MODELLING OF HABITAT TYPES IN KARST LANDSCAPE WITH HIGH RESOLUTION SATELLITE IMAGERY AND DIGITAL TERRAIN MODEL

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ABSTRACT:

In order to get knowledge on natural environment and biodiversity the Centre for Cartography of Fauna and Flora collected, classified and mapped habitat types in different Slovenian regions. However, detailed field mapping is time consuming and logistically demanding. Therefore the main aim of this study was to explore the possibility of modelling habitat types in Karst region (Kras) in SW Slovenia, which is situated on the phyto-geographical border between Mediterranean and Dinaric region. The study area is also characterized by its karst phenomena and underground hydrology. These distinctive natural characteristics contribute to the local high biodiversity. With the research presented in the paper we tried to observe and numerically describe this habitat diversity using high resolution satellite imagery and other digital data.

We used different modelling techniques in the research, based on 5-band RapidEye satellite images and 5 m digital terrain model. At the first we explored the basic properties of the existent habitats, then we used different unsupervised classifications methods (among others k-means) in order to find 'natural' groups and to compare them with the mapped habitat data. Secondly, we sought for the best supervised model of habitat types at different scales. For this reason we tested different supervised classification methods (e.g. decision trees). We examined how habitat types can be properly distinguished with remote sensing and other GIS techniques at different levels of habitat classification and most importantly we obtained a comparison of modelling success at different levels. We divided habitat polygons into training and testing samples in order to validate the results.

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