Supporting Information

Table S1 Charge balance and solution ionic strengths (μeq L^{-1}) for ECN soil waters after model speciation of a full range of chemistry including charge on the DOC. Values shown are means (±1 standard deviation) of 1993-2007 data. 'nd' denotes not determined due to a lack of measurement of reduced S and N species in the anoxic deep peat.

	Glensaugh	Sourhope	Moor House
Charge balance			
Shallow soil solution	32 (±48)	48 (±46)	1.8 (±2.4)
Deep soil solution	10 (±26)	40 (±37)	nd
Ionic strength			
Shallow soil solution	407 (±103)	448 (±218)	159 (±94)
Deep soil solution	443 (±99)	487 (±191)	184 (±48)

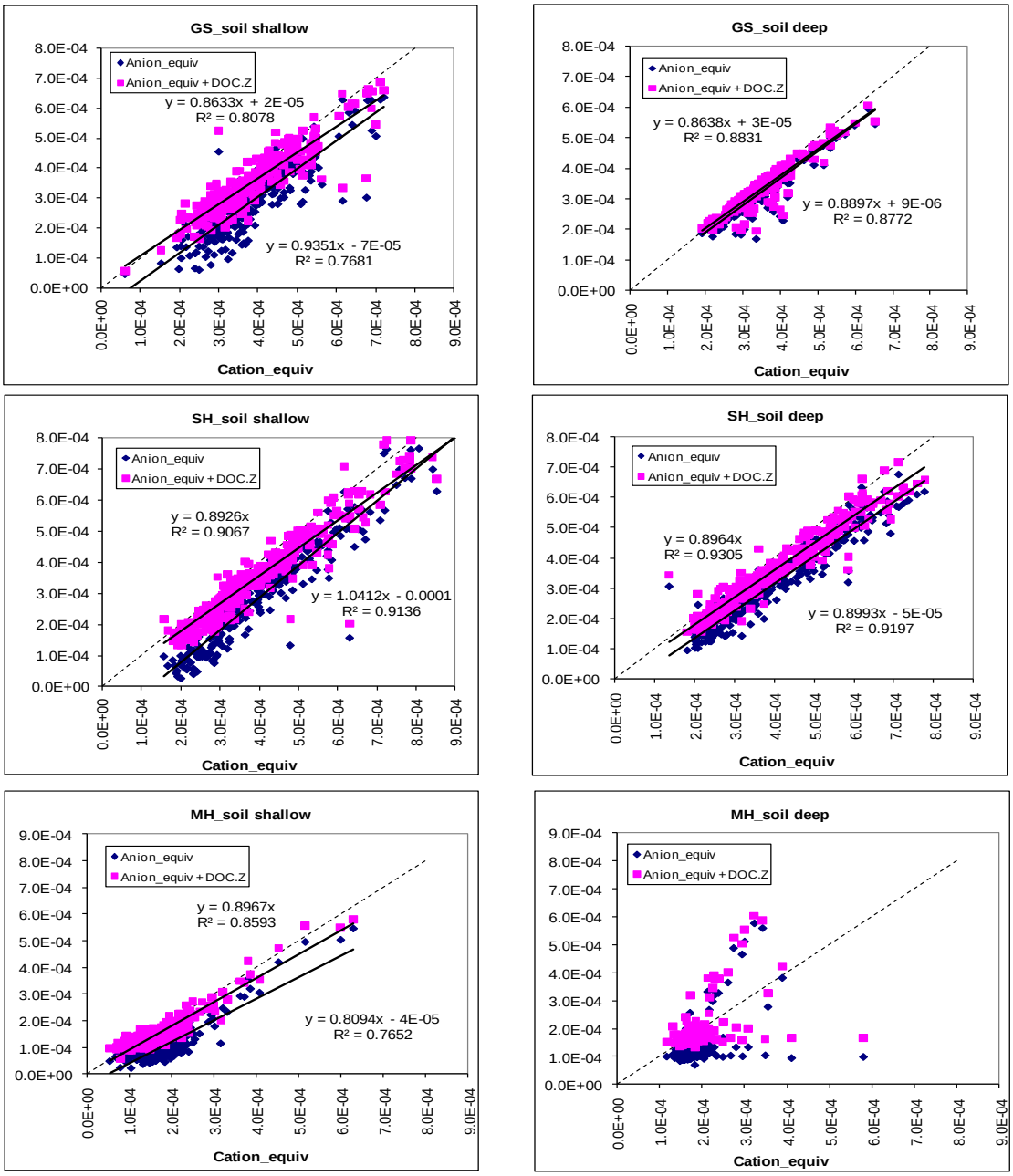

Figure S1**.** Details of charge balances attained following geochemical modelling of soil solution chemical species using NICA-Donnan. Each plot shows the charge balance of cations (*x* axis) *vs* on the *y* axis either inorganic anions (in blue) or anions+DOC.Z (in purple). The good balance attained for GS, SH and MH (for the latter shallow soil only) can be seen as agreement to the 1:1 line (dashed line) when anions+DOC.Z is used. However, for MH deep the inability can be seen in attaining charge balance due to undetermined chemical components (reduced S and N species) in this deep, often anoxic peat layer.