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Quantification of fluvial-peat interactions in the Pikeville formation Central Appalachian Basin, USA.

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Basin-scale fluvial architecture is, to a large extent, determined by the ability of river systems to migrate and avulse across their own floodplain. River avulsion takes place when a river aggrades by one channel depth to achieve super-elevation above the surrounding floodplain. However, peat enhancement of floodplain aggradation is likely to affect this fluvial behaviour and has received little attention. The interaction between river channels and peat-dominated floodplains is likely to have the effect of inhibiting or prolonging the conditions required for river avulsion, and so will impact on basin scale architecture during prolonged peat accumulation on floodplains. To elucidate and quantify the nature of this channel-floodplain interaction we investigate the coal-bearing clastic interval of the Carboniferous Pikeville Formation, Central Appalachian Basin, USA. Using a combination of well data and outcrop data, two coal horizons and intervening sand bodies, were mapped across an area of 5700 km^2 to ascertain overall basin-scale architecture. Comparison of the accumulation rate of the coal units (corrected for decompaction) with the synchronously deposited sand bodies suggests that extensive and rapid peat accumulation can increase avulsion timescales by 3 orders of magnitude and dramatically alter basin-scale fluvial architecture.