High scale landscape mapping for mountain of Khamar-Daban (near Lake Baikal, Russia)

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Classification of homogeneous geosystems (landscapes) and its reflection on the map could be a base for effective organization of economic activity. Landscape patterns and landscape units can be used in the assessment of ecosystem service supply. Geosystem defined as uniform territory, with regular and typical repetition of some interrelated combinations of geological structures, landforms, surface and groundwater, microclimates, soil types, phytocoenoses and zoocoenoses. The aim of research is analysis and mapping of the landscape diversity of the key area (125.3 km2) of the Khamar –Daban mountain range which actively used for mountain tourism. This mountain range distinguished by the uniqueness of vegetation related to climate features: significant moisturizing, high snow cover and other. We used the following data: fieldwork (73 test areas), Digital elevation model (SRTM), and remote sensing (Landsat 8). Fieldworks were conducted in summer seasons 2010 and 2015 years where collected data about wood and grass species and their projective cover, soil characteristics. Software Quantum GIS (Qgis) 2.10 was used to create the landscape map. At the first step the area was divided on the base of SRTM data on categories of landform: surface of drainage divide, river and stream valleys for their definition were added to the vector layer to the information of the natural drainage system of the territory which was made on the basis of the topographic map 1: 50000 scale, several classes of slopes according their steepness (min steepness value 0, max steepness value 40.05), exposure (8 different categories have been allocated for different, exposure: north, northeast, east, southeast, south, southwest , west , northwest. Then these patterns divided on the base of Landsat 8 image (2014 year) in band combination 753 (picture 1). This combination allow to get high color contrasts: healthy vegetation appears as bright green, the soil - mauve. This information was very useful for the vegetation studying and for the analyzing of health condition of forest communities. Results of fieldworks and the geoinformation analysis were used to form the classification of the landscapes which became the map legend. In classification 38 types of geosystem defined. On the map 654 homogeneous geosystem patterns digitized. Map accuracy was tested under field conditions.

Keywords: landscape mapping, geosystem classification, Khamar-Daban mountain range

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