

The main objective of the work was to determine the extent to which the rocks forming the outcrops in the area between the Ústěcký and Košátecký Creek basins are subject to decay and karstification. This was studied by means of acid leaching. The study area contains some of the most important groundwater reserves in the Czech Republic and understanding the local conditions is crucial for proper groundwater management. Samples were collected from exposed rock outcrops in the vicinity of Košátecký Creek and the soluble component (calcite content), degree of disintegration, rock density and porosity were determined by leaching the samples in 10% HCl solution. In general, it was observed that at a low calcite content, the degree of disintegration of the samples during leaching was low, but the porosity of the samples increased. When calcite content exceeded 40%, most samples started to disintegrate at least from 50%. The results showed that there are layers with a high calcite content and high disintegration degree in the study area, which may host karst preferential pathways. Such layers are thin and embedded in thick layers of quartz sandstone. In the second part of the work, the distribution of hydrogeological basins was estimated on the basis of a new base flow map, measured stream flows and groundwater abstractions based on a hydrological balance. The catchment distribution was compared with the existing numerical model from the Rebalance project and the results showed a general agreement in the catchment extent. However, discrepancies were found in many places between the flow directions from the numerical model and the results of stream flow profiling and thermometry. In a future version of the numerical model, it would be advisable to incorporate all available field measurements, in particular to ensure that the model reflects the locations and magnitude of groundwater drainage to surface streams in addition to groundwater levels.