# Abstract

Despite its intraplate tectonic setting, the Bohemian Massif underwent relatively intense tectonic activity during the Cenozoic. This activity has significantly formed the terrain morphology and river geometry, which can easily be observed from the present status of the streams and relief. Although the effect of tectonics and climate on the terrain morphology has been already researched in previous studies, the effect on the geometry of the river systems has not been surveyed complexly. The author´s previous master thesis found two remarkable areas within the Bohemian Massif, where the effect of climate and tectonics on the river system geometry and its changes is very probable – the area of western Bohemia along the Mariánské Lázně Fault and the area of the Novohradské hory Mountains and their foothills.

The focus of this thesis is to study the mutual interactions between the tectonic activity and the geometry of selected river systems in the Bohemian Massif. The goal is not only to prove the connection but also to test and evaluate the set of methods that can be useful for localizing those places with recent tectonic activity and which can be applied in similar areas in the future.

Both areas – along the Mariánské Lázně Fault and in the Novohradské hory Mts. and their foothills - were surveyed by identical or similar methods in order to compare the results of particular areas to each other and to evaluate the methods used and improve them for further use. The geomorphological methods of remote sensing were used in this thesis (and in the individual papers, which are the essential parts of it) – morphotectonic analysis, analyses of longitudinal stream profiles, stream gradient, Stream-Length index, Hypsometric index, Basin asymmetry, Mountain-front sinuosity, Valley-floor ratio and valley cross-sections. The results obtained were verified by aerial geophysics, field applied geophysics and a field structural survey. Moreover, the localities of Miocene, Pliocene, and Pleistocene fluvial deposits and river terraces, which could be used for to reconstruct the geometry of the previous stream network, were mapped during the research. Therefore, the results obtained help to evaluate the tectonic activity and also explain the evolution of the stream network in the late Cenozoic in both study areas.

The results of this thesis have proved that the methods used make a useful working set which can be applied in similar areas elsewhere. Their usefulness and reliability were proved by independent studies focused on a geophysics survey applied in the field (ERT, DEMP) and palaeoseismology in the area of the Mariánské Lázně Fault. The use of the geomorphological methods could also be reliable in the area of the Novohradské hory Mts. Based on the results, it is suggested that both study areas have undergone a significant tectonic uplift during the Late Pliocene, Pleistocene and probably - in the case of the Mariánské Lázně Fault – even Holocene. The tectonic activity did not take place in a single event,

instead it has been segmented activity along the Mariánské Lázně Fault, or the uneven uplift of blocks in the area of the Novohradské hory Mts. This segmented activity has made a significant impact on the changes in water stream geometry and the evolution of the drainage network in general (river capturing, etc.) The diversely located fluvial deposits of Pliocene and Pleistocene age act as evidence of the drainage's evolution. On the basis of the morphostratigraphical analysis and on the survey of the relationship between fluvial deposits and tectonic structures, it is possible to reconstruct the evolution of the river network. It appears that two main tectonically induced changes to the drainage pattern have occurred in both study areas: first between the Late Miocene/Early Pliocene and the Late Pliocene, and second between the Late Pliocene/Early Pleistocene and the Late Pleistocene or the present. The exact timing of the processes is the subject of future research. This thesis helps to find those localities that are suitable for future dating and palaeoseismological analysis.