

## **Abstract**

The connectivity of fluvial processes or hydrological connectivity are terms often used to describe internal linkages in landscape that intensify/reduce water and sediment fluxes as well as the substances they contain. It is based on the concept of landscape connectivity defined, in particular, by fragmentation of landscape and barriers that obstruct the movement of material. While researches focusing on water erosion or runoff focus on the volume of different fluxes, connectivity reveals new information on catchment functioning as well as reactions to various types of stimuli, and thus represents a more complex phenomenon. This master thesis informs about the topic as a whole, it describes the main forms of its modelling and specific influences that have major impact on presented results. Three approaches of modelling were tested. The main concept lies in evaluation of the index of connectivity, firstly, with approach proposed by Borselli et al. (2008) and implemented in software ArcGIS and secondly, in software SedInConnect 2.0. The third approach is modelling connectivity in software LAPSUS 5.0 that belongs to landscape evolution models. Modelling in LAPSUS proved that using even this indirect method for evaluation of hydrological connectivity is a suitable approach. Selected area for modelling was catchment of Mladotický stream. Results were verified by field index of connectivity proposed also by Borselli et al. (2008) and compared with real conditions. To enable future applications, all the methods employed in this research are described and deficiencies in the input data are also discussed. It is suggested that some of these deficiencies should be removed. Finally, the work tries to evaluate the use of chosen methods in conditions of Czechia.

**Keywords:** catchment connectivity, hydrological connectivity, sediment connectivity, Index of connectivity, SedInConnect, LAPSUS