

Abstract

Vegetation is a part of liveable human society. This means that grass, shrubs and trees, which are visible in parks and gardens, are present in human communities and urban areas. Vegetation has a number of tangible benefits to humans, so, the mapping of vegetation in urban environments, whether it be small or large areas, is very important. Vegetation maps can be used for several purposes ranging from, but not limited to, monitoring street trees to conducting analysis of impact on human health. Recently, the use of satellite remote sensing techniques has become popular in mapping urban vegetation due to a huge archive of data and its free availability, at least for medium and lower spatial resolutions. Different satellite imagery is available, with differing resolutions (spatial, spectral, swath and temporal) and as there always has been a tension between accuracy and cost when it comes to mapping the focus of this project is to explore this tension when mapping urban vegetation. The research focuses on information accuracy of vegetation mapping which should be interest when researchers are not from the field of remote sensing and who used remote sensing techniques to map urban vegetation often using indices like Normalised Difference Vegetation Index (NDVI). These researchers often do not disclose or discuss the values of the selected NDVI threshold. So, the main objective of this research is to compare the results which are obtained from using different types of satellite imagery, along with their respective resolutions and different methods with ground truth. This comparison will help to provide an insight on how the accuracy differs over different images, with different resolutions and different processes used. For this comparison varying vegetation maps were obtained by using the Thresholded Normalised Difference Vegetation Index (THNDVI) and supervised classification methods on multispectral satellite images with a spatial resolution varying from 2 metres to 30 metres. The results from this thesis indicate that when THNDVI is used on Pleiades imagery (high-resolution imagery) it yields most accurate result. This thesis also indicates the major cost drivers while mapping urban vegetation. This study not only helps to determine which method is accurate, but also what resolution of satellite imagery can be used to obtain the desired results. In addition, this research demonstrates the critical importance of setting the correct threshold in NDVI when classifying vegetation on the basis of NDVI.