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The Carbon Neutral Potential of Forests in the Yangtze River Economic Belt of China

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摘要 Prediction of forest carbon sink in the future is important for understanding mechanisms concerning the increase in carbon sinks and emission reduction, and for realizing the climate goals of the Paris Agreement and global carbon neutrality. Based on stand volume data of permanent monitoring plots of the successive national forest inventories from 2004 to 2018, and combined with multiple variables, such as climatic factors, soil properties, stand attributes, and topographic features, the random forest algorithm was used to predict the stand volume growth-loss and then calculated the forest biomass and its carbon sink potential between 2015 to 2060 in the Yangtze River Economic Belt of China. From 2015 to 2060, the predicted forest biomass carbon storage and density increased from 3053.27 to 6721.61 Tg C and from 33.75 to 66.12 Mg C hm⁻², respectively. The predicted forest biomass carbon sink decreased from 90.58 to 73.98 Tg C yr⁻¹, and the average forest biomass carbon storage and sink were ranked in descending order: Yunnan, Sichuan, Jiangxi, Hunan, Guizhou, Hubei, Zhejiang, Chongqing, Anhui, Jiangsu, and Shanghai. The forest biomass carbon storage in the Yangtze River Economic Belt will increase by 3.67 Pg C from 2015 to 2060. The proportion of forest C sinks on the regional scale to C emissions on the national scale will increase from 2.9% in 2021–2030 to 4.3% in 2041–2050. These results indicate higher forest carbon sequestration efficiency in the Yangtze River Economic Belt in the future. Our results also suggest that improved forest management in the upper and middle reaches of the Yangtze River will help to enhance forest carbon sink in the future. View Full-Text

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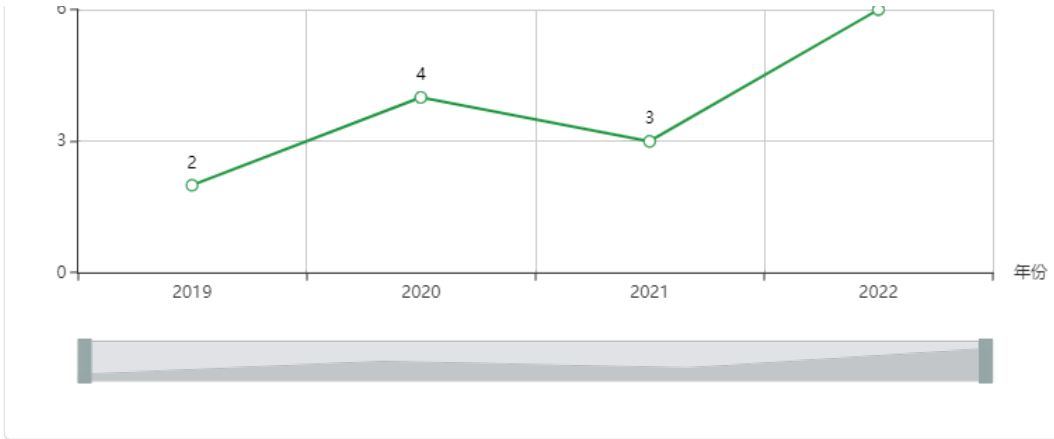
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