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WAsP Engineering in the forest

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Required input into WAsP Engineering is a roughness map, which is created from a land use map. We use three different types of parameterisations: (i) WAsP standard parameterisation for forest (automated input), (ii) a model for forest roughness and displacement height (Raupach 1994, Raupach 1995, Verhoef et al. 1997) as well as (iii) parameters estimated from mast measurements at the sites. The results of the three different parameterisations are discussed.

Due to the high forest roughness, the wind profile is relatively steep over forest. We also show how the high values of shear leads to requirements of very tall turbines in order to meet criteria from the standard IEC61400-1.

Raupach MR, 1994: Simplified expressions for vegetation roughness length and zero-plane displacement height as functions of canopy height and area index (research note). *Boundary-layer Meteorology*, **71**:211-216.

Raupach MR, 1995: Corrigenda. *Boundary-layer Meteorology*, **76**: 303-304.

Verhoef A, McNaughton KG, Jacobs AFG, 1997: A parameterization of momentum roughness length and displacement height for a wide range of canopy densities. *Hydrology and Earth System Sciences*, **1**:81-91.