field drains and road runoff to total phosphorus flux will be measured, alongside a temporal assessment of storm event dynamics.

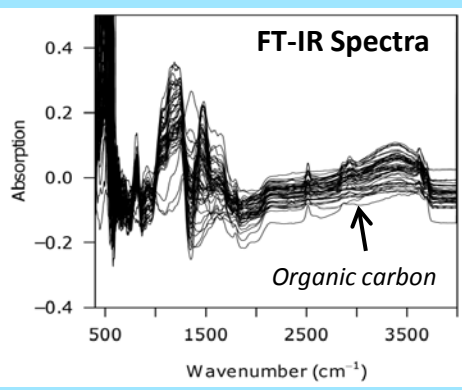
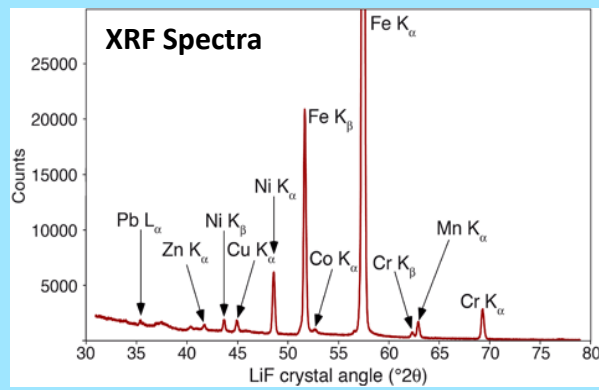
Contact: Richard.J.Cooper@uea.ac.uk

Description of research/methods

The Blackwater sub-catchment of the Wensum is characterised by high levels of suspended sediments which act as a major vector for the transport of phosphorus through the catchment, and in turn play a key role in controlling the development of eutrophic conditions and the rate of primary productivity. Phosphorus is transported in association with organic matter and iron and aluminium oxyhydroxides, and here a novel application of two spectroscopic techniques is used to define how the chemistry of suspended sediments temporally controls phosphorus flux:



1. **X-ray fluorescence (XRF)** used to determine sediment elemental composition;
2. **Fourier Transform infrared spectroscopy (FT-IR)** used to determine the organic carbon and Fe/Al oxyhydroxide concentrations.



Sediments are collected on filter papers during weekly baseline grab sampling at monitoring mini-catchment sites A, B, and E, as well as by ISCO automatic sampling during storm events, and fortnightly sampling of field drains and road runoff.

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