

MAPPING AND SPATIAL DISTRIBUTION ANALYSIS OF HERBACEOUS VEGETATION IN THE TRANSITION AREA OF POLISTOVSKY RESERVE

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Abstract. *Background.* Meadows of the temperate zone are characterized by high biodiversity. Recently their area has been reduced as a result of land use change. Therefore it is important to assess their current state and spatial distribution. However, for the territory of European Russia patterns of spatial distribution are not known, ecology of grasslands is poorly studied, and syntaxonomy is not fully developed. Our aim was to fill this gap using traditional geobotanical methods and mapping with remote sensing data. *Materials and methods.* We use 278 relevés of grasslands made in the vicinity of the Polistovsky Reserve (Pskov Oblast) and 11 scenes of Sentinel-2 (2018–2019). We carried out vegetation classification by floristic criteria, DCA-ordination and calculation of Ellenberg's indicator values. Remote data (Sentinel scenes) were classified by Random forest algorithm using 234 predictors (derivatives of satellite images). The resulting maps were validated with randomly distributed points and drone images. *Results.* The vegetation classification scheme has been developed, maps of the distribution of syn-taxonomical classes and alliances have been obtained. Overall map accuracy was 83 % for classes and 87.3 % for alliances. The gradients of environmental factors that determine the differentiation of vegetation are identified. *Conclusions.* Alliances of herbaceous vegetation are well detected on the basis of time series of Sentinel-2 images. Peculiarities of spatial distribution of these communities are explained by their ecology. The largest areas are occupied by communities of *Molinio-Arrhenatheretea* class due to their high diversity. The most valuable meadows of the *Molinion caeruleae* alliance are poorly represented in the transition zone of the reserve. On the alliance level, the largest areas are occupied by the communities of the *Convolvulo arvensis-Agropyrion repentis* alliance.

Keywords: herbaceous vegetation, floristic classification, Polistovsky nature reserve, Random forest, remote sensing of the Earth

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