农业信息

基于时序MODIS-EVI数据的冬小麦种植信息提取

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摘要：

【研究目的】准确获取作物种植空间分布和面积信息是进行粮食估产的重要前提条件，也是调整种植结构的重要数据基础。【方法】笔者以河北省2004——2005年整个作物生育期内35个时相的合成地表反射率数据为数据源，生成时间序列MODIS-EVI数据集，在利用Savitzky-Golay滤波重构时序MODIS-EVI数据的基础上，分析作物EVI时间曲线，结合作物种植结构和物候历，构建分类模型，提取2004年主要种植作物的种植空间分布及面积信息。【结果】Savitzky-Golay滤波能够有效地消除云和缺失数据的影响，同时基本上保持原有曲线的基本形状，较为真实地恢复植被指数曲线。与统计数据相比，各市分类精度相差较大，其中邯郸的分类精度最低（85.9%），沧州精度最高，达到99%。按全省计算，整体精度为95.7%。2004年，河北省冬小麦呈明显的地带性，主要分布在邯郸东南部、邢台和石家庄中部以及保定东部。【结论】利用时间序列MODIS-NDVI数据提取大区域作物种植空间分布信息是可行的。

关键词： 时间序列；MODIS-EVI；冬小麦；分类

Planting Information Extraction of Winter Wheat Based on the Time-Series MODIS-EVI

Abstract:

【OBJECTIVE】It is important to get the accurate information of crop spatial distribution and areas for yield assessment and crop pattern optimization. 【METHOD】In this research, time-series MODIS-NDVI was used to improve the accuracy of winter wheat classification. MODIS reflectivity data was used to calculate NDVI firstly. The Savitzky-Golay smooth filter has been developed to reduce the noise and enable the reconstruction of high quality MODIS-NDVI time-series. Based on the reconstructed MODIS-NDVI, as well as crop phenology, a simple but reasonable model was built to distinguish winter wheat classification in Hebei province. 【RESULTS】The result showed that the Savitzky-Golay smooth filter model can eliminate efficiently the cloud contaminated data and abnormal data in time-series VI data, and the reconstruct data can capture the crop time profile curve better. There was a notable difference for the classification accuracy between counties. The lowest was 85.9% for Handan county, and the highest was 99% for Cangzhou county. The total accuracy of winter wheat for Hebei province was over 95%. The distribution of winter wheat in Hebei province in 2004 has the distinct features of zonality, it distributed mainly over southeastern Handan, Xintai, central Shijiazhuang and eastern Baoding. 【CONCLUSION】It was possible to extract planting spatial distribution information of winter wheat by using time-series MODIS-NDVI data for large areas. The accuracy also showed the results were high in reliability especially in plain areas.

Keywords: time-series MODIS-EVI winter wheat classification

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