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Title:	Extract of MODIS snow accumulation information in north Xinjiang using combined hard and soft classification method

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统计/STATISTICS

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摘要： 积雪是影响新疆水资源管理和季节性洪水灾害的重要因素,对气候环境变化的响应非常敏感,积雪信息是模拟预测积雪融水的基础参数.针对利用MODIS数据提取积雪丰度信息精度较低的问题,提出将MODIS影像分割为纯净像元部分和混合像元部分,分别利用支持向量机(SVM)和线性光谱混合模型(LSMM)分类再组合的方法,并与单独使用SVM和LSMM分类的方法进行精度对比分析.结果表明:该方法的决定系数为0.846,比软分类的LSMM方法提高了5.2个百分点,比硬分类的SVM方法提高了3.4个百分点;均方根误差(RMSE)为0.177,比SVM方法提高了0.034,比LSMM方法提高了0.016.因此,软硬分类结合的方法能够在一定程度上克服了各自的缺点,有效提高MODIS数据积雪丰度提取的精度和效率,并且图像质量亦有所提高.

Abstract: Accumulated snow is an important factor to affect the water resource management and seasonal floods in northern Xinjiang region, and the snow cover is the basic parameters of the simulation and prediction of melted snow water. In view of the problem that the accuracy to extract the snow accumulation abundance information using MODIS data is low, this paper proposed to split the MODIS images into pure pixel part and mixed-pixel part, reclassify using the support vector machine (SVM) and linear spectral mixture model (LSMM), and then combine the two parts. Then an accuracy comparative analysis was conducted with respective to the separated classification method of SVM and LSMM. Results show that, the coefficient of determination of the new method is

0.846, which increased by 5.2 percent than the soft classification method (LSMM) and increased by 3.4 percent than the hard classification (SVM) method; the root mean square error (RMSE) is 0.177, which is 0.034 higher than the SVM method and 0.016 higher than the LSMM method. Therefore,the combination of hard and soft classification could overcome the disadvantages of the separate methods to some extent, effectively improve the accuracy and efficiency of MODIS data usage in the extraction of snow accumulation abundance, and also improve the image quality.

参考文献/REFERENCES

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更新日期/Last Update: 1900-01-01