MONITORING OF VERTICAL SOIL MOVEMENTS IN LOW DECOMPOSED DEEP PEAT SOIL PROFILE

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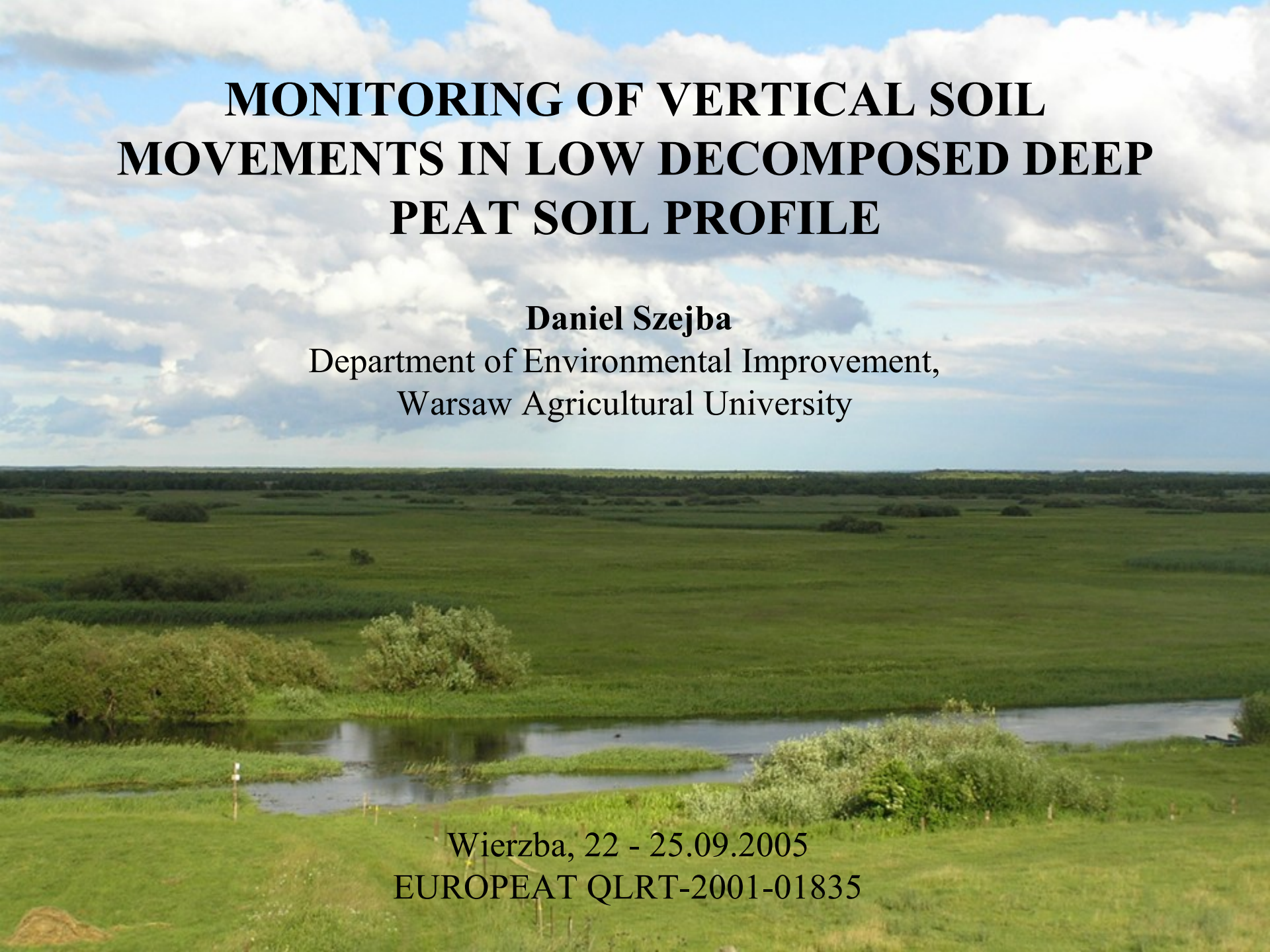

Wierzba, 22 - 25.09.2005
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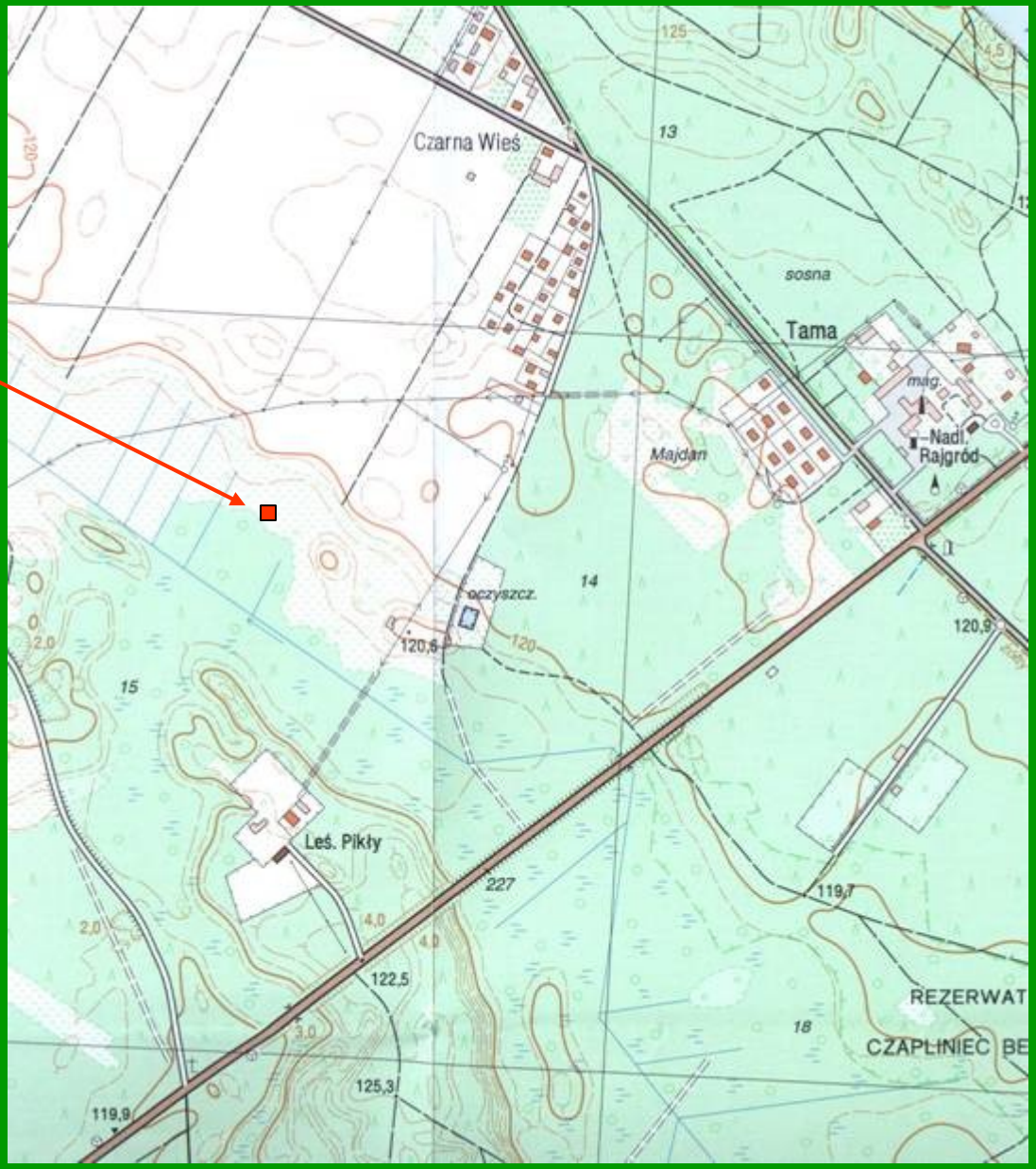
POLSKA

The aim of this presentation is to analyze the soil vertical movements caused by soil water storage changes in low decomposed deep peat soil profile.

Scale app. 1:10 000

„Czarna Wieś” experimental site



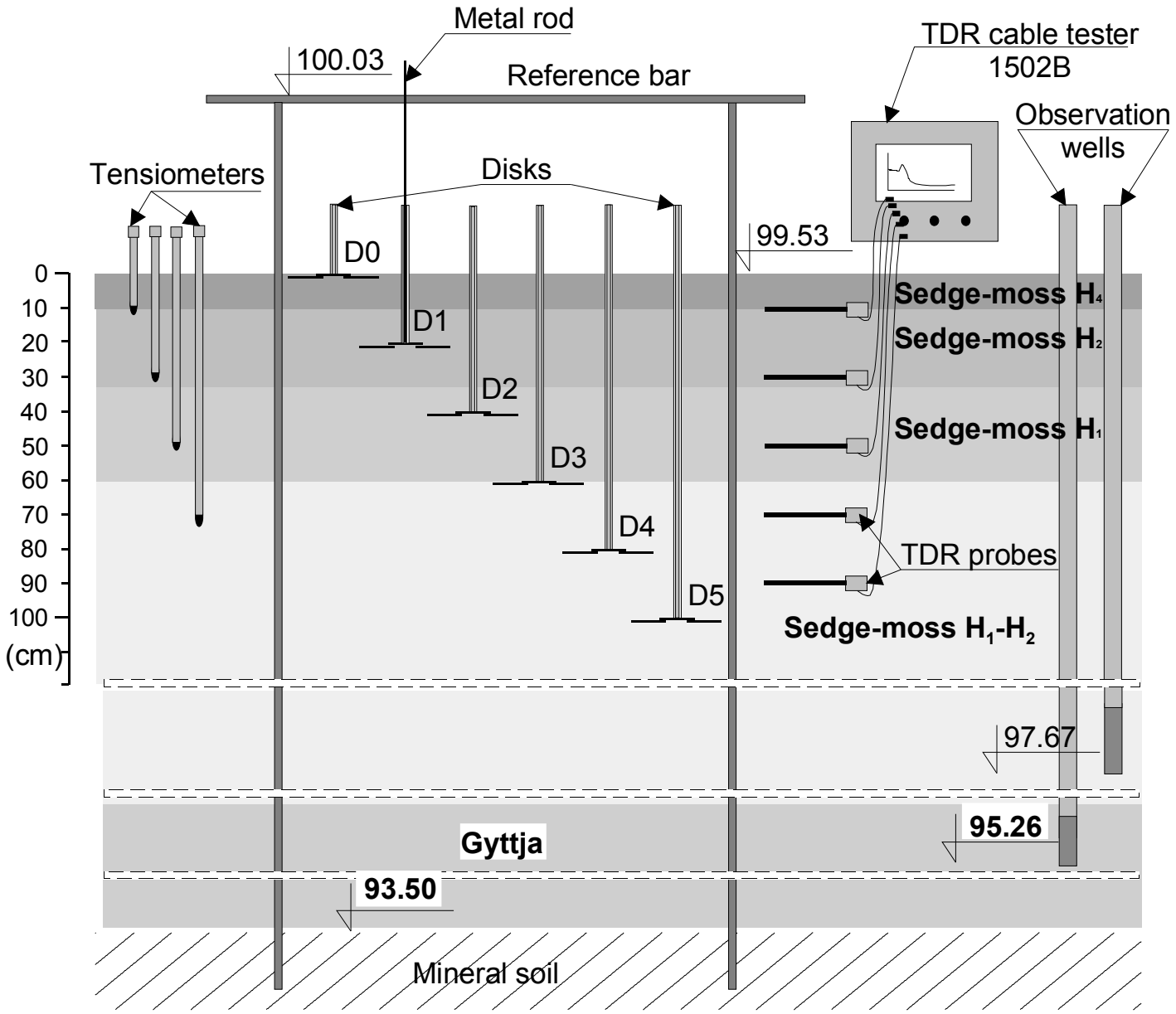
0 - 10 cm layer,
Peat species: sedge-moss peat,
Degree of decomposition: H_4,
Layer of sludged, overgrowth by turf roots peat.

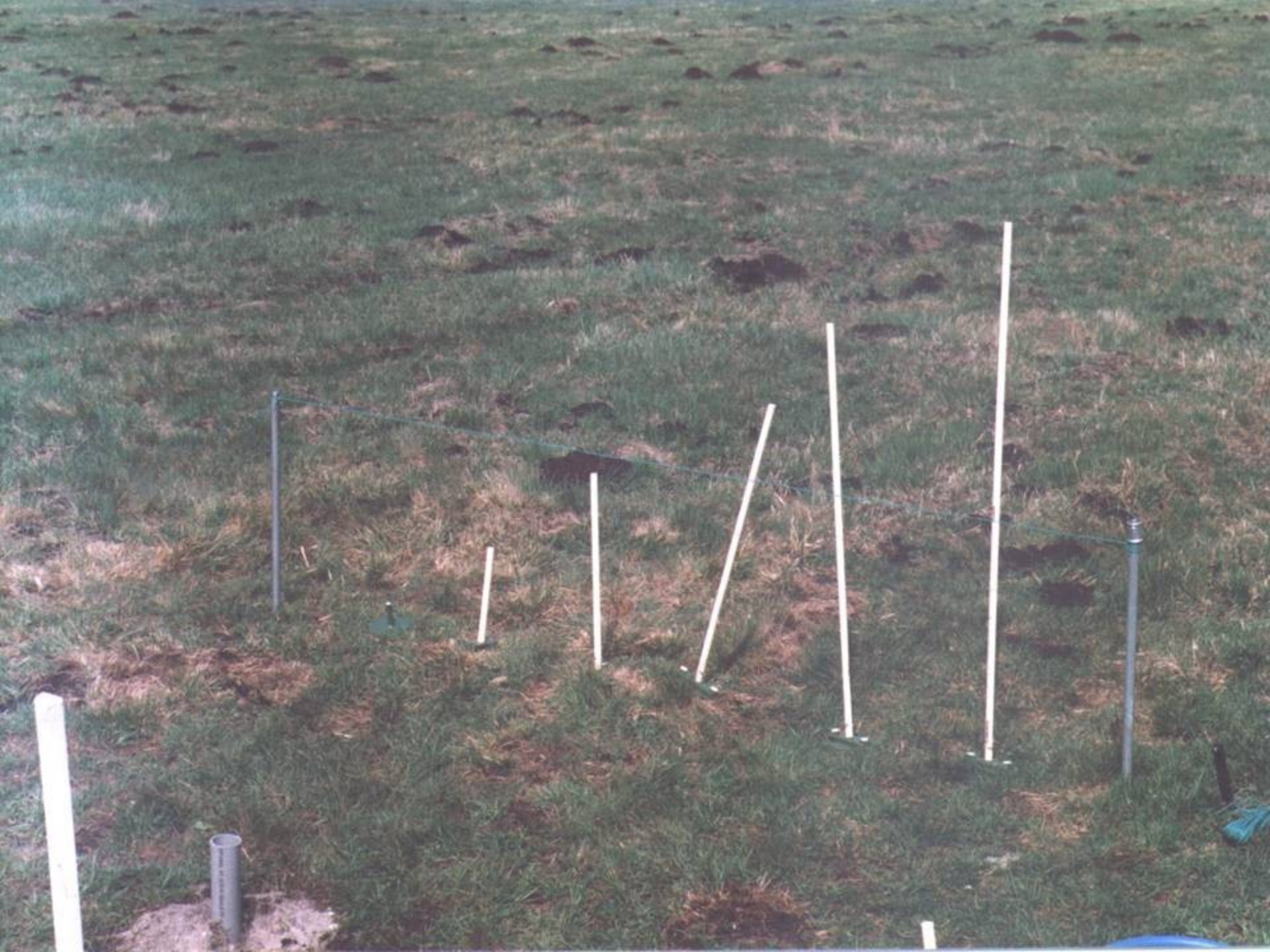
20 - 30 cm layer,
Peat species: sedge-moss peat,
Degree of decomposition: H_2 - $H_{2,5}$,
Spongy structure, with clear visible plant residuals.

40 - 50 cm layer,
Peat species: sedge-moss peat,
Degree of decomposition: H_1,
Spongy structure, with clear visible plant residuals.

70 - 80 cm layer,
Peat species: sedge-moss peat,
Degree of decomposition: H_1 - H_2,
Spongy structure, visible root-stock.

SCHEME OF THE EXPERIMENTAL PLOT AND MEASUREMENTS DEVICES



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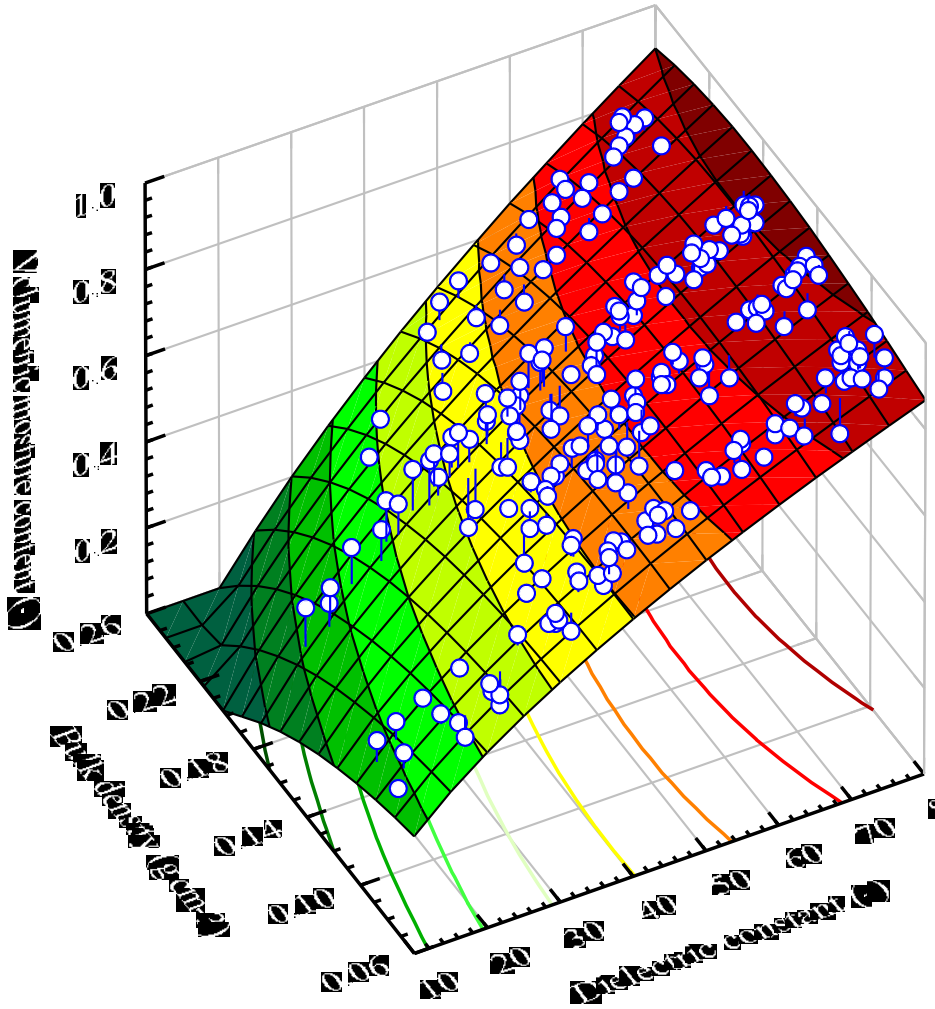
VOLUMETRIC MOISTURE CONTENT AS A FUNCTION OF SOIL BULK DENSITY AND DIELECTRIC CONSTANT



Volumetric moisture content (m^3 m^{-3})

- 0.1
- 0.2
- 0.3
- 0.4
- 0.5
- 0.6
- 0.7
- 0.8
- 0.9
- above

$$\theta_v = \frac{\sqrt{K_a} - 18.6619\rho_b^2 - 13.8513\rho_b + 0.383943}{25.8003\rho_b^2 - 32.0302\rho_b + 11.5445}$$

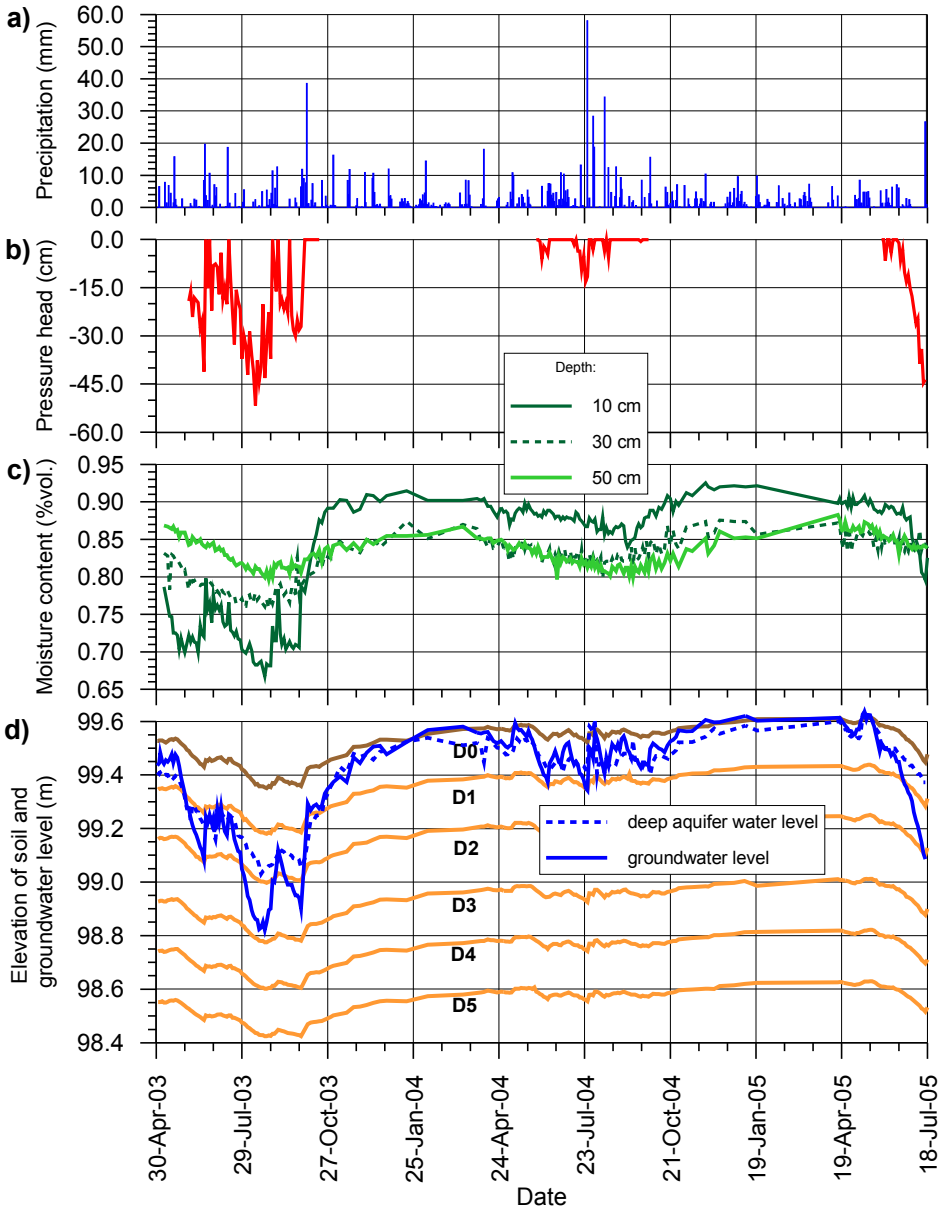
θ_v = volumetric moisture content (m^3 m^{-3})

$\sqrt{K_a}$ = square root of dielectric constant

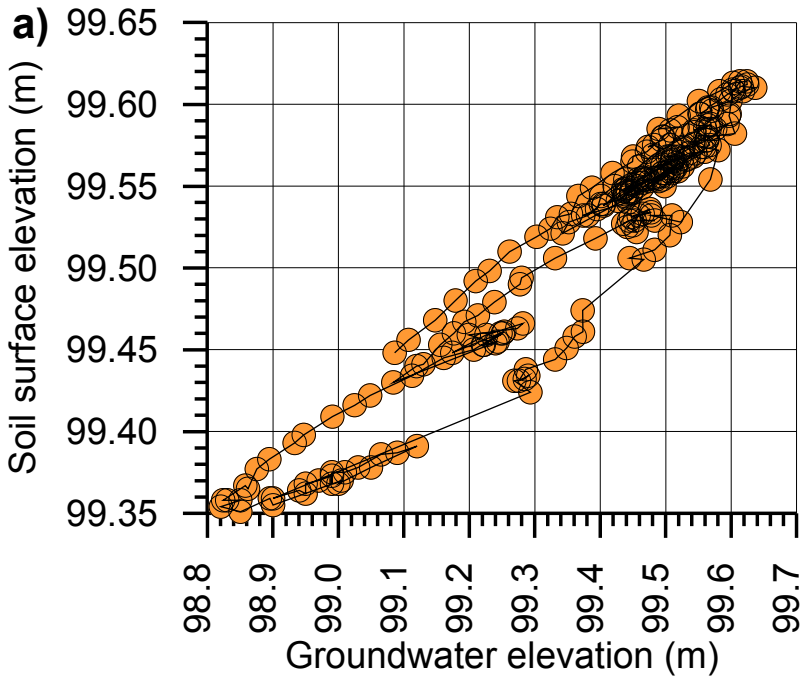
ρ_b = soil bulk density (g cm^{-3})

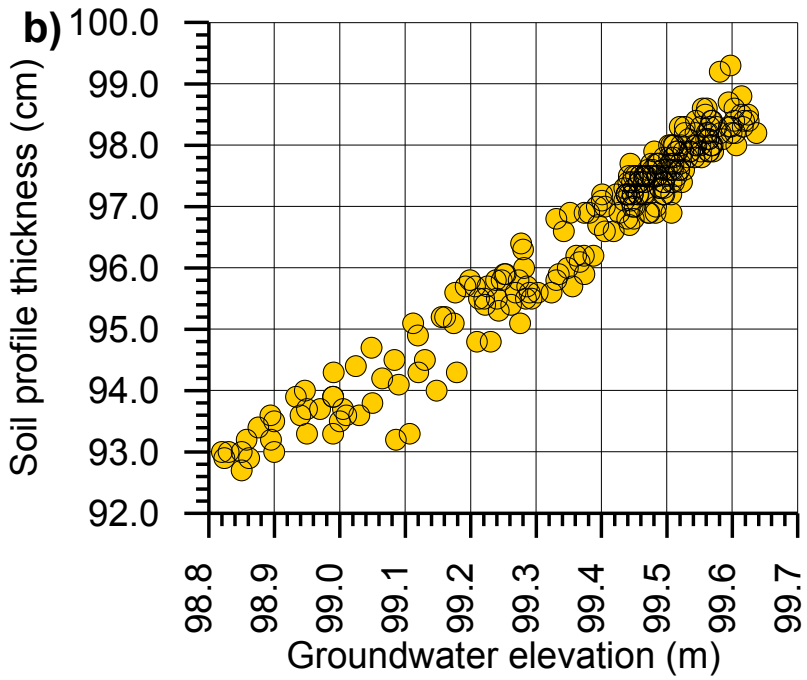

Tensiometer
-079
hPa

RESULTS OF FIELD MEASUREMNTS IN THE SOIL PROFILE



GROUNDWATER LEVELS VS. SURFACE ELEVATION AND THE PROFILE THICKNESS





CONCLUSIONS

It can be concluded from this work that deep fen peat soils changes their volume in response to groundwater (soil moisture) changes.

The field study carried out during the period from April 2003 to July 2005 showed that the soil elevation changes could be significant. The soil surface of the fen peat soil moves in response to groundwater level with a maximum of 270 mm during the whole period.

CONCLUSIONS

The differences between the soil surface elevation at the same groundwater level elevation during drying and wetting periods are observed. During the study period the decrease of the groundwater level of about 80 cm reduced the thickness of the 98 cm soil profile of about 60 mm.


Thank you for attantion