

## Abstract

The main aim of this thesis was analysing the data from 1994 – 2013 time period on chosen Czech catchments of monitoring network GEOMON (Jezeří and Na Lizu). These data sets were compared to data from Norwegian catchment Birkenes (1994 -2012). Chemical database of runoff on these catchments was divided into two groups – period of groundwater runoff and period of hydrological events. The assumption of the highest ANC during the period of groundwater runoff was fulfilled on the studied catchments. In the case of catchments Na Lizu and Birkenes the stable group of values of  $H^+$  concentrations, which was due to a dominant subsidizing of streamflow with groundwater with higher ANC, was found out. Regardless the distinct order of values of monthly atmospheric depositions of  $S - SO_4^{2-}$  on Czech catchments, results of Mann – Kendall test showed steep decrease in 90s in bulk deposition. Currently, the values of deposition  $S - SO_4^{2-}$  on Jezeří catchment reaches the same values as the deposition on Na Lizu catchment in 90s of 20th century. In the first decade of the monitoring period (1994 – 2003) values of  $N - NH_4^+$  and  $N - NO_3^-$  deposition showed moderate growth in throughfall. This growth was not confirmed during the next time period (2004 – 2013). The bedrock of catchments Na Lizu and Jezeří is formed by gneisses. Catchment Na Lizu, where the chemical composition of runoff over the past 20 years remained broadly unchanged, is characterized by the highest ANC during the period of groundwater runoff. There were recorded twice as higher concentrations of cations on the catchment Jezeří then Na Lizu, although over the past 20 years there was a very steep decline. Currently, the chemical composition of the groundwater in Czech catchments is influenced by washing of sulphate supplies accumulated during the time of acid deposition from soil layers. ANC values in Birkenes catchment during groundwater runoff have the greatest variance and often become negative. Low concentrations of cations in runoff in the catchment Birkenes are mainly due to the low intensity of weathering of granite bedrock with lower frequency of fissures. The declining trend of sulphates in the runoff is caused with a certain time shift by declining trend of anions contained in throughfall.

