



## **Practical aspects of registration the transformation of a river valley by beavers using terrestrial laser scanning**

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Activity of beavers (*Castor fiber*) often significantly affects the environment in which they live. The most commonly observed effect of their being in environment is construction of beaver dams and formation a pond upstream. However, in case of a sudden break of a dam and beaver pond drainage, the valley below the dam may also undergo remodelling. The nature and magnitude of these changes depends on the quantity of water and its energy as well as on the geological structure of the valley. The effects of such events can be riverbank erosion, and the deposition of the displaced of erosion products in the form of sandbars or fans. The material can also be accumulated in local depressions or delivered to water bodies. Such events may occur multiple times in the same area. To assess their impact on the environment it is important to quantify the displaced material. The study of such transformations was performed within a small valley of the river of Struga Czechowska (Tuchola Pinewood Forest, Poland). The valley is mainly cut in sands and gravels. Its steep banks are overgrown with bushes and trees. The assessment of changes in morphology were based on the event of the beaver pond drainage of 2015. The study uses the measurements from the terrestrial laser scanning (scanner Riegl VZ-4000). The measurements were performed before and after the event. Each of the two models obtained for comparison was made up of more than 20 measurement stations. Point clouds were joined by Multi-Station Adjustment without placing in the terrain any objects of reference. During measurements attention was paid to the changes in morphology of both riverbed and valley surrounding. The paper presents the example of the recorded changes as well as the measurement procedure. Moreover, the aspects of fieldwork and issues related to post-processing, such as merging, filtering of point clouds and detection of changes, are also presented.

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