



## The impact of blocking natural peat pipes on dissolved organic carbon

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Natural pipes transport water and aquatic carbon through peatlands. In 2010 pipes were blocked on Keighley Moor in northern England as part of a peatland restoration programme aimed at reducing water discolouration and dissolved organic carbon (DOC) release into stream waters used for potable water supply. Blocked and open pipes were monitored for water quality between June 2012 and October 2013. The DOC, water colour, conductivity and pH were not significantly different between open pipes and water flowing from areas where pipe blocking had occurred. A before-after control-treatment experiment was devised at another peatland site - Moor House World Biosphere Reserve in northern England. Here, the areas around six pipes were monitored for water quality, discharge, water tables, and overland flow. Four of the pipes were then blocked while monitoring continued on all six pipes. The Moor House investigation suggests that the overall effects of blocking on water colour and DOC in the following summer were small (5 % decrease in absorbance at 254 nm but 7 % increase in absorbance at 400 nm, and 2 % decrease in DOC relative to open pipe controls). There were large (40-117 %) local increases in colour and DOC in overland flow but decreases in soil water (7-10 %) relative to the areas around open pipes. Water tables rose by a few cm upslope of the pipe dams. However, downslope, water tables fell by a similar amount, thereby potentially counteracting any water quality benefits resulting from shallower water tables upslope. Pipe blocking is expensive, and our results to date suggest that any water quality benefits are outweighed by the cost of blocking. However, in highly-degraded sites where pipes are rapidly expanding to form gullies, pipe blocking may be useful as part of a larger suite of measures to help reduce peat erosion.