

Monitoring of water resources using satellite information: Applications of MOD16 evapotranspiration

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ABSTRACT

The paper describes four years of research on development and testing of evapotranspiration (ET) using MOD16 ET satellite-derived data. A slight decreasing trend in MOD16 ET was observed over the last 13 years in all climatic regions except in the Southern part of South Africa (winter rainfall areas). Average ET for the whole country (2000-2012) was estimated to be 303 mm/a or $481.4 \times 10^9 \text{ m}^3/\text{a}$ (14% of potential evapotranspiration and 67% of rainfall), mainly in the form of plant transpiration (53%) and soil evaporation (39%). Assuming an average rainfall of 450 mm/a, and considering current best estimates of runoff (9% of rainfall), groundwater recharge (5%) and water withdrawal (2%), MOD16 ET estimates were about 15% short of the water balance closure in South Africa. The ET algorithm is improved to account for soil water supply limiting conditions and for applications in sustainable management of water resources using hydrological models.