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## The Utility of Sentinel-2 Spectral Data in Quantifying Above-Ground Carbon Stock in an Urban Reforested Landscape

编号	030031402
推送时间	20211025
研究领域	<a href="#">森林经理</a>
年份	2021
类型	期刊
语种	英语
标题	The Utility of Sentinel-2 Spectral Data in Quantifying Above-Ground Carbon Stock in an Urban Reforested Landscape
来源期刊	REMOTE SENSING
期	第314期
发表时间	20211025
关键词	<a href="#">reforestation</a> ; <a href="#">ecosystem services</a> ; <a href="#">carbon stock</a> ; <a href="#">random forest</a> ;
摘要	The transformation of the natural landscape into an impervious surface due to urbanization has often been considered an important driver of environmental change, affecting essential urban ecological processes and ecosystem services. Continuous forest degradation and deforestation due to urbanization have led to an increase in atmospheric carbon emissions, risks, and impacts associated with climate change within urban landscapes and beyond them. Hence, urban reforestation has become a reliable long-term alternative for carbon sink and climate change mitigation. However, there is an urgent need for spatially accurate and concise quantification of these forest carbon stocks in order to understand and effectively monitor the accumulation and progress on such ecosystem services. Hence, this study sought to examine the prospect of Sentinel-2 spectral data in quantifying carbon stock in a reforested urban landscape using the random forest ensemble. Results show that Sentinel-2 spectral data estimated reforested forest carbon stock to an RMSE between 0.378 and 0.466 t·ha <sup>-1</sup> and R <sup>2</sup> of 79.82 and 77.96% using calibration and validation datasets. Based on random forest variable selection and backward elimination approaches, the red-edge normalized difference vegetation index, enhanced vegetation index, modified simple ratio index, and normalized difference vegetation index were the best subset of predictor variables of carbon stock. These findings demonstrate the value and prospects of Sentinel-2 spectral data for predicting carbon stock in reforested urban landscapes. This information is critical for adopting informed management policies and plans for optimizing urban reforested landscapes carbon sequestration capacity and improving their climate change mitigation potential.
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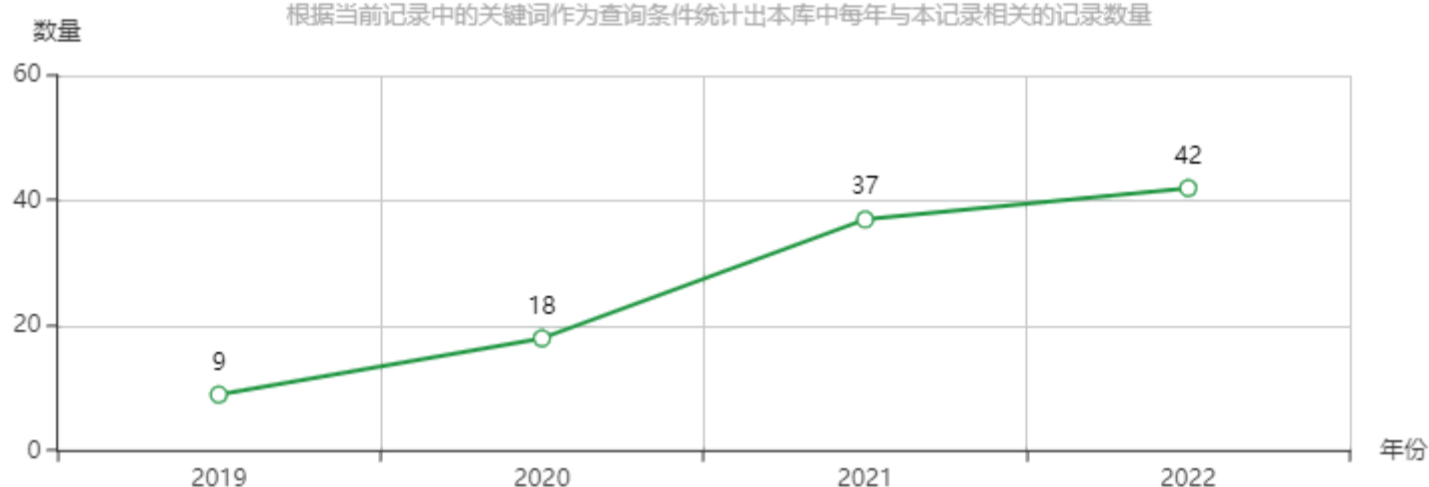
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