# Abstract

This thesis deals with the study of tree growth divergences, both in terms of climatic signal instability and the formation of subpopulations with different growth trends at one site (so-called individual growth variability, IGV). The aim of this work was to detect IGV and climatic instability and determine possible effects of geographical factors on divergence in forests of Scotch pine (Pinus sylvestris) from low altitudes and Norway spruce (Picea abies) from the high-elevation forest, that is typical habitats of two important Central European conifers. For this purpose, the dendrometric parameters of all trees were measured at two sites in Kokořínsko and two in the Krkonoše Mts. Climatic instability was detected by moving correlations of site chronologies with climate. A paired t-test of climate-growth responses of all trees was used to determine the change in response between two time windows. Principal Component Analysis (PCA) was used to reveal divergent growth trends within stand to develop responder chronologies. Variability was explained by correlations of z-scores of trees with individual conditions (topography, tree size, competition index).

The results show that the reaction of trees to climate changes over time. In spruce, the limiting effect of summer temperatures has been recently reduced, and a new negative response to drought emerged. Pines deepened their negative relationship to temperatures and strengthened the response to drought. Overall, these changes were more pronounced in Norway spruce in the Giant Mountains. Individual growth variability is lesser in Norway spruce compared to Scotch pine. The reason may be a greater age diversity in pine habitats and the impact of acid deposition in the Giant Mountains, which has increased spruce growth coherence. In addition to the natural variability and unexplained variability, IGR is mainly influenced by the size of the tree.



Key words: growth divergence, climatic signal instability, Scots pine, Norway spruce, principal component analysis