

Abstract

This work assesses the suitability of selected tools of GIS and remote sensing for classification of black and white aerial photography to analyze changes in land cover in the basin of the upper Chomutovka. Area of interest is located in the highest parts of the Krušné hory mountains, which have historically been significantly affected by imission fallout that resulted in massive forest die-back. For the purpose of quantifying these changes, a series of aerial photographs from 1975 and 1987 were used as a source of data. Selected dates approximately define the interval of the largest forest dieback in the Krušné hory mountains and their comparison well illustrates the extent of this process. These images were combined and orthorectified and than classified by manual vectorization.

For orthorectification and mosaicing OrthoEngine module of program Geomatica 10.0 was used. It turned out that due to the specific characteristics of historical aerial photographs resulting orthophoto can show the obvious shortcomings, especially the local deformations, which misrepresents the actual dimensions of landscape components and therefore it is not applicable for accurate classification. For this reason, the reverse process was chosen in which the images were firstly merged automatically in the program Hugin and the resulting combined image was subsequently rectified. The orthophoto obtained in this manner showed a much greater accuracy and brightness balance.

Classification and its quantification showed a significant decrease in the forests, which in 1987 accounted for only 47 % of forest area in 1975. At the same time, however, the classification showed difficult interpretability of black and white aerial photographs, which may be reflected in the accuracy of the data.