

# 城市森林生态系统服务功能评价指标与方法

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**摘要:** 【目的】城市森林是以改善城市生态环境为主, 促进人与自然协调, 满足社会发展需求的森林生态系统。但是目前城市森林生态系统服务评估研究与实践大多数是基于传统森林生态系统服务功能评估方法, 未能体现出城市森林生态系统特点。因此, 需要研究提出具有中国城市发展特色及符合社会发展需求的城市森林生态系统服务功能评价指标体系, 制定科学的评估方法。使得评估结果能够为各个城市森林利益相关者感知, 能够提升政府及公众对城市森林建设的重视程度, 能够反补促进城市森林可持续建设和发展。【方法】城市森林生态系统服务, 是指人类从城市森林生态系统中获得的各种惠益。而城市森林生态系统服务评估, 是利用城市森林生态系统地面调查和观测数据、遥感数据、基础地理信息数据、文献资料和公共数据, 对城市森林生态系统提供的各种服务进行数值或功能量的评估。本研究围绕城市森林生态系统发挥的主要作用、公众服务的主要需求和政府关注的主要问题, 根据《城市生态系统定位观测指标体系》(LY/T 2990-2018)、《国家森林城市评价指标》(GB/T 37342-2019)、《森林生态系统服务功能评估规范》(GB/T 38582-2020)、《中国森林城市建设综合成效监测评估指标体系及方法》、《森林资源资产价值评估技术规范》(DB11/T 659-2018) 等文件以及公众需求调查问卷、城市生态系统服务评估文献等资料分析, 制定城市森林生态系统服务功能指标体系和评估方法。【结果】指标体系共设置了 8 个一级指标、31 个二级指标。一级指标分别是生态安全服务、生物多样性服务、净化环境服务、降温节能服务、居民健康服务、绿视景观服务、生态文化服务、经济就业服务。二级指标均明确了彰显城市森林生态系统特色的服务含义。在评估方法部分, 对每个二级指标均设定了可量化的数值或功能量变量, 提高可操作性, 比如二级服务指标生态系统稳定性提升, 设定了乡土树种比重、单一树种使用量两个变量。【结论】城市森林生态系统服务功能评估是一个重要而又没有框架限定的命题研究, 本文依据城市森林规划、建设、管理及公众感知等研究和实践基础, 提出了城市森林生态系统服务评估指标与方法, 以期凸显中国城市森林建设特色成效, 形成城市森林建设久久为功的社会共识。

**关键词:** 城市森林; 生态系统服务; 评价指标体系; 评价方法

## Indicators and evaluation methods for urban forest ecosystem services

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**Abstract:** 【Objective】Urban forest is a forest ecosystem that focuses on improving the urban ecological

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environment, promoting coordination between humans and nature, and meeting the needs of social development. However, most of the current research and practice on urban forest ecosystem service evaluation are based on traditional forest ecosystem service evaluation methods, which fail to reflect the characteristics of urban forest ecosystems. Therefore, it is necessary to study and propose an evaluation index system for urban forest ecosystem services that has Chinese urban development characteristics and meets social development needs, and develop scientific evaluation methods. Importantly, the evaluation results could be perceived by various urban forest stakeholders. Therefore, the results can enhance the government and public's attention to urban forest construction, and can complement and promote sustainable construction and development of urban forests. **【Method】** Urban forest ecosystem services refer to the various benefits that humans derive from urban forest ecosystems. The evaluation of urban forest ecosystem services is a numerical or functional evaluation of various services provided by urban forest ecosystems using ground survey and observation data, remote sensing data, basic geographic information data, literature materials, and public data. Focusing on the main role played by urban forest ecosystem, the main needs of public services and the main issues concerned by the government, this study develop the urban forest ecosystem service function index system and evaluation methods. The main references are "Long-term observation indicators for urban ecosystem" (LY/T 2990-2018), "Indicators for national forest city assessment" (GB/T 37342-2019), "Specifications for assessment of forest ecosystem services" (GB/T 38582-2020), "The index system and method for monitoring and evaluating the comprehensive effectiveness of China's forest city construction", "Technical specifications for valuation of forest resource assets" (DB11/T 659-2018) and other documents, as well as the public demand questionnaire, the Urban ecosystem service evaluation literature. **【Result】** The indicator system consists of 8 primary indicators and 31 secondary indicators. The first level indicators are ecological security services, biodiversity services, environmental purification services, cooling and energy conservation services, resident health services, green landscape services, ecological and cultural services, and economic employment services. The secondary indicators clearly define the service meaning that highlights the characteristics of urban forest ecosystems. In the evaluation method section, quantifiable numerical values or functional variables were set for each secondary indicator to improve operability, such as improving the stability of the secondary service indicator ecosystem, setting two variables: the proportion of local tree species and the usage of single tree species. **【Conclusion】** The evaluation of urban forest ecosystem service is an important and frameless research topic. Based on research and practical foundations such as urban forest planning, construction, management, and public perception, this article proposes evaluation indicators and methods for urban forest ecosystem services, in order to highlight the unique achievements of China's urban forest construction and form a social consensus that urban forest construction has been a long-term success.

**Key words:** urban forest; ecosystem services; evaluation index system; evaluation methods.