

Abstract

This bachelor thesis is focused on the comparison of Random Forest (RF) and CART classifiers on the example of the Ethiopian region of Sidama. An analysis of land cover change between 2014 and 2020 was performed for this region. The cloud-based platform Google Earth Engine (GEE) was used for classifications. Supervised classifications were performed on images from Landsat 8 and Sentinel-2 missions, which were retrieved from the Earth Engine data catalogue. Data from in-situ measurement was used for training polygons, variability of input data over time was verified with Google Earth Pro. In the research part, the work deals with the methods and results of research that were conducted in a topic close to this work. In the empirical part, the work deals with the analysis of Landsat 8 and Sentinel-2 data. The temporal, spatial and spectral resolution were compared. In terms of temporal resolution, it has been shown that Sentinel-2 data allows up to three times more images for the same area thanks to the two satellites scanning in parallel. Spectral and spatial resolution of Sentinel-2 allows better observation of smaller and less distinguishable elements. The data was then used for land cover classifications using RF and CART classifiers in the cloud-based GEE environment. The RF classifier made it possible to obtain higher overall accuracy, up to 82 % for Sentinel-2 data and 80 % for Landsat 8 data. The RF classifier was used to analyse changes between 2014 and 2020 using Landsat 8 data. In contrast with CART whose overall accuracies for both types of satellite data were lower.

Keywords: land cover change, supervised classification, Random Forest, CART, Google Earth Engine, Landsat 8, Sentinel-2, Sidama