



Analyzing difference of vegetation condition of urban forest interiors and forest edges by land use types using Monthly NDVI and NDWI images

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Due to urbanization and human impacts, the forests in the urban areas have been getting fragmented and forest edges are increasing. Since Forest edges have a larger exposure than the forest interiors, they are more exposed by heat from adjacent buildings and especially adjacent land use types, this will affect soil moisture and vegetation condition.

Here, we hypothesize that the impact on edge of vegetation will be different depending on land use types. Therefore, purpose of this study is to analyze the difference in vegetation condition of urban forest interiors and forest edges in terms of different land use types.

Our study area is located at Seoul Metropolitan area, one of the most urbanized city in Republic of Korea. In this study, we made average of 2015, 2016, 2017 monthly NDVI and NDWI images which have 30m spatial resolution, derived from FSDAF(Flexible Spatio-temporal DATA Fusion) fusion method using MODIS images and Landsat 8 OLI images. Then we analyzed difference of vegetation condition of urban forest interior and forest edge with different adjacent land use types(Residence, Road, Agriculture, Grassland).

We found that both NDVI value of the Broad leaf and the Needle leaf forest edge was the lowest, and it was increased as the distance from the forest edge. In other words, the edge of both forest types are affected by the adjacent land use. The type of land use, which had the greatest effect on the forest edge was shown as road, and the effect range was found to be up to 30 meters from the forest edge. This means the management of the forest edge nearby roads will be necessary during road development or after development.

This study considered land use types for forest monitoring and assessment of urban forest and edges. We think the results of this study would be useful for assessing the effects of land use types and land use change on forest edges in terms of urban forest monitoring and management.