

A MODEL FOR SITE SPECIFIC ESTIMATION OF THE AVAILABLE SOIL WATER CONTENT AND THE EVAPOTRANSPIRATION IN FOREST ECOSYSTEMS

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ABSTRACT

A vertical water balance model is presented which calculates a set of different water balance parameters (evapotranspiration, interception, runoff and soil water content) for various land covers and in particular for forest stands as daily values. The model is suitable for site specific calculations as well as for regional and large scale estimation. Climatic input data are readily available from weather services. Texture and structure of soils and rooting depth are assessed from soil profiles, while standardized crop and forest stand information characterize the land cover. The HyMo model was validated with continuously measured soil water content data, as well as with lysimeter data over several years in different forest stands and for different crops. Other validations were done with measured runoff data for two catchment areas. A good agreement between simulated and measured data with deviations that are all smaller than 10% gives evidence for its suitability. Results of water balance calculations for beech and spruce stands in Southern Germany are presented. Additionally, examples show that HyMo is a powerful tool for dendroecological analyses because the retrospective estimation of different water balance parameters is possible.

Reference: Rötzer, T., C. Dittmar, and W. Elling ; A Model for Site Specific Estimation of the Available Soil Water Content and the Evapotranspiration in Forest Ecosystems, Journal of Environmental Hydrology, Vol. 12, Paper 7, May 2004.

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