

基于MODIS数据的水稻种植面积提取研究进展

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Advances in rice planting area extraction technology based on MODIS data

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摘要 概述了水稻种植面积监测遥感数据源的应用变化、特征指数和时相选取以及遥感分类方法的发展,分析了MODIS影像在水稻种植面积遥感提取技术方面的研究进展及发展方向。结果表明:MODIS具有高光谱、高时间分辨率、多时相等特点,在大尺度上提取水稻种植面积上,可提高作物识别和监测的精确度与工作效率,节约成本,有着其他遥感数据无法相比的优势,应用MODIS数据提取水稻种植面积,取得了较好的效果。水稻遥感的最佳时相可以选择移栽期和孕穗期,利用对水体和植被较为敏感的波段或植被指数(如NDVI、LSWI和EVI)进行水稻识别,并提取种植面积。传统的遥感图像分类方法如监督分类和非监督分类,算法成熟、操作简单,是目前应用较多的方法;近年来发展起来的分类新方法,如决策树分类法、专家系统分类法、神经网络分类法,支持向量机法等,能够更准确地提取目标地物,对图像分类有不同程度的改进,在实际应用中通常和传统分类方法结合起来使用;多时相分析法与高时间、高分辨率多光谱影像的结合可以获取较高精度的作物种植面积数据,与传统分类方法相比有较大提高。利用MODIS对单一的或大面积的水稻种植面积提取效果较好,但对于地块破碎的种植面积估算尚难达到满意的结果,添加其他的辅佐数据如高程、坡度等,并结合MODIS数据的多时相特点分类等方法,可提高遥感影像分类的精度。

关键词: [水稻](#) [种植面积](#) [MODIS数据](#) [遥感](#) [多时相](#)

Abstract: The changes of remote sensing data source, character index and temporal selection of remote sensing data and the development of remote sensing classification methods were summarized. The advances and development direction of applying MODIS image to extraction of the rice planting area were analyzed. The results indicate that MODIS data have many advantages such as high spectral, and temporal resolution, multi-temporal, cost savings compared with other remote sensing data, and it can improve the identification and monitoring accuracy and efficiency in rice planting area estimation in a large scale area. Application of MODIS data in rice planting area estimation has achieved good effects. The rice is identified and the planting area is extracted using the spectral bands sensitive to water bodies and vegetation or vegetation indices such as NDVI, LSWI and EVI and so on. Thus, the optimum time extracting rice planting area should be the transplanting period and booting stage of paddy. The traditional classification methods such as supervised classification and unsupervised classification are simple and are widely used. The new method developed recently could improve the accuracy of classification, such as decision tree, expert system, neural network and support vector machine methods that can extract the target objects more accurately. In the practical application, these methods are usually used in combination with traditional classification methods. The multi-temporal analysis method combines with high time, high resolution and high multi-spectral image in order to get crop planting area in a higher precision. Compared with the traditional method, the effect of classification improves greatly. For single or large rice planting area, the accuracy of rice planting area extraction is higher based on

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MODIS data, while it is lower for fragile plots. The accuracy could be improved if the additional data such as elevation and slope etc. are added and the multi-temporal classification methods are combined.

Keywords: [Rice](#), [Planting area](#), [MODIS data](#), [Remote sensing](#), [Multi-temporal](#)

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