



## Mapping Urban Ecosystem Services in Coimbra city (Portugal)

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Mapping ecosystem services is essential to understand how ecosystems contribute to human wellbeing and to support policies which have an impact on natural resources. Cities are complex socio-ecological systems, and the needs and desires to improve well-being are highly variable within and between cities and over time. Urbanization provokes fragmentation and degradation: ecological connectivity and ecosystem condition (quantity as well as quality) are heavily affected. This decreases ecological resilience, ecosystem functioning and biodiversity, in turn affecting the supply of ecosystem services (ES) and all potential benefits related to them. The need for resilient and healthy ecosystems, fostering biodiversity and maintaining human wellbeing is particularly pressing in urban contexts where the highest population densities are coinciding with highest environmental impacts.

The aim of this study is to identify areas with high ES potential in Coimbra city. A GeoEye-1 Satellite Sensor (0.5m spatial resolution) has been used for its broad spatial coverage of its images. These satellite images were used to identify different Land Uses types. We identified a total of 18 different land uses (ecological belts, brown sites, natural parks, etc.) that have been grouped according to Green and Blue Infrastructure. The assessment of each land cover potential was carried out using CORINE land cover 2006 validate with an expert assessment. Each land use type was ranked from 0 (no potential) to 5 (High potential). In this work the sum of total regulating, providing and cultural ES were assessed. The areas with optimal ES were the ones with the sum of all ranks equal or higher than the 3rd Quartil of each distribution. After identifying these areas, data was mapped using ArcGIS software. The results suggested that ES regulating, providing and cultural ES are located in specific regions, and according to optimal areas assessment, an important area of Coimbra had high potential to provide very good ES. These results are important for a better planning of these areas in order to maintain the quality of these services. Thus, 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).