



Structure and condition of soil-vegetation cover in the Klyazma river basin applying remote sensing data

Natalia Mishchenko, Tatiana Trifonova, and Roman Repkin
Vladimir State University, Vladimir, Russian Federation (natmich3@mail.ru)

Constant observation of vegetation and soil cover is one of the key issues of river basins ecologic monitoring. 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 of soil-vegetation structure formation in the Klyazma basin as a 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.

Research methods:

Remote data analysis for assessing land utilization structure and soil-vegetation condition according to NDVI.

Laying soil-geobotanic landscape profiles river valleys slopes.

Phytomass reserve, phytoproductivity, soil fertility characteristics assessment.

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.

Soil-geobotanic profiles, laid in minor river basin of the Sudogda, allowed to reveal various vegetation association and to describe the confined soil profile. It is shown that well drained landscape forms correspond to arboreal vegetation type, more humidified elements of the landscape are occupied with gramineous meadow vegetation. There is sand and clay sand under mixed forest humus horizon. In pinewood forests light loam prevails in surface horizons.

The results can be used for environmental monitoring of the river basins and for rational agricultural structuring.