

Filtration methodology for crop classification maps based on Sentinel data

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Many applied tasks, such as crop yield forecasting and land cover change detection, rely on crop classification maps. Within ERA-PLANET project for investigation of Sustainable Development Goals Indicators, land cover maps are vital source of information. Thus it is essential to provide accurate crop classification maps without noise [1, 2]. In each geographic information system software many filters for classification map post processing are available. The most popular and effective post-processing filters are median and majority voting filter that are based on moving windows that slide over the classified image and assign a new class to the central pixel of the given window based on certain rules. The main problem of such filters is changing object shape, smoothing edges and boundaries between different fields and removing narrow objects like roads and forest strips. Therefore, we propose a novel objectbased method for post-processing of the crop classification maps that allows to reduce noise in the maps, to increase their overall accuracy and in the same time to preserve edges, boundaries and narrow objects. The main idea of the object-based method is to explore each group of pixels with the same value of the class as a holistic object, in contrary to commonly used methods based on the principle of a moving window. This approach has been compared with the traditional methods for noise filtering and revealed its advantage in term of accuracy, using statistical McNemar test, and visually for the territory of the Kyiv region in 2017, that has been obtained using Sentinel-1 and Sentinel-2 10 m resolution satellite data [3]. The overall accuracy of the final classification map (94.2%) increased by 2.3% compared to the original map (91.9%) and by 0.6% compared to the improved voting method.

References

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