



The monitoring network GEOMON - 10 years of data

DANIELA FOTTOVÁ, TOMÁŠ NAVRÁTIL, PAVEL KRÁM

Czech Geological Survey, Prague

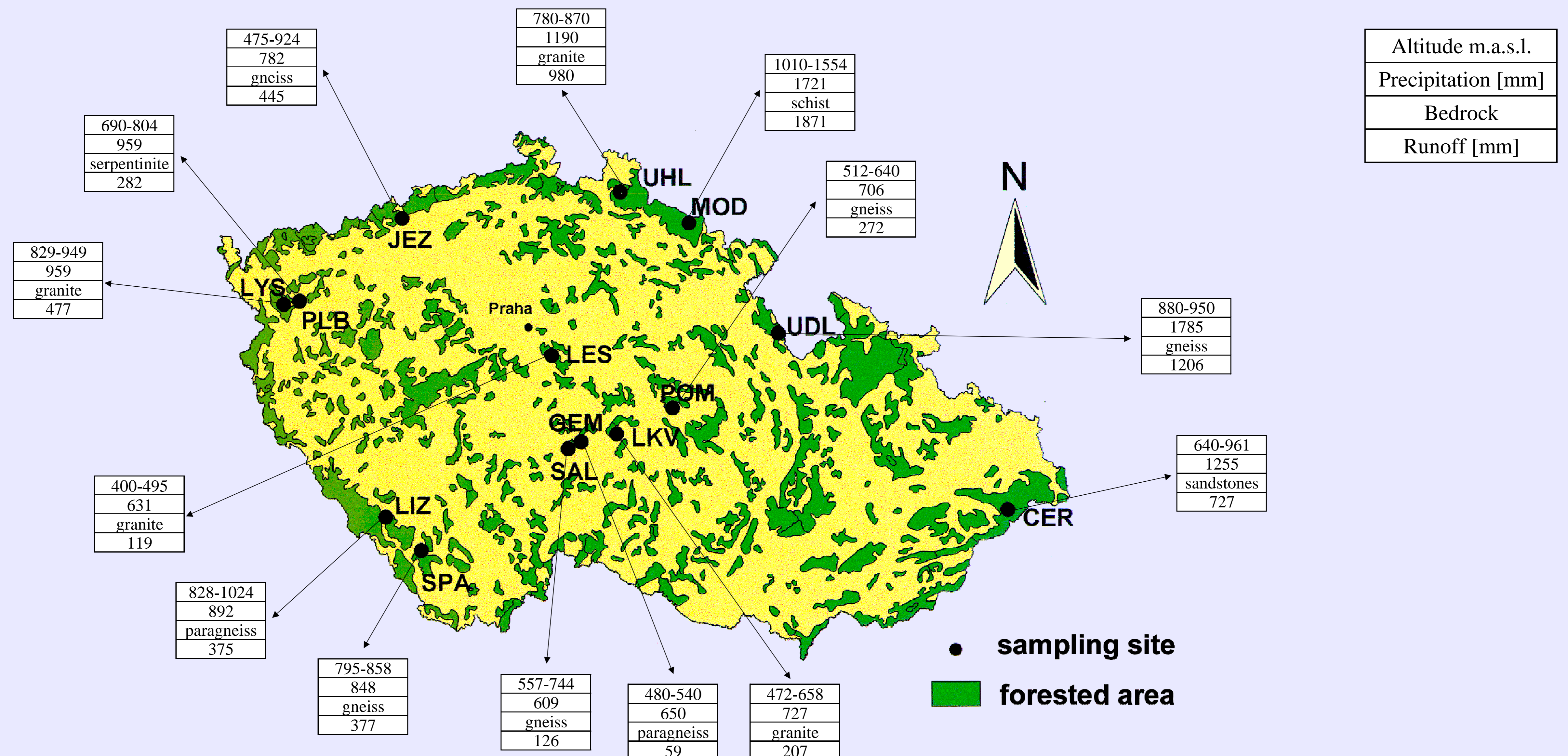
Introduction

The GEOMON monitoring network was established in 1994 and has been maintained by the Czech Geological Survey.

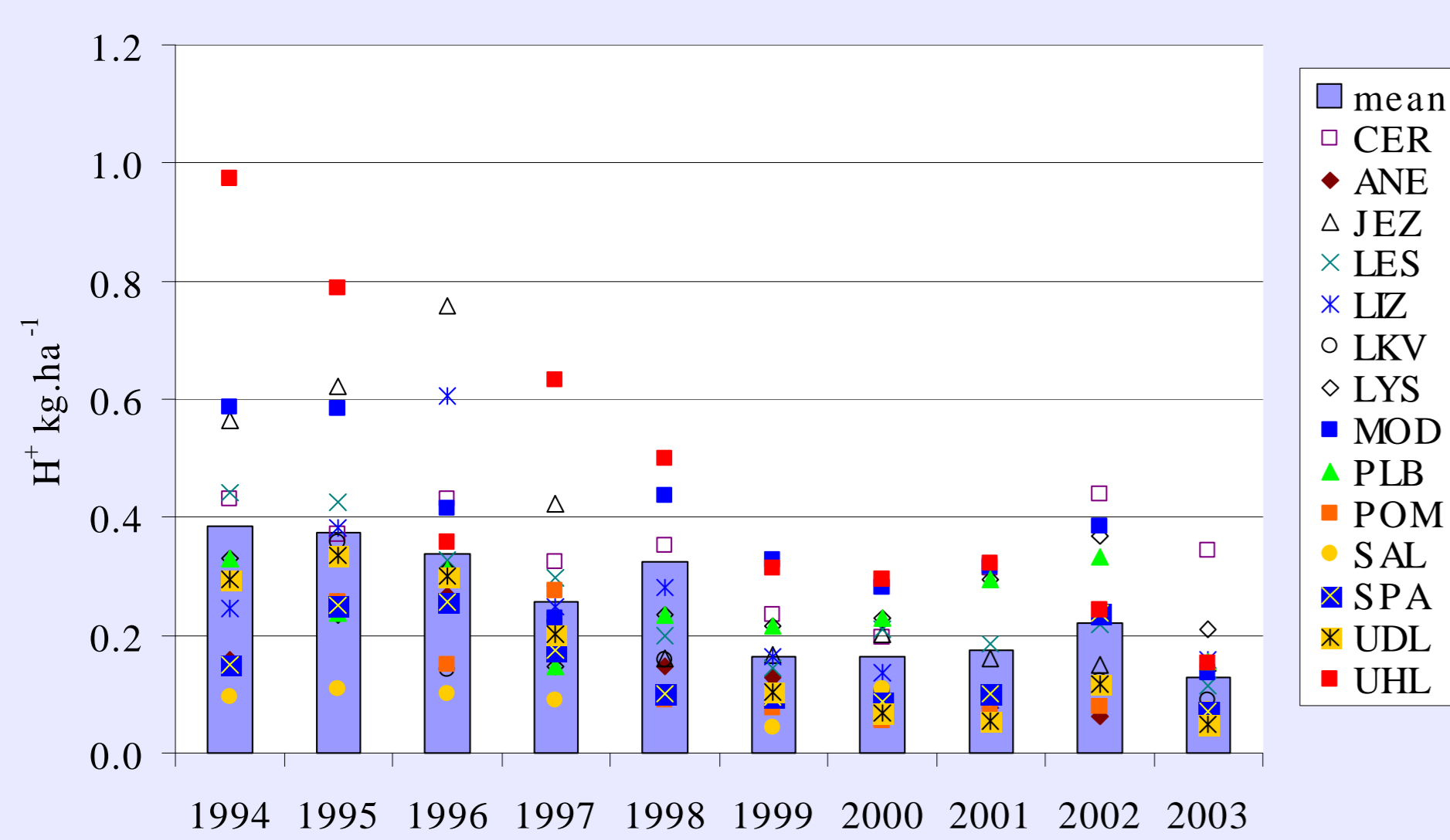
The network includes 14 monitoring sites distributed within forested areas of the Czech Republic.

Site description & Sampling methods

Bulk precipitation, throughfall and streamwater output fluxes from all the sites were monitored in monthly time step. All sampled solutes were analyzed for concentrations of main cations (Na, K, Mg, Ca and NH_4), main anions (F, Cl, NO_3 and SO_4) and selected trace metals (Mn, Al, Fe, Pb, Cu, Cd and Zn).



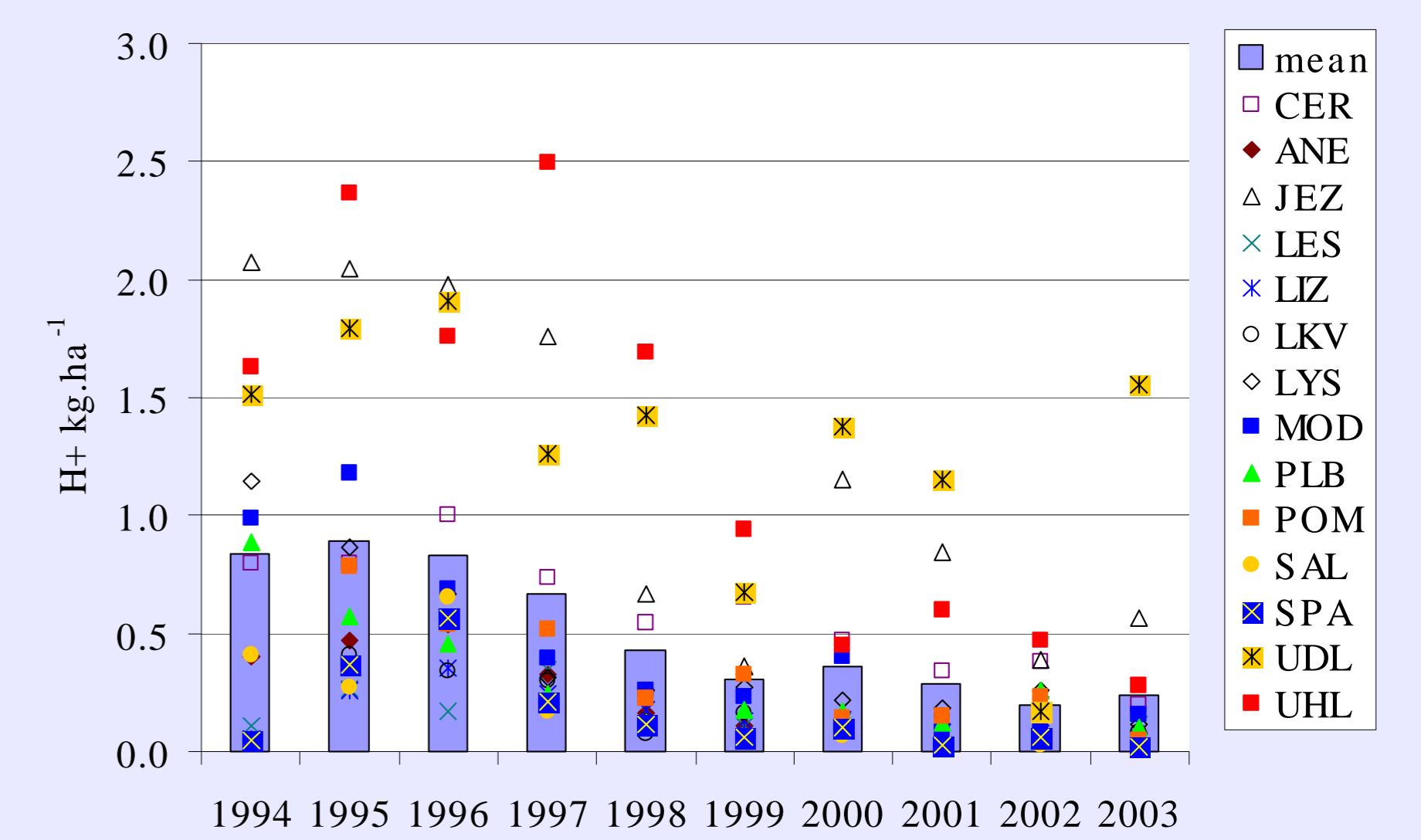
Bulk precipitation



The monitoring period 1994 - 2003 covered important changes in the Czech environmental policy. The desulfurization of the main coal power stations was started in 1993 and completed in 1999.

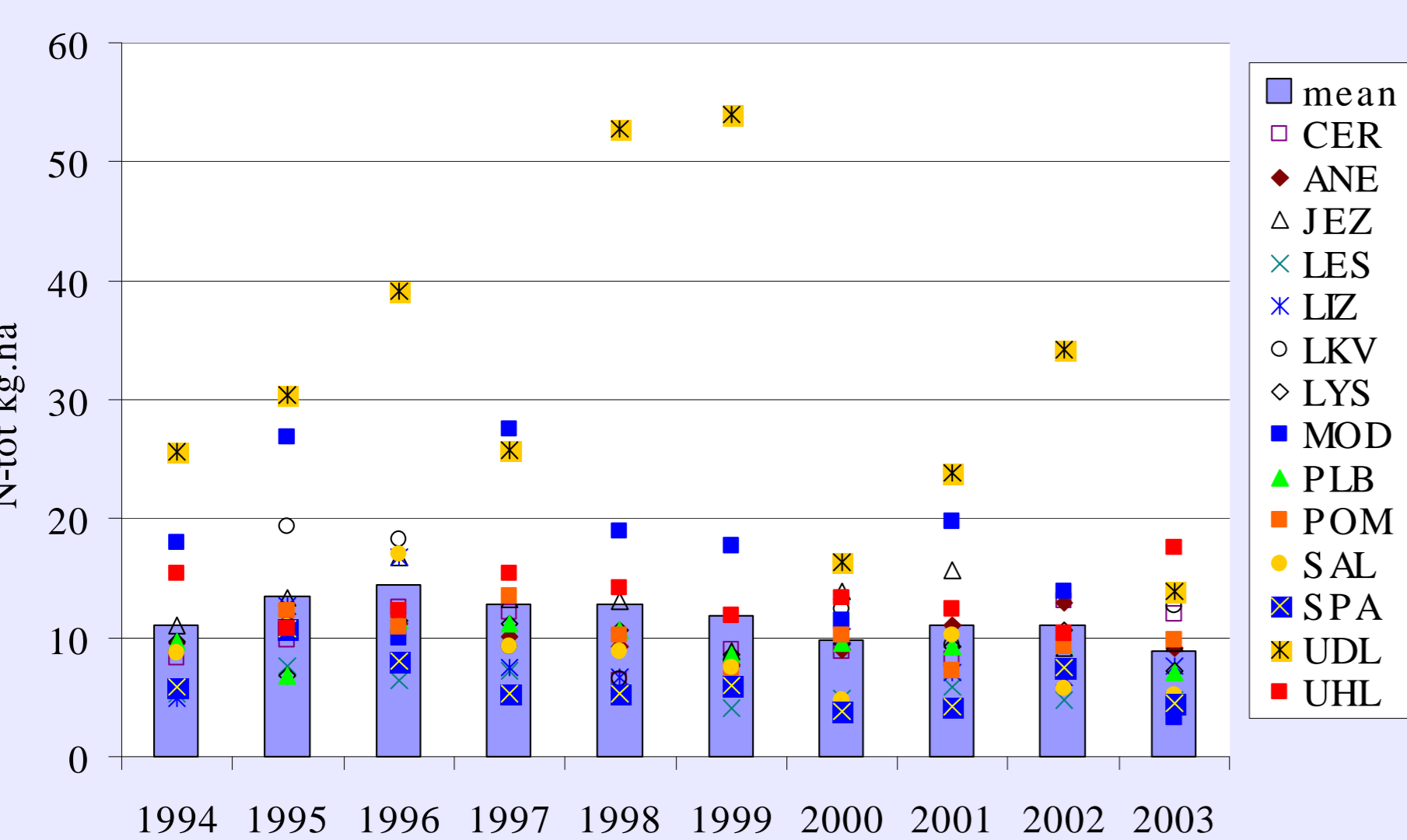
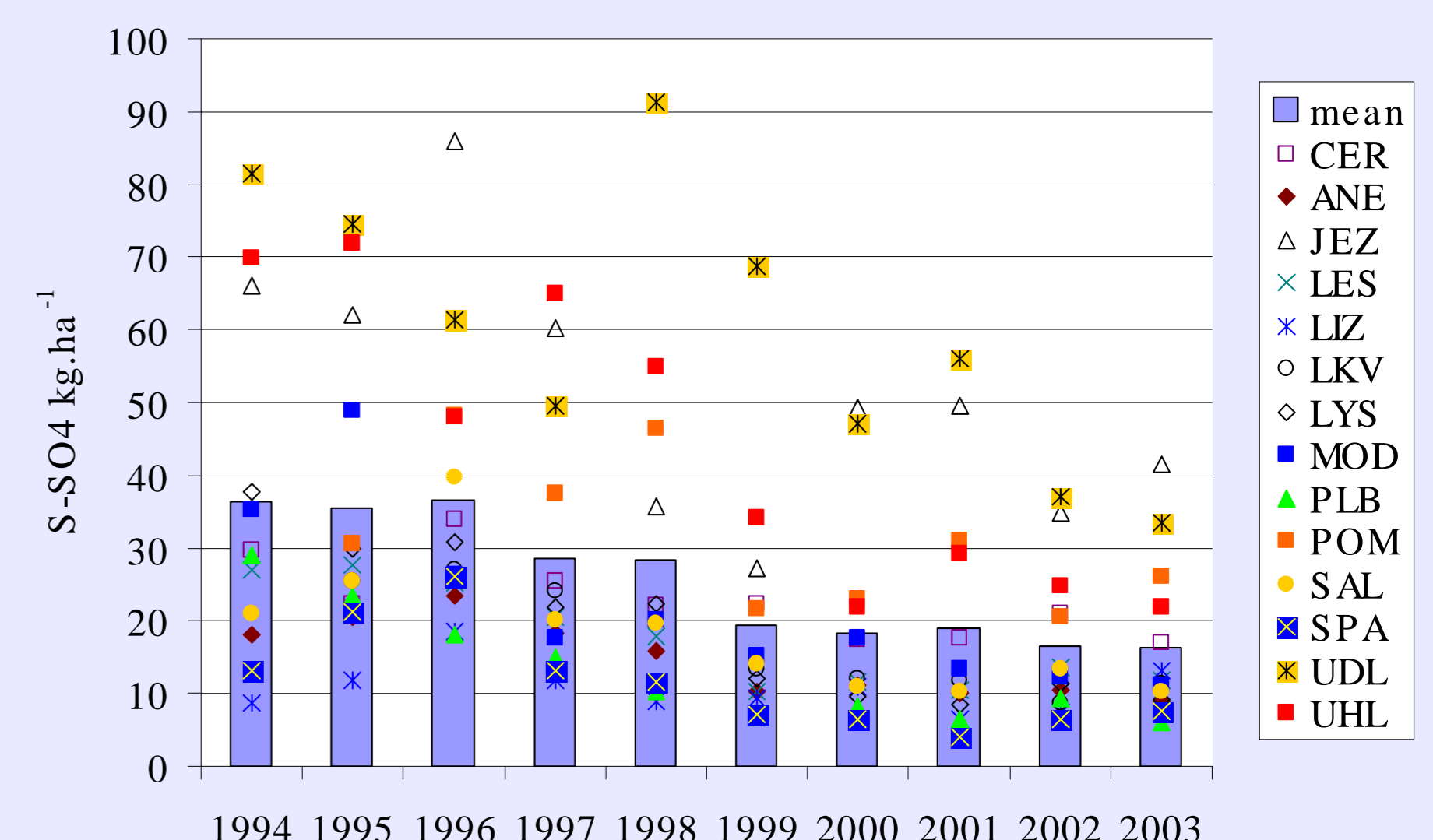
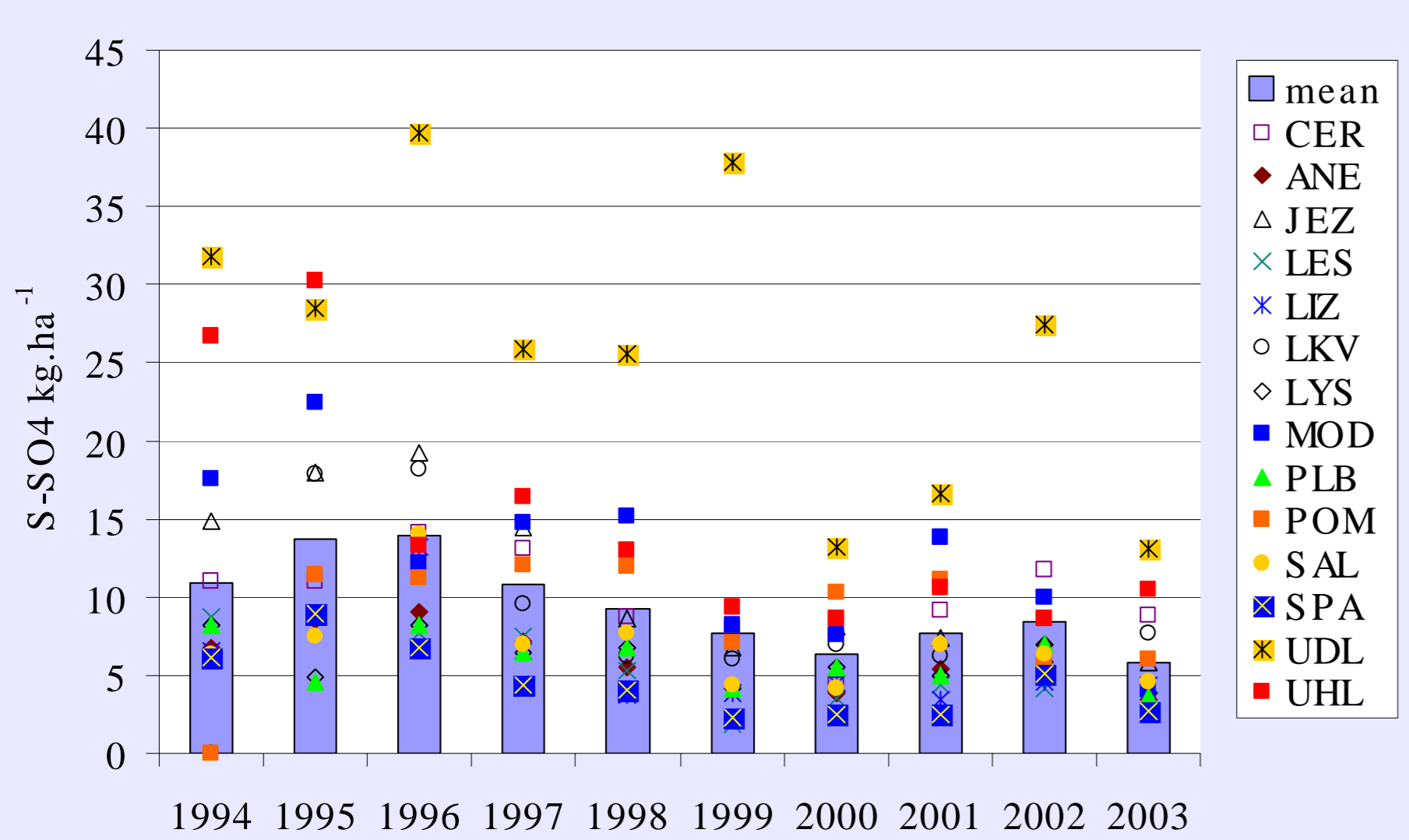
The bulk deposition flux of H^+ decreased from 0.38 $\text{kg}\cdot\text{ha}^{-1}$ to 0.13 $\text{kg}\cdot\text{ha}^{-1}$. Similar significant changes in deposition fluxes were detected for S and F. Other elements including N did not reflect the pattern of changes of H, S and F due to considerable influence of other sources of air pollution apart from coal burning.

Throughfall

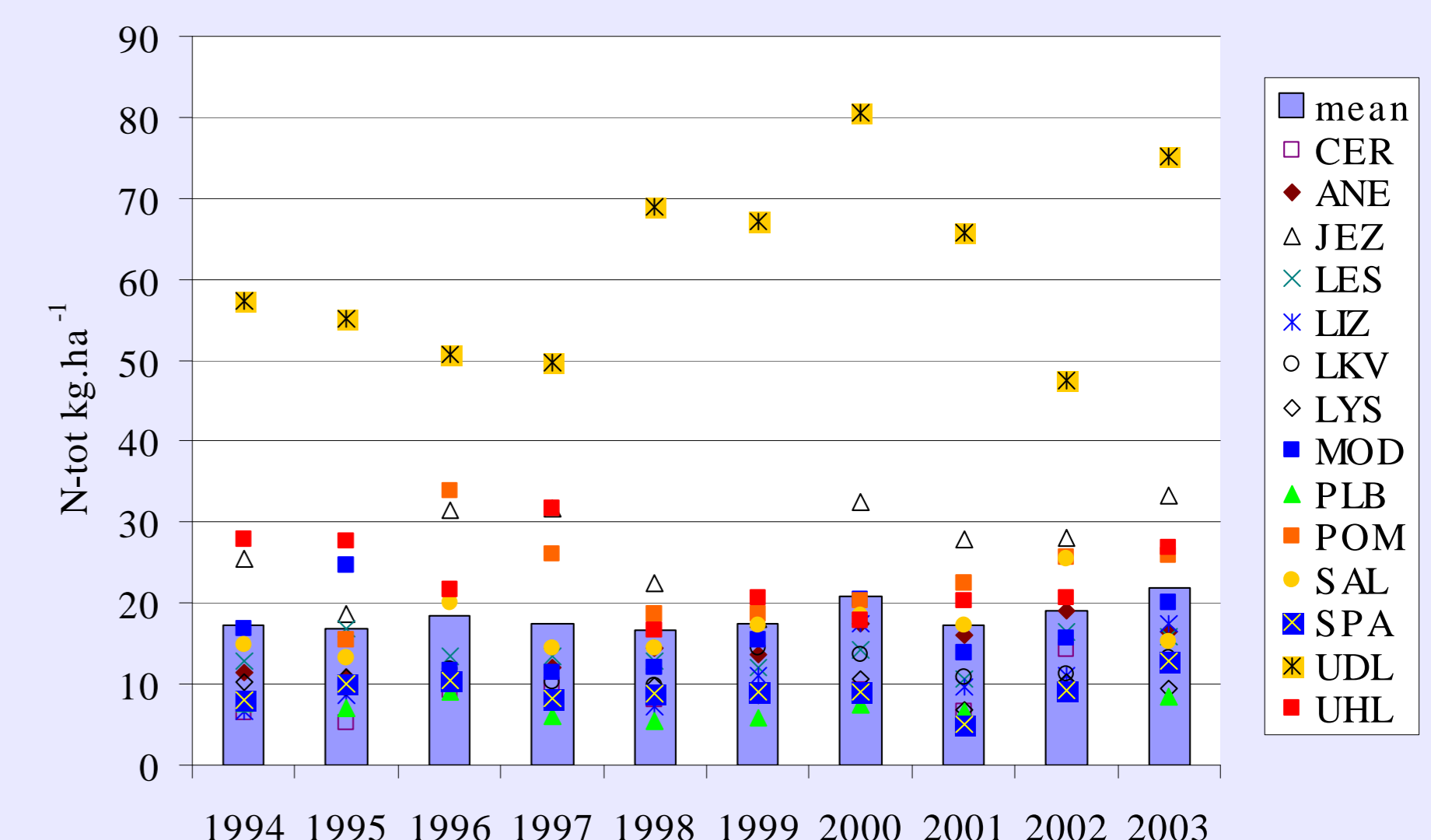


The mean deposition flux of S in throughfall decreased significantly from 36.4 $\text{kg}\cdot\text{ha}^{-1}$ in year 1994 to 16.4 $\text{kg}\cdot\text{ha}^{-1}$ in year 2003. Similarly as for bulk precipitation the fluxes of H, S and F decreased most significantly, what recognized coal burning emissions as their main source.

Further large decreases of acid deposition are not expected since all the coal powerplants in the Czech Republic were desulfurized in the 1990s. The residual deposition flux of S was attributed to long-range transport and residual S emissions.



On the other hand the mean deposition flux of N in throughfall increased from 17.3 $\text{kg}\cdot\text{ha}^{-1}$ in 1994 to 21.9 $\text{kg}\cdot\text{ha}^{-1}$ in 2003. This increase of N deposition flux in throughfall might be a result of the over-saturation of ecosystems with deposited N or a result of increasing number of N emitting sources such as vehicles and gas powered heating plants etc.

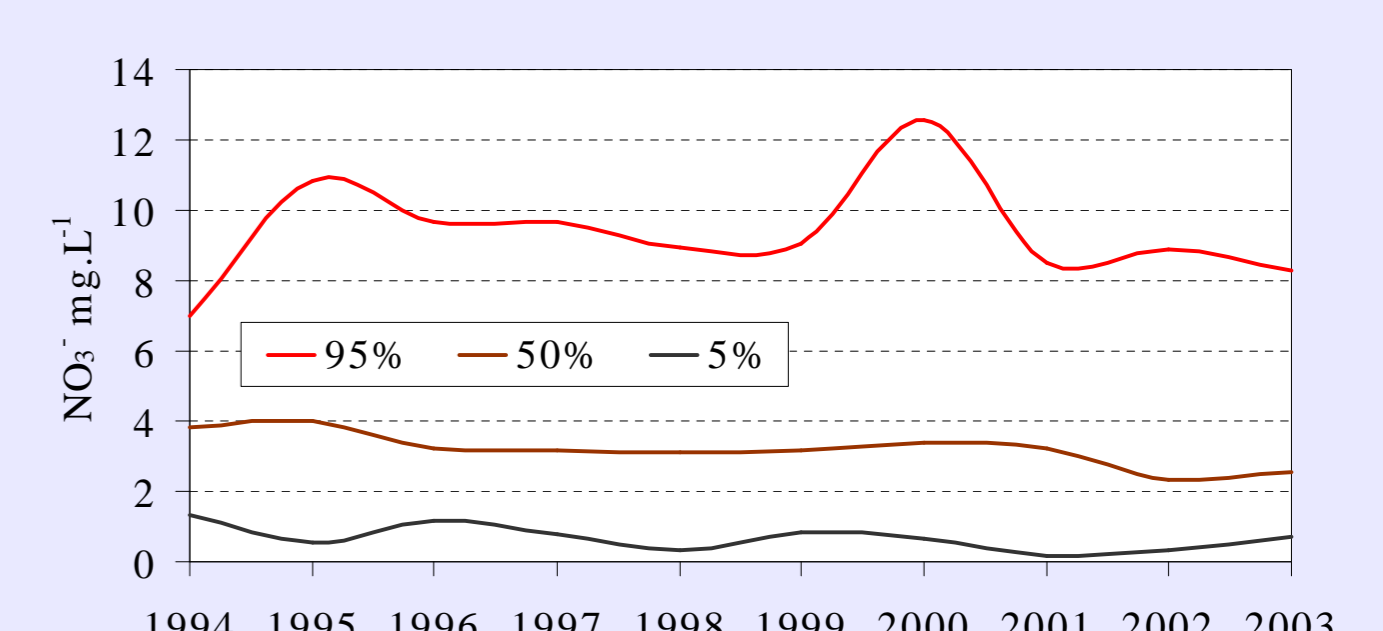
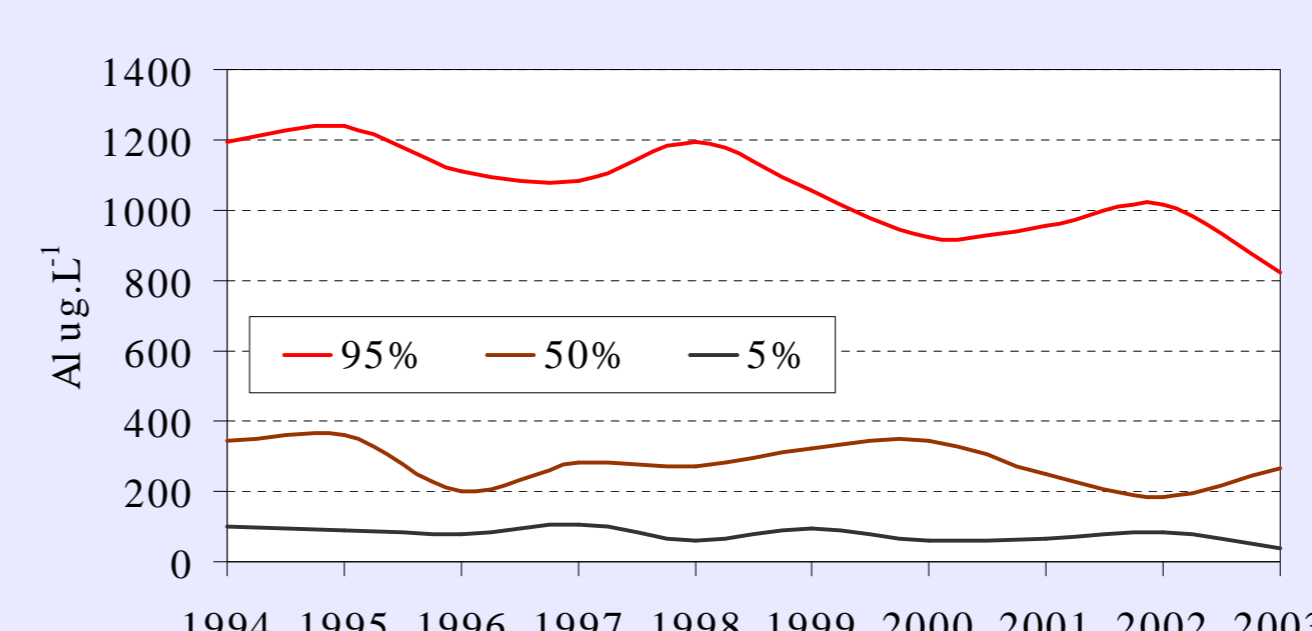
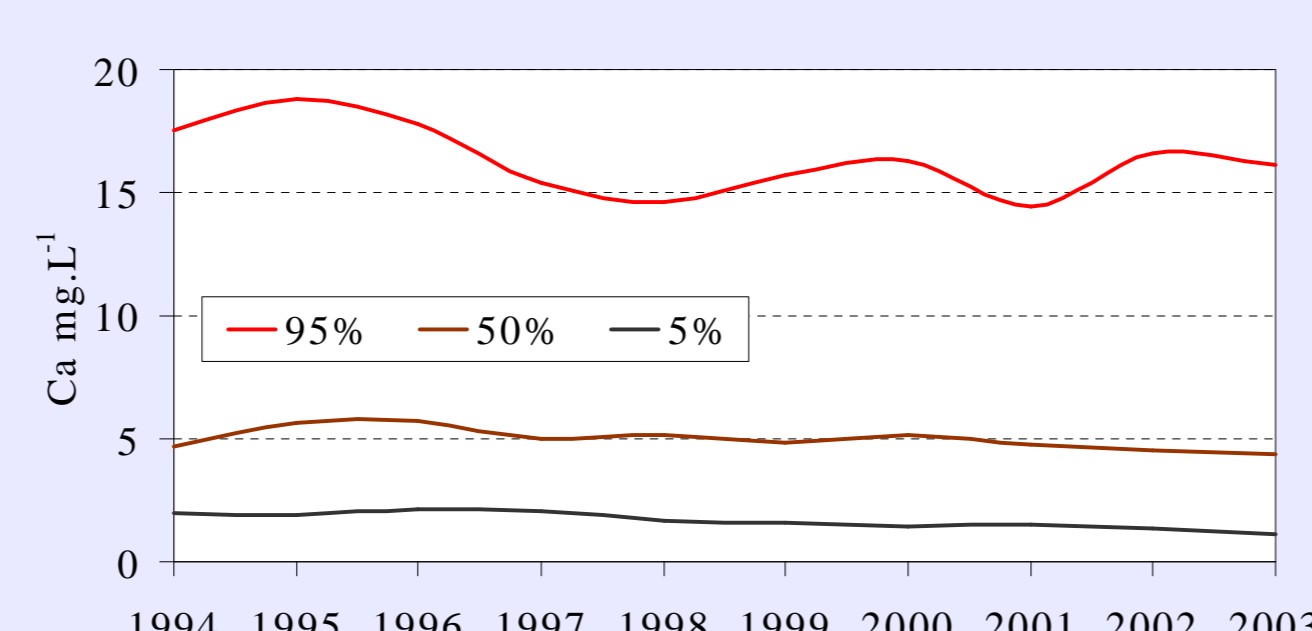
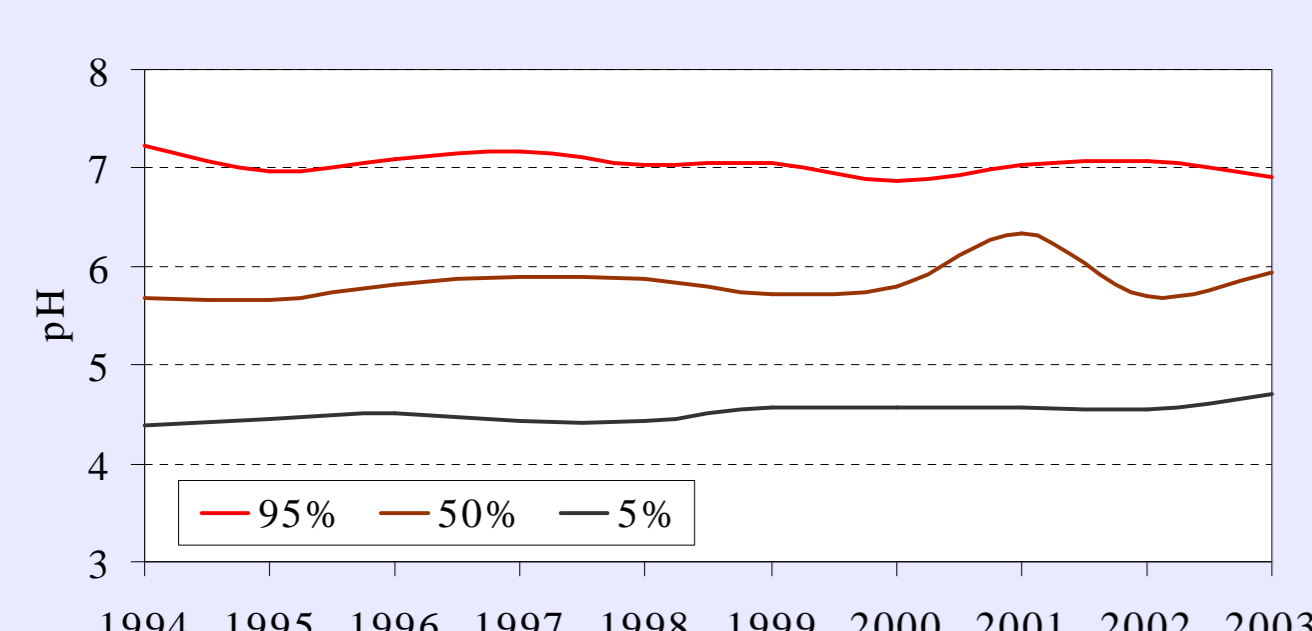


Stream water

Changes in output fluxes from the GEOMON catchments differed according to specific local conditions at each of the catchments.

The most important factors were the catchment altitude, precipitation and runoff height, mean annual temperature, vegetation cover and bedrock geology.

Temporal changes of selected parameters in streamwater of the monitored catchments - expressed by means of 5% and 95% quantiles.



Acknowledgments

The data presented in this study were acquired with support of projects from Grant Agency of the Czech Republic, Ministry of Environment of the Czech Republic and institutional project of the Czech Geological Survey.