Estimation and Analysis of Regional Evapotranspiration in the eastern province of China with Remote Sensing data

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Evapotranspiration (ET) is a critical component of the land surface energy balance system and hydrologic processes. Analysis of spatiotemporal variations and influencing factors of ET is of great importance to evaluate the growing environment for crops and to effectively use water resources, a critical base for production in research region. The traditional methods are based on point measurement, while the remote sensing provides extensive surface information. The development of remote sensing has promoted the study of regional ET. SEBAL model is based on Surface Energy Balance Algorithm for Land and its physical meaning is clear. This model was developed to show the spatial variability of surface evapotranspiration. SEBAL model was capable of being applied to large regional areas in conjunction with Moderate-resolution Imaging Spectroradiometer (MODIS) data products. According to the shortcomings of the traditional method of calculating ET, based on SEBAL model, the daily regional evapotranspiration of Anhui Province was estimated with 1 km spatial resolution by using MODIS products and a few of meteorological data (temperature, wind speed) collected in meteorological stations distributed over the study area. Because of lacking observed data from the lysimeter, the results of P-M were compared with the estimation results based on SEBAL model in this research. The comparison of the evapotranspiration estimated with MODIS products and field observation showed that the former results were lower than the latter results on the whole, and demonstrated that there existed certain trend in correlation between the two results, the average relative error was different at different land surface. The ET computation method based on Remote Sensing proves that this model has strong practicality in Anhui, and it will show great potential in this field with more optimizing the model parameters.