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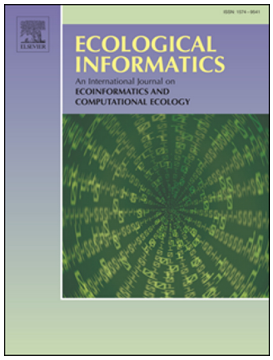

Depiction of uncertainty in the visually interpreted land cover data

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ACCEPTED MANUSCRIPT

Depiction of uncertainty in the visually interpreted land cover data

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Abstract:

Remote sensing data analysis to infer land cover and the subsequent modelling of land use change are subject to uncertainties, which may have an impact on the accuracy of future land-use predictions. Part of these uncertainties come from the visual interpretation of remote sensing data as during this phase a specific knowledge and expertise are crucial. Visual interpretation includes the meaning of the image content but also goes beyond what can be seen on the image to recognize spatial and landscape patterns. The quality of recognition depends on the expertise in image interpretation and visual perception. Based on this statement, it is necessary to visualize also the information about uncertainty. This paper describes different perspectives of uncertainty visualization on the example of visually interpreted aerial photographs in a mining area. The study is focused on visualization techniques for uncertainty awareness analysis of land cover data. This approach should contribute to better understanding, assessment and potential spreading of visual information of uncertainty and help to appraise the data critically. The goal of this paper is to raise uncertainty awareness among practitioners who deal with land cover data and stress the visualizations techniques as a more reliable means to assess the quality, and hence the uncertainty, of these data.

Introduction:

Land cover and land use data represents the basic data input for a wide range of applications in the environmental field (Ahlqvist et al., 2015; Leyk et al., 2005; Miřijovský et al., 2015; Pechanec et al., 2014). This data can be processed at different spatial and content detail levels, using remote exploration of the Earth (Hunsaker et al., 2013). A very close relationship between the use of the terms land cover (LC) and land use (LU) often leads to confusion of the two concepts. In many maps, LC and LU are often used together: natural and semi-natural areas are described using LC categories, while agricultural and urban parts use LU categories. However, both terms are fundamentally different and they are not interchangeable. An exception may be a situation where the presented material (results of research, statistics, etc.) includes data from both disciplines. LU is therefore the sum of arrangements, activities and inputs which people undertake in a certain type of LC (Jansen

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