

## **Abstract**

The main task of this work was the creation of digital terrain models in vanished areas because of the coal mining and comparing changes in relief. It was created two digital terrain models showing the relief situation in 1950, before the massive mining of brown coal, and in 2010, after the completion of mining. DTM were covered by orthophotos from 1953 and 2011. The entire work of DTM was conducted in GIS. It were created image thumbnails and animations of these models and it was analyzed the changes in relief.

Another task was to compare the hydrological conditions in the area that have changed due to the great relief changes. For this purpose it was used hydrological tools as an extension to GIS. The results are the analysis comparing hydrological conditions between 1950 and 2010.

As the model area was chosen 4th order catchment area around the vanished village Kocourkov in Teplice region. 4th order catchment area was chosen for better view on changes in hydrological conditions. In the work were used a variety of historical and contemporary sources, such as maps, orthophotos and database of geographic data.

**Keywords:** relief changes, relief reconstruction, DTM, hydrological changes, hydrological tools, GIS