Abstract

Scanning the Water-Centered Transversally Connected Natural Landscape Mosaics within the Metropolitan Area in Support of NBS for Urban Challenges †

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Abstract: This study presents an analytical method to identify the transversally connected natural landscape mosaics (TCNLMs) being in physical contact with the water surfaces of the territory at the metropolitan scale. It makes a comparative case between three Swedish cities; Helsingborg, Goteborg, and Malmo utilizing Urban Atlas land cover geospatial data and QGIS software. Fundamentally, the analytical process is based on the physical relationship the natural surfaces have with the water surfaces. The assessment is based on the concept of "bands" instead of "buffer" zone in reference to water sources. The land cover surfaces in touch with water surfaces are categorized as band 1. The remaining surfaces that are adjacent with band 1, are categorized as band 2. Similarly, the remaining land cover surfaces can be classified into further bands. The reclassified patches by their band level, are introduced into an analytical process structured in three levels. First, the natural surfaces are filtered and the existing TCNLMs (public land) within the metropolitan area are identified. Second, the agricultural areas are joined with the natural surfaces in order to measure their impact in the enhancement of TCNLMs. At the third level, the method gives floor to the identification of potential artificial surfaces (private land), the naturalization/ restoration of which may extensively enhance the transversal connectivity of natural lands to water sources. The potential artificial and agricultural surfaces as private property are targeted as private land for ecosystem services especially for urban ecological issues and disaster risk reduction. The workflow of the study is structured in Graphical Modeler (QGIS 3), enabling easier reproducibility of the method to similar study areas. The results of the study show that the proposed method is useful in scanning the transversally connected mosaics of natural lands and their potential enhancement. Finally, it contributes to the development of GIS-based analytical methods in support of natural based solutions for metropolitan challenges.

Keywords: Nature Based Solutions; urban challenges; QGIS; private land for NBS; LAND4FLOOD