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Sediment dynamics in the River Tees during the year 2000 floods

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An estuarine barrage was constructed across the mouth of the River Tees in northern England in the 1990's. In order to investigate the long-term functioning of the barrage impoundment a detailed monitoring and modelling study was set up. This paper reports on sediment dynamics at the pre-impoundment tidal limit of the river Tees. 15-minute turbidity data were collected at the Environment Agency flow gauging station at Low Moor, over a period of more than 3.5 years which preceded, included and continued after the major flood events in winter 2000. The turbidity data were augmented by automatic pumped-sampling during high flow events, with samples being analysed for sediment concentration. These concentration data were the used to calibrate the turbidity sensor allowing a long-term 15-minute sediment concentration data set to be established. Concurrent river flow data allowed sediment loads to be estimated. This detailed data set offers interesting insights into sediment behaviour. In this paper various aspects of the sediment data will be discussed, including changes in sediment dynamics during the flood events, an analysis of how sediment moves over the flow exceedance range, implications for the barrage impoundment and likely effects of climate change.