**Modelling evapotranspiration with two different models using remote sensing data**

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The increasing interest of hydrological, climatic and meteorological models in the different components of the surface energy balance has encouraged the development of operational methods for estimating surface energy fluxes. Many different remote sensing-based models have been emerged in recent years. In this study, daily actual evapotranspiration of a sub-basin of Taoer river basin in Northeast China was estimated based on the Surface Energy Balance System (SEBS) and Series Two-Source Energy Balance (S-TSEB) model. An intercomparison of estimates from the single-source model and the two-source model using MODIS and TM data was conducted to examine their utilities and limitations under different land covers. A major difference between the two models is whether the soil and vegetation components of the scene are treated separately (Two-Source Energy Balance; TSEB approach) or as a lumped composite (one-source approach; Surface Energy Balance System for Land; SEBS) in the parameterization of radiative and turbulent exchanges with the overlying air.

The evapotranspiration (ET) estimated from satellite data in this study for the whole watershed was validated by Penman–Monteith approaches and the rationality of the calculation result based on the MODIS date is compared against the result of the SEBS model based on TM data. In general, all the results show reasonable agreement, while some discrepancies exist. The analysis of S-TSEB and SEBS sensitivity to uncertainties in primary inputs was conducted, and a further study suggests that some of the simplifying assumptions in SEBS and S-TSEB may not be strictly applicable over the wide range in conditions present within these landscapes. Overall, using different type of models and different source of data, the results from this paper indicate much potential toward routine prediction of surface heat fluxes using remote sensing data.

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