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Methodological approach for mapping ecosystem services in urban and suburban areas

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Mapping Ecosystem Services (ES) is essential to understand how ecosystems contribute to human well-being and support policies that impact on natural resources and ecosystems (MEA., 2005). In this regards remote sensing is widely used to characterize, mapping, and monitoring land cover from the local to the global scale (Palacios-Orueta et al., 2012). It is well known a remote sensing sensor is a key device that captures data about an object or scene remotely. Since objects (including land use cover) have unique spectral features (reflectance or emission regions), they can be identified from remote sensing imagery according to this (Petit et al., 2001). In Urban and suburban areas, the technology of 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 ES are ecological processes or directly products by them (MEA., 2005). Other ecological processes can have detrimental effects on service supply. Thus, mapping the spatial distribution and the degree of ecosystem functionality can provide useful information of the service provided by them to the urban population.

Within the framework of the Urbangaia project, the purpose of this study is to bridge present a methodology of ecosystem service related research in ecology and remote sensing in urban areas. Specifically, the study presents a remote sensing-based method for ES potential assessment in four European studies cases- Ghent, Coimbra, Vilnius and Leipzing-. Land cover was used as a proxy measure of ecosystem services because of its multiple linkages to carbon storage, watershed protection, and other types of services. For each land cover type, the services provided by the ecosystem are identified and given a monetary value based on previous studies and original calculations. A GeoEye-1 Satellite Sensor (0.5m spatial resolution) has been used in each study case, for its broad spatial coverage of its images. Several key areas are considered such as land cover, biodiversity, carbon, water and soil related ecosystem service. By the analysis of the different studies cases, the study also gives some global recommendation.

References

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