**Forest change detection using multi-temporal Sentinel-2 data and 3D-CNN**

Shapiro Yu.S.1, Fedoseev V.A.1\*, and Korchikov E.S.2

1 Geoinformatics and Information Security Department, Samara National Research University, Russia

2 Ecology, Botany and Natural Protection Department, Samara National Research University, Russia

[vicanfed@gmail.com](mailto:vicanfed@gmail.com)

***ABSTRACT***

This article proposes methods for using multitemporal Sentinel-2 satellite images to detect changes in forest areas for correcting forest inventory data. Sentinel-2 images taken over the course of one year are combined into a composite. The resulting composite can then be used as a feature vector. Existing digital forest inventory data (possibly partially outdated and not reflecting the current state on the ground) are used to label forest areas and analyze the classifier's performance. A mismatch between the classifier's results and the specified labels may indicate either a change in the forest type on the ground or an issue with the classifier's operation. This study explores the possibility of training a 3D convolutional neural network for forest type classification. The paper also presents the results of comparing the proposed method with a classifier based on the support vector machines and actual inventory data.

**Keywords:** remote sensing, temporal analysis, forest inventory data, Sentinel-2, convolutional neural networks