



Understanding multiple element budgets of peatlands – a role for simple stoichiometry?

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A few studies have considered the carbon budget of peatlands; fewer studies have considered the N budget of peat soils. None have considered both together, and furthermore, it is possible to include the oxygen and the energy budgets. By including a range of types of flux the study can not only comment on the overall stoichiometry of the ecosystem but also its oxidation state and thus assess the total impact on the atmosphere and likely direction of change in response to ongoing climate change. This study has shown: 1. Over the 13-year study period, the total carbon balance varied between a net sink of -20 to -91 tonnes C / km² / yr. 2. Overall, the total N budget of the peat ecosystem varies from -1.0 to +2.5 tonnes N/km²/yr, i.e. in some years the ecosystem is a net source of N. 3. Oxidation state (Cox) decreases through the profile with DOC and POC fluxes acting as additional means of removing oxidised carbon. 4. The energy budget shows a long-term decline in evaporation for a catchment that is independent of changes in air temperature or net radiation. Changes in net radiation are accommodated by increases in sensible heat flux and concomitant changes in the Bowen ratio. 5. The results suggest that the catchment is responding to change by limiting evaporation and this suggests the system is near equilibrium and not a far-from equilibrium system. By combining elemental and energy budgets it is possible to write stoichiometric equations for the ecosystem and assess its efficiency and future direction under ongoing change.