

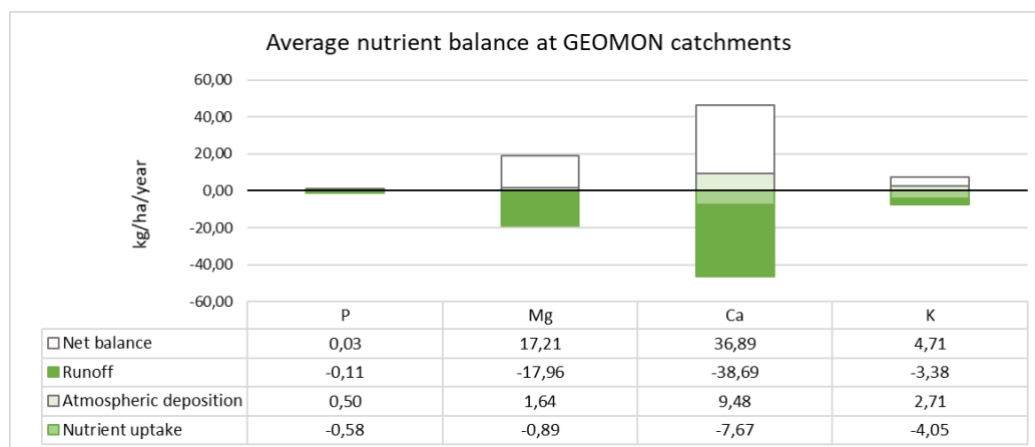
The mass balance of base cations (Mg, Ca and K) and P at 14 small catchments, Czech Republic

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The mass balance of base cations (Mg, Ca and K) and P was assessed in the 14 long-term monitored GEOMON catchments in the Czech Republic (Oulehle et al., 2017). Measured fluxes of atmospheric deposition (average deposition for years 1994 - 2019), streamwater runoff (average for years 1994 - 2019) (Oulehle et al., 2021) and estimated annual uptake of nutrients by forest biomass were compared among the catchments and the net balance was calculated. The net balance was compared with pools of nutrients in the forest-soil profile down to 80 cm (extraction with BaCl₂).

Results show that runoff and uptake of studied nutrients significantly exceed atmospheric deposition. Base cations in catchments were therefore mainly supplied from rock weathering and soil sorption complex. Based on the mass balance approach, the mean soil supply accounted for 17 kg/ha/yr for Mg, 37 kg/ha/yr for Ca, 4.7 for K and 0.03 kg/ha/yr for P. The phosphorus balance is close to zero in all monitored catchments, with the exception of the LYS and MOD catchments, where there is higher soil supply demand for P (0.45 kg/ha/yr for LYS and 0.54 kg/ha/yr for MOD).

The highest soil supply demand was recorded for calcium of all studied elements. The highest required soil supply of Ca was observed at JEZ (67 kg/ha/yr) and at CER (63 kg/ha/yr). Extremely high soil supply demand of Mg is at PLB catchment with serpentinite as prevailing bedrock (81 kg/ha/yr). The second highest soil supply demand of Mg was detected at CER (27 kg/ha/yr). The highest soil supply demand of K is calculated at extremely acidic LYS catchment (13 kg/ha/yr).



Literature

Oulehle, F., Chuman, T., Hruška, J., Krám, P., McDowell, W. H., Myška, O., Navrátil, T., Tesař, M. (2017): Recovery from acidification alters concentrations and fluxes of solutes from Czech catchments. *Biogeochemistry*, 132, 251 – 272

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