

# **ENVIRONMENTAL MODELLING OF LAND USE CHANGES IN THE NEIGHBOURHOOD OF COAL MINES WITH THE GIS**

## **Abstract**

Human society causes an increasing pressure on land and its use. The requirements and demands of humanity has significantly changed in the last few decades. This is the foundation of continuous environmental impacts, particularly in those areas where mining companies exploit natural resources on a large scale for personal and economic well-being, and thus significantly transform the land surface. The objective of this thesis is to refer to changes in land use in the vicinity of surface coal mines in the districts of Chomutov, Most, Teplice and Sokolov where these coal mines take up large areas. We do so with the help of remote-sensing-based documentation and GIS applications. Mining dramatically transforms the appearance of surrounding landscapes and has a high impact on the environment. The thesis shows the change of land use based on both the images from the Landsat satellite and the inclusion in basic Corine categories in which was created layer of land cover for 1990, 2000, 2006 and 2012, and further shows the ecological stability of the landscape from 1986 up to now. The evolution and changes of ecological stability are analyzed with the help of ecological coefficient, cluster analysis, linear regression and supervised classification using CORINE Land Cover. Two categories of CORINE have been selected as an indicator for the assessment of changes; category no. 131 - mineral resources production, and category no. 132 - dump sites. Considering the ever increasing human population and economic development, we can expect another growth in pressure of humand activity on the landscape. It is therefore necessary to recultivate the mined out areas in order to ensure the sustainable use of these areas in balance with nature for future generations.

**Keywords:** Landsat, CORINE, land use, classification, GIS