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长白山林区森林生物量变化定量驱动分析

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Quantitative driving analysis of forest biomass changes in Changbai Mountain forest region.

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摘要

根据研究区单木生物量模型及森林资源清查资料计算样地生物量,采用试验精度较高的遥感模型进行4期遥感数据的森林生物量估算,获得区域单位面积生物量变化值,并利用bootstrap方法对引起这种变化的气象因素、森林经营活动因素和社会经济因素等驱动因子进行变量筛选，利用偏最小二乘算法建立不同时间段的森林生物量变化驱动模型，计算变量投影重要性指标（VIP）定量刻画各因素对森林生物量变化的影响重要程度.结果表明：目前人为因素对长白山林区森林生物量变化的影响程度（VIP值）已经小于自然因素，说明国家对林区的森林保护政策已经起到了明显的效果.本文拓宽了森林生物量变化驱动分析的内容，引入了VIP值对森林生物量的变化驱动因子进行定量刻画，为定量分析森林生物量的变化提供了一条新的途径.

关键词： 森林生物量 定量分析 VIP值

Abstract:

Based on the forest inventory data and single tree biomass model, the forest biomass in the sampling plots in Changbai Mountain forest region was calculated, and, by using the estimated forest biomass from four periods’ remote sensing data and based on high accuracy remote sensing models, the changes of regional forest biomass were analyzed. In the meanwhile, the driving factors such as meteorological factors, management factors, and socio-economic factors that caused forest biomass change were selected by bootstrap method, and the driving model of forest biomass change in different time period was set up by using partial least-squares method. The Variable Importance in Projection (VIP) values representing the importance of each of the factors affecting the forest biomass change in study region were calculated. The results showed that the influence of human activity factors (VIP values) on Changbai Mountain forest biomass changes was less than that of natural factors, suggesting that the national forest protection policy for forest regions had played an obvious role. Our research broadened the content of forest biomass change driving analysis, and the introduction of calculating VIP value, which can quantitatively represent the influence of driving factors to forest biomass change, provided a new way for the quantitative analysis on forest biomass change.

Key words: forest biomass quantitative analysis VIP value

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