Abstract

For several years, Landsat imageries have been used for land cover mapping analysis. However, cloud cover constitutes a major obstacle to land cover classification in coastal tropical regions including Lagos State. In this work, a land cover appearance for Lagos State is examined using Sentinel-1 synthetic aperture radar (SAR) and Land Satellite 8 (Landsat 8) imageries. To this aim, a Sentinel-1 SAR dual-pol (VV+VH) Interferometric Wide swath mode (IW) data orbit for 2017 and a Landsat 8 Operational Land Imager (OLI) for 2017 over Lagos State were acquired and analysed. The Sentinel-1 imagery was calibrated and terrain corrected using a SRTM 3Sec DEM. Maximum likelihood classification algorithm was performed. A supervised pixel-based imagery classification to classify the dataset using training points selected from RGB combination of VV and VH polarizations was applied. Accuracy assessment was performed using test data collected from high-resolution imagery of Google Earth to determine the overall classification accuracy and Kappa coefficient. The Landsat 8 was orthorectified and maximum likelihood classification algorithm also performed. The results for Sentinel-1 include an RGB composite of the imagery, classified imagery, with overall accuracy calculated as 0.757, while the kappa value was evaluated to be about 0.719. Also, the Landsat 8 includes a RBG composite of the imagery, classified imagery, but an overall accuracy of 0.908 and a kappa value of 0.876. It is concluded that Sentinel 1 SAR result has been effectively exploited for producing acceptable accurate land cover map of Lagos State with relevant advantages for areas with cloud cover. In addition, the Landsat 8 result reported a high accuracy assessment values with finer visual land cover map appearance.

Keywords