



A comparison of the flow systems of some bogs in the Irish Midlands and East Estonia

S. van der Schaaf

Wageningen University, Department of Environmental Sciences, Soil Physics, Ecohydrology and Groundwater Management Group, The Netherlands. (sake.vanderschaaf@wur.nl / phone: +31-317-482878)

In the acrotelm of a raised bog, the horizontal hydraulic gradient is approximately equal to the surface slope. Hence discharge depends on transmissivity only. Transmissivity is a function of the strong downward decrease of hydraulic conductivity in the acrotelm and the fluctuating water level.

If flow is restricted to the acrotelm itself, bog discharge is proportional with acrotelm transmissivity. At large flow rates, the acrotelm may become unable to develop a sufficiently large transmissivity at a given surface slope and surface runoff will also occur. The discharge rate where the change starts may be related to e.g. type, distribution and size of microtopes, and to conditions in the acrotelm. If the relationship of specific discharge versus (mean) measured acrotelm transmissivity is linear, the flow process is probably restricted to the acrotelm. The point where surface water flow becomes part of the discharge system is where the slope of the line starts to decrease. Graphs were made for Clara Bog, Ireland (1992-1993), Raheenmore Bog, Ireland (1991-1992; 2002-2003) and Männikjärve Bog, Estonia (2002-2004). They show

- A transition from acrotelm flow to a mixed acrotelm and surface flow at a specific discharge level of 1-1.5 mm/d for the Irish data of 1991-1993.
- No transition at all for the Raheenmore Bog data of 2002-2003. This suggests that restoration measures, taken around 1996, have positively affected the bog ecosystem.
- A transition at about 0.2 mm/d in Männikjärve Bog, where the pool-ridge system seems to contribute to discharge even at very low rates.