Interception by sphagnum in a bog mire catchment of central West-Siberia.

Eco-hydrological research at the Mukhrinskaya Field Station (MFS)

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Guides for hydrological research at the MFS
- To estimate the annual water introduced by rains
- To estimate parameter values for hydrological modeling: porosity, water conductivity, permeability and evapotranspiration
- To analyze and model water discharge dynamics by available data sets
- To predict the possible effects of water hydrology (stray and dry river stage and discharge dynamics)

Methods
Water discharge dynamics for the mire catchment area will be calculated by:

\[ Q = \frac{A}{\Delta t} \left( \frac{\Delta h}{L} - \left( \frac{\Delta h}{L} - \frac{\Delta h}{L} \right) \right) \]

Where: \( Q \) = water discharge, \( A \) = surface area of mire type (i), \( P \) = precipitation was recorded with a rain gauge event logger (snow pack was not measured in 2008).

For potential evaporation of open water was recorded with a pressure sensor in a lysimeter filled with water.

\( E_T \) = evaporation of mire was recorded with a pressure sensor in a lysimeter filled with empty straw ecosystem

\( G \) = infiltration to groundwater was neglected

1 interception = precipitation water was calculated with:

\[ E = A \times \left( \frac{\Delta h}{L} - \frac{\Delta h}{L} \right) \]

Where the denominator is effective porosity at depth \( D \) below the mire surface, \( A \) = normalized temperatures dependent correction factor, \( \Delta h \) = storage change in known from stage change divided by effective porosity.

Results
For the period 20/7 – 24/9 the average precipitation (P) was 1.69 mm/d.
Of this amount 92.8 % was lost by evapotranspiration

By interception (33.7 % of P) an average volume of 1.83 mm was retained and subject to direct evapotranspiration.

The effective porosity in the wettest part of the acrotelm zone varied from 24% to 64%.

The dimensions of the mire catchment area have been calculated from the discharge data of the ‘balance period’ from 10/8 – 21/8. The total discharge (m³) should be equal to the product of net precipitation (m) in the catchment surface area (m²) during this balance period.

The calculated surface area was 2.6 km². By excepting that point pH is located at the watershed divide the dimensions of the catchment are 1.7 km length (E-W) and 1.5 km width (N-S). For exact location of the catchment boundaries additional elevation measurements (leveling) should be performed.