



Identifying fine sediment sources to alleviate flood risk caused by fine sediments through catchment connectivity analysis

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Fine sediment poses a significant threat to UK river systems in terms of vegetation, aquatic habitats and morphology. Deposition of fine sediment onto the river bed reduces channel capacity resulting in decreased volume to contain high flow events. Once the in channel problem has been identified managers are under pressure to sustainably mitigate flood risk. With climate change and land use adaptations increasing future pressures on river catchments it is important to consider the connectivity of fine sediment throughout the river catchment and its influence on channel capacity, particularly in systems experiencing long term aggradation.

Fine sediment erosion is a continuing concern in the River Eye, Leicestershire. The predominately rural catchment has a history of flooding within the town of Melton Mowbray. Fine sediment from agricultural fields has been identified as a major contributor of sediment delivery into the channel. Current mitigation measures are not sustainable or successful in preventing the continuum of sediment throughout the catchment. Identifying the potential sources and connections of fine sediment would provide insight into targeted catchment management.

'Sensitive Catchment Integrated Modelling Analysis Platforms' (SCIMAP) is a tool often used by UK catchment managers to identify potential sources and routes of sediment within a catchment. SCIMAP is a risk based model that combines hydrological (rainfall) and geomorphic controls (slope, land cover) to identify the risk of fine sediment being transported from source into the channel. A desktop version of SCIMAP was run for the River Eye at a catchment scale using 5m terrain, rainfall and land cover data. A series of SCIMAP model runs were conducted changing individual parameters to determine the sensitivity of the model. Climate Change prediction data for the catchment was used to identify potential areas of future connectivity and erosion risk for catchment managers. The results have been subjected to field validation as part of a wider research project which provides an indication of the robustness of widespread models as effective management tools.