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Ecological characterization of urban and periurban green areas in european cities from a nature based solution perspective.

Juan F. Martinez-Murillo (1), Paloma Hueso-González (1), Ricardo Remond (2), Paulo Pereira (3), Sander Jacobs (4), Jörg Priess (5), Carla Ferreira (6), and Antonio Ferreira (6)

(1) Universidad de Málaga, Málaga, Spain (jfmmurillo@uma.es), (2) Universidad de La Habana, La Habana, Cuba., (3) Mykolas Romeris Universitetas, Vilnius, Lithuania., (4) Institute of Nature and Forest Research (INBO), Ghent, Belgium. , (5) Helmholtz-Centre for Environmental Research – UFZ, Leipzig, Germany, (6) Research Centre for Natural Resources, Environment and Society (CERNAS), College of Agriculture, Polytechnic Institute of Coimbra, Coimbra, Portugal.

Nature can help provide viable solutions using and deploying the properties of natural ecosystems and the services provided in a smart way. These nature-based solutions provide sustainable, cost-effective, multi-purpose and flexible alternatives for various objectives, especially, more resource efficient, competitive and greener economy (European Commission, 2019). Nature based Solutions may be helpful in urban and periurban areas owing to the scarcity of green areas and the importance of provided human well-being to population. In this sense, mapping ecosystem services is essential to understand how ecosystems contribute to human well-being and to support policies that have an impact on natural resources by means of Nature based Solutions. To do this, remote sensing is widely used for land cover characterization, mapping and monitoring nature from local to global scale. Remote sensing can offer a practical and economical means to study ecological quality of cities based on the specific functions or functional groups/biodiversity, which support the supply of ecosystem services (e.g. habitats for species, maintenance of genetic diversity) .This is because many ecosystem services are ecological processes or the direct products of them. Other ecological processes can have detrimental effects on service supply. Thus, mapping the spatial distribution and the level of ecosystem functionality can provide useful information to the direct mapping or indirect modeling of ecosystem services.
This study deals with the ecological characterization of selected green areas in urban and periurban areas from 4-European cities: Coimbra (Portugal), Ghent (Belgium), Leipzig (Germany), and Vilnius (Lithuania). This ecological characterization was conducting by means of the Normalized Difference Vegetation Index and Ecological Connectivity Index. To do this, images from a GeoEye-1 Satellite sensor (0.5 m of spatial resolution) were used to map land cover and study sites by means of the object-based classification. The results indicate that the study sites provide efficient nature based solutions and ecosystem services are assured when the vegetation cover is well managed in order to maintain the ecological connectivity with other urban green areas as well as other green areas beyond the urban limits.

References

European Commission. 2019. Nature based Solutions. https://ec.europa.eu/research/environment/index.cfm?pg=nbs [Last access: 10/01/19].