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Applications of TLS and ALS in Evaluating Forest Ecosystem Services: A Southern Carpathians Case Study

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摘要 Forests play an important role in biodiversity conservation, being one of the main providers of ecosystem services, according to the Economics of Ecosystems and Biodiversity. The functions and ecosystem services provided by forests are various concerning the natural capital and the socio-economic systems. Past decades of remote-sensing advances make it possible to address a large set of variables, including both biophysical parameters and ecological indicators, that characterize forest ecosystems and their capacity to supply services. This research aims to identify and implement existing methods that can be used for evaluating ecosystem services by employing airborne and terrestrial stationary laser scanning on plots from the Southern Carpathian mountains. Moreover, this paper discusses the adaptation of field-based approaches for evaluating ecological indicators to automated processing techniques based on airborne and terrestrial stationary laser scanning (ALS and TLS). Forest ecosystem functions, such as provisioning, regulation, and support, and the overall forest condition were assessed through the measurement and analysis of stand-based biomass characteristics (e.g., trees' heights, wood volume), horizontal structure indices (e.g., canopy cover), and recruitment-mortality processes as well as overall health status assessment (e.g., dead trees identification, deadwood volume). The paper, through the implementation of the above-mentioned analyses, facilitates the development of a complex multi-source monitoring approach as a potential solution for assessing ecosystem services provided by the forest, as well as a basis for further monetization approaches. [View Full-Text](#)

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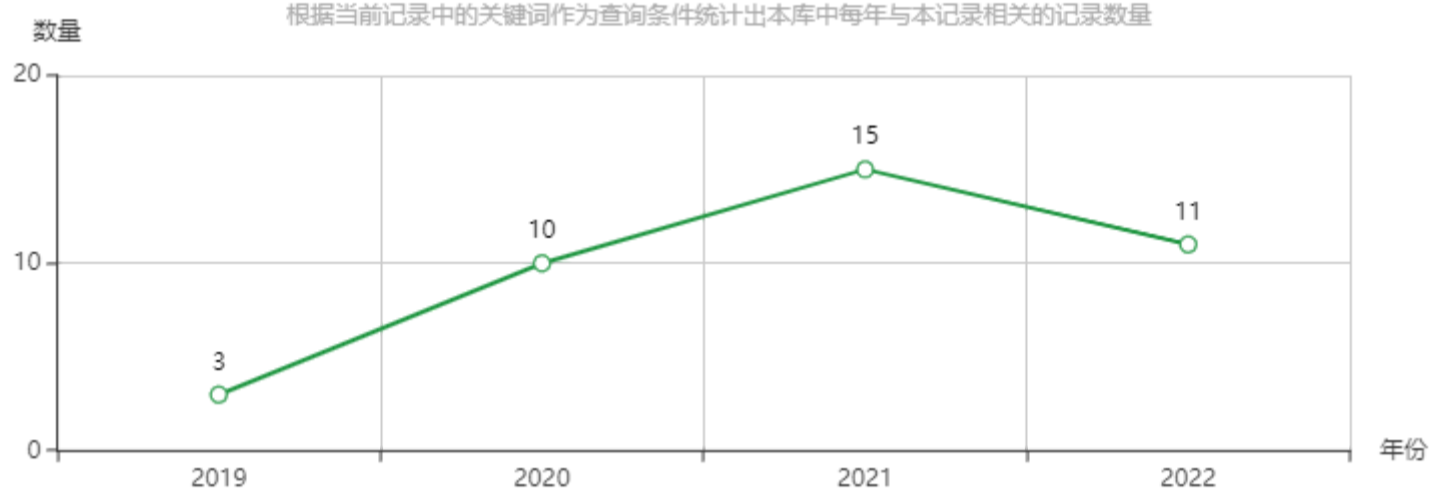
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