

Recognition and classification of patterned ground polygons from remote sensing data

Abstract

The main objective of this thesis has been to prove the possibility of using object based image analysis classification for identification of the ice-wedge polygons and to find general method for their classification. The thesis contains a comparison of the object based and pixel based classification of the subject. The three classification rulesets for OBIA were developed on three test sites on Mars captured by HiRISE sensor. As a result, the general classification approach is suggested. The manually collected datasets, which are common in geomorphological research, were used as the reference sample. The OBIA classification provided better results in all three cases, whereas the pixel classification was valid in only one case. Another objective has been the automatization of the process of gaining information about morphometric characteristics of the ice-wedge polygons and the subsequent classification of the polygons. Within the scope of the process were developed methods for creating polygonal network and specified parameters of those methods. Several toolboxes for the ArcGIS software were prepared and they are part of the results of the thesis.

Keywords: patterned ground, ice-wedge polygons, remote sensing, OBIA, HiRISE