

Assessment of soil-vegetation cover condition in river basins applying remote sensing data

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Constant observation of vegetation and soil cover is one of the key issues of river basins ecologic monitoring. Lately remotely determining vegetation indices have been used for this purpose alongside with terrestrial data. It is necessary to consider that observation objects have been continuously changing and these changes are comprehensive and depend on temporal and dimensional parameters. Remote sensing data, embracing vast areas and reflecting various interrelations, allow excluding accidental and short-term changes though concentrating on the transformation of the observed river basin ecosystem environmental condition.

The research objective is to assess spatial – temporal peculiarities and the dynamics of soil-vegetation condition of the Klyazma basin as whole and minor river basins within the area.

Research objects are located in the centre of European Russia.

Data used in our research include both statistic and published data, characterizing soil-vegetation cover of the area, space images («Landsat» ETM+ etc.)

Research methods. 1. Dynamics analysis NDVI (Normalized difference vegetation index) 2. Remote data have been correlated to terrestrial measurement results of phytomass reserve, phytoproductivity, soil fertility characteristics, crop capacity (<http://biodat.ru>) 3. For the digital processing of space images software Erdas Imagine has been used, GIS analysis has been carried out applying rc GIS.

NDVI computation for each image pixel helped to map general condition of the Klyazma vegetation cover and to determine geographic ranges without vegetation or with depressed vegetation. For instance high vegetation index geographic range has been defined which corresponded to Vladimir Opolye characterized with the most fertile grey forest soil in the region.

Comparative assessment of soil vegetation cover of minor river basins within the Klyazma basin, judging by the terrestrial data, revealed its better condition in the Koloksha basin which is also located in the area of grey forest soil. Besides here the maximum value of vegetation index for all phytocenosis was detected. In the research the most dynamically changing parts of the Klyazma basin have been determined according to NDVI dynamics analysis. Analyzing the reasons for such changes of NDVI the most significant ecologic processes in the region connected to the changes of vegetation cover condition have been revealed. Fields overgrowing and agricultural crops replacement are the most important of them.