



Evapotranspiration patterns in the Elbe River basin – Validating the eco-hydrological model SWIM by remotely sensed surface temperatures

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Remotely sensed daytime surface temperatures typically exceed air temperature measurements 2 m above ground. Surface observations from space are limited to clear sky conditions, and the direct solar radiation generates surface temperature patterns depending on the energy partitioning in sensible and latent heat. These patterns strongly (anti-)correlate to local evapotranspiration (ET) and land use type, but are still controlled by the governing air mass.

While many attempts have been made to calculate actual ET from satellite data alone, this study aims to combine NOAA-AVHRR and ground measured data to provide ET maps for the Elbe River basin.

Actual ET maps are also calculated by the eco-hydrological model SWIM. This model, some years ago derived from SWAT, has been applied to 132 000 km² of the Elbe River basin which covers about 150 000 km² in central Europe. The area is divided into 46 515 hydrotopes, specific combinations of subbasin, soil profile and land use type. All hydrological processes including plant growth are simulated for each hydrotope on a daily timestep.

Comparing NOAA-AVHRR derived ET maps with the corresponding SWIM outputs provides an additional way of validating the model especially in sub-regions without gauge measurements.