

Land Use/Land Cover Mapping Using Landsat 8 and Sentinel-2 in a Mediterranean Landscape

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Abstract : Spatial-explicit and up-to-date land use/land cover information is fundamental for spatial planning, land management, sustainable development, and sound decision-making. In the last decade, many satellite-derived land cover products at different spatial, spectral, and temporal resolutions have been developed, such as the European Copernicus Land Cover product. However, more efficient and detailed information for land use/land cover is required at the regional or local scale. A typical Mediterranean basin with a complex landscape comprised of various forest types, crops, artificial surfaces, and wetlands was selected to test and develop our approach. In this study, we investigate the improvement of Copernicus Land Cover product (CLC2018) using Landsat 8 and Sentinel-2 pixel-based classification based on all available existing geospatial data (Forest Maps, LPIS, Natura2000 habitats, cadastral parcels, etc.). We examined and compared the performance of the Random Forest classifier for land use/land cover mapping. In total, 10 land use/land cover categories were recognized in Landsat 8 and 11 in Sentinel-2A. A comparison of the overall classification accuracies for 2018 shows that Landsat 8 classification accuracy was slightly higher than Sentinel-2A (82,99% vs. 80,30%). We concluded that the main land use/land cover types of CLC2018, even within a heterogeneous area, can be successfully mapped and updated according to CLC nomenclature. Future research should be oriented toward integrating spatiotemporal information from seasonal bands and spectral indexes in the classification process.

Keywords : classification, land use/land cover, mapping, random forest

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