

研究报告

遥感数据支持下不同地表覆盖的区域蒸散

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摘要 将地表能量平衡系统(SEBS)扩展成遥感日蒸散估算模型,利用MODIS遥感数据估算了黄淮海地区的区域蒸散,并在地理信息系统的支持下分析了不同地表覆盖下的区域蒸散统计分布特征.在缺乏各地表覆盖类型相应蒸散量实测值进行对比的情况下,以2001年4月17日估算的日蒸散量为例,通过各地表覆盖类型日蒸散量间的相互对比分析表明,SEBS估算的区域日蒸散量具有一定的合理性.分析结果表明:在黄淮海地区,荒地具有最低的蒸散量;森林、灌木、草地等地表覆盖类型具有中等的蒸散量;而水体、湿地以及耕地具有较高的蒸散量.可能由于包含绿地和水面,城镇用地的蒸散量也较高.土壤含水量的空间差异性导致森林、灌木、草地和耕地等地表覆盖类型的蒸散量具有明显的空间差异性.耕地蒸散量的空间差异性可以为制定合理、高效的农田灌溉计划提供指示作用. SEBS遥感日蒸散模型的局限性在于有可能低估水体和湿地等地表覆盖类型的蒸散量.

关键词 [蒸散](#) [遥感](#) [地理信息系统](#) [黄淮海地区](#)

分类号

Regional evapotranspiration of different land covers based on remote sensing

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Abstract

In this paper, surface energy balance system (SEBS) was extended into a regional daily evapotranspiration (*ET*) estimation model based on remote sensing data, and the extended SEBS was applied to estimate the regional daily *ET* of Huanghe-Huaihe-Haihe rivers region in Northern China Plain by using MODIS/TERRA data. An analysis was made on the estimated daily *ET* characteristics of different land covers in the study area by using the spatial analysis module of ArcGIS. Since there were no field observations of *ET* on each land cover, the estimated daily *ET* of different land covers was compared with each other, taking the data on April 17, 2001 as an example. The results showed that the regional daily *ET* estimated by SEBS was reasonable. Wetland and cultivated land had the highest daily *ET* value, followed by forest-, bush- and grassland, and waste land. The characteristics of the daily *ET* over these land covers were accorded with the existing knowledge of *ET* over this region, and coincident to the results of previous work in this area. It was interesting that the residential area also had a higher *ET* value, which was explained as the higher *ET* of the land use types, *e. g.*, water body, street trees, and grass parcels in the residential areas within the pixel scale. The spatial inhomogeneity of *ET* among the forest-, bush-, grass- and cultivated land covers were caused by the spatial inhomogeneous soil water content under these land covers, and the spatial inhomogeneity of *ET* over cultivated land could be a potential indicator of making reasonable and effective irrigation schedule for the farmland. The limitations of using SEBS model in daily *ET* estimation were discussed, especially the possibility of underestimating the *ET* over water body

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and wetland covers due to the unsuitable surface parameterization scheme for these land types in the model.

Key words [evapotranspiration](#) [remote sensing](#) [geographic information system](#)
[Huanghe-Huaihe-Haihe rivers region](#)

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