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基于蒸散发模型的定量遥感缺水指数

**Quantitative remote sensing of water deficit index based on evapotranspiration**

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英文关键词: [evapotranspiration](#) [soil moisture](#) [models](#) [component temperature](#) [water deficit index](#)

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中文摘要:

该文针对西北地区存在着严重的缺水问题,以黑河中游区域范围内的张掖市内的盈科绿洲及荒漠为研究对象,运用ASTER卫星遥感数据,根据地表能量平衡原理,建立作物缺水指数模型。在前人研究基础上,对缺水指数模型涉及的2个参数进行了改进:1)在植被覆盖区,利用半干旱地区基于亚象元的土壤蒸发和植物蒸腾双层模型,剥离土壤的影响,获取缺水指数模型中的植被潜热通量;2)为了更精确地提取地表信息,利用遗传算法对该区进行混合像元分解,获取模型中的地表组分温度参量。通过地表缺水指数估算干旱半干旱区土壤含水率,模拟结果与地表同步实测值土壤水比较,误差精度分布在2.17%~3.58%,表明该方法是可行的。

英文摘要:

Water shortage is already a serious problem in arid North-west China. As an indicator of water shortage, a new surface water deficit index to estimate soil moisture content from optical and thermal spectral information of ASTER imagery based on the surface energy balance was presented in this paper. Compared to models published previously, two improvements have been made: 1) In the vegetation area, to strip effectively the impact of surface soil, the series two-layer was applied to acquiring vegetation latent heat flux parameter in the surface water deficit index model; 2) Because most pixels in the ASTER image are mixed and consist of different types of land cover, to meet the practical needs of a quantitative remote sensing study, genetic inverse algorithm (GIA) was used to realize retrieval of component temperature parameter in the surface water deficit index model. Taking Yingke green land in China for example, field experiments were carried out to validate the developed model. Comparing simulated soil water retrieved by surface water deficit index model with field measured data, the experimental results show that the new method is feasible, which can provide a new way of thinking for retrieval of soil moisture.

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