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## Classifying Individual Shrub Species in UAV Images—A Case Study of the Gobi Region of Northwest China

编号 030032101

推送时间 20211213

研究领域 [森林经理](#)

年份 2021

类型 期刊

语种 英语

标题 Classifying Individual Shrub Species in UAV Images—A Case Study of the Gobi Region of Northwest China

来源期刊 REMOTE SENSING

期 第321期

发表时间 20211208

关键词 [shrub species classification](#); [unmanned aerial vehicle](#); [RGB image](#); [object-based image analysis](#); [spectral indices](#); [texture indices](#);

**摘要** Shrublands are the main vegetation component in the Gobi region and contribute considerably to its ecosystem. Accurately classifying individual shrub vegetation species to understand their spatial distributions and to effectively monitor species diversity in the Gobi ecosystem is essential. High-resolution remote sensing data create vegetation type inventories over large areas. However, high spectral similarity between shrublands and surrounding areas remains a challenge. In this study, we provide a case study that integrates object-based image analysis (OBIA) and the random forest (RF) model to classify shrubland species automatically. The Gobi region on the southern slope of the Tian Shan Mountains in Northwest China was analyzed using readily available unmanned aerial vehicle (UAV) RGB imagery (1.5 cm spatial resolution). Different spectral and texture index images were derived from UAV RGB images as variables for species classification. Principal component analysis (PCA) extracted features from different types of variable sets (original bands, original bands + spectral indices, and original bands + spectral indices + texture indices). We tested the ability of several non-parametric decision tree models and different types of variable sets to classify shrub species. Moreover, we analyzed three main shrubland areas comprising different shrub species and compared the prediction accuracies of the optimal model in combination with different types of variable sets. We found that the RF model could generate higher accuracy compared with the other two models. The best results were obtained using a combination of the optimal variable set and the RF model with an 88.63% overall accuracy and 0.82 kappa coefficient. Integrating OBIA and RF in the species classification process provides a promising method for automatic mapping of

individual shrub species classification.

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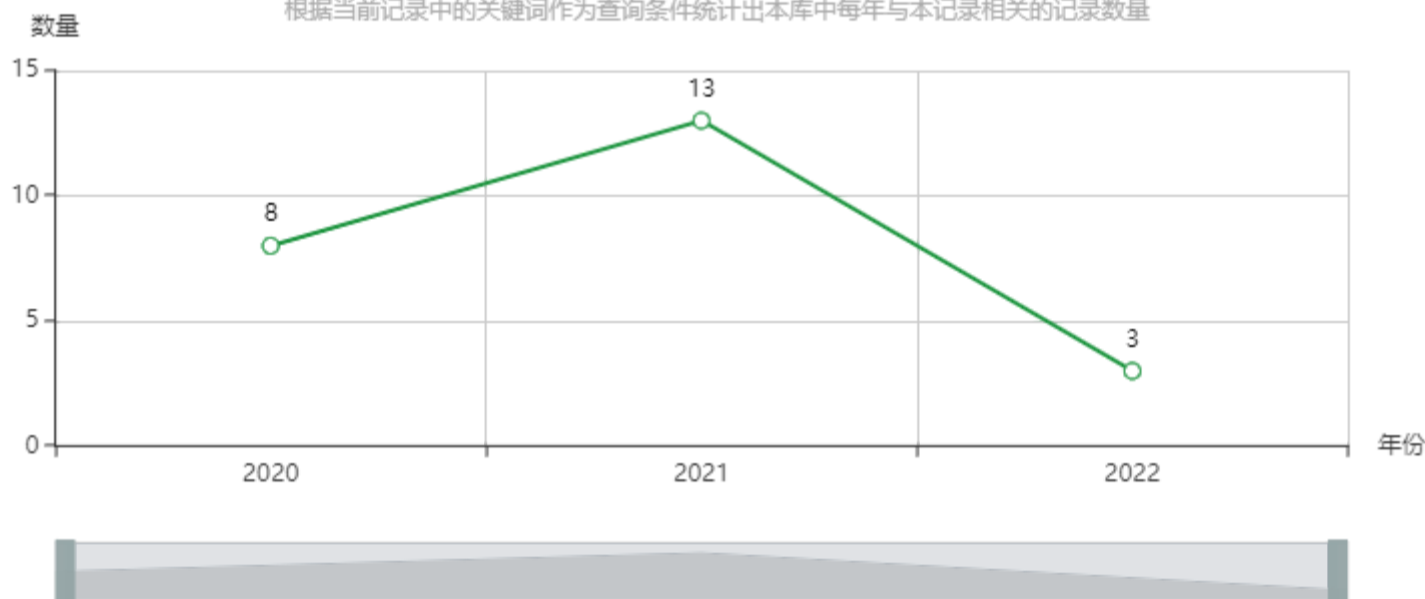
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