

Automated Identification of Low-Density Stands of a Mixed Forest Area with Use of Medium Resolution Satellite Data on the Example of Uchebno-Opytnyj Leschoz BSUET

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Relatively stand density is one of the most important taxation indicators, which allows determining the stock of stands and characterizing its condition. The relatively stand density of a forest as a characteristic of the actual productivity of a particular plantation.

Terrestrial and statistical methods in their practical application require laborious calculations and significant costs. That is why at present, modern and affordable methods of remote sensing have acquired special significance for monitoring the state of the lands of the forest fund.

The paper analyzes the possibility of automated detection of low-density stands, passed through selective sanitary felling, according to the index of forest canopy closure (FCD) based on the average spatial resolution of Sentinel-2. The FCD indicator is a convenient indicator to use for assessing the closeness of woody vegetation and the state of forests when using satellite imagery data. The advantage of this method lies in the possibility of modeling the density of crowns (closeness) without ground training data.

After a regression analysis of ground data and data obtained from forest canopy closure maps, a strong exponential dependence ($r = 0.787$, $R^2 = 0.829$ with p -value < 0.001) between the FCD and the relative fullness of the stand was revealed. Because of the established dependence, maps of relative completeness were created for forest plots covered by selective sanitary felling.