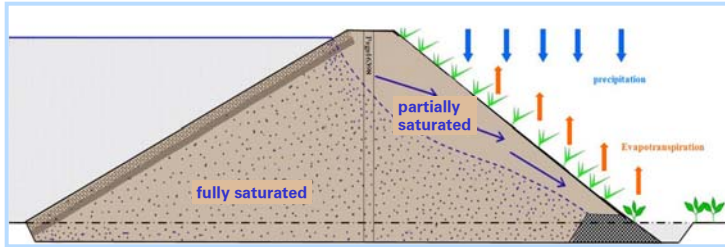# PCSiWaPro® - Application
Simulation of the Water Balance in Earth Dams and Dikes

Water balance in the dam body during flood retention
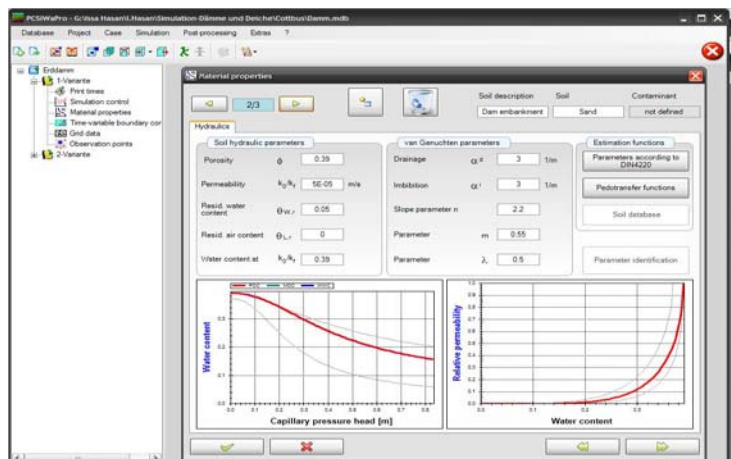

Small scale test in the Hydraulic Lab of TU Dresden

→ Landslides occur already in partly saturated areas!

Simulation by means of PCSiWaPro®

Advantages of the simulation software PCSiWaPro®

- 2D-simulation of water balance and transport processes
- easy to handle Windows Software
- GUI that is adapted to several languages (German, English, Spanish, French, Polish, Japanese, Vietnamese, Arabic)
- easy presentation of the results due to several interfaces to graphical software
- flexible choice of boundary conditions
- consideration of atmospheric boundary conditions, root water uptake and soil evaporation
- interface for GeODin-databases
- consideration of hysteretic processes within the unsaturated zone
- implemented algorithm for parameter identification
- integrated weather generator for arbitrary time series in high resolution
- automatic discretization with finite element – mesh generator
- soil databases DIN 4022, DIN 4220, pedotransfer functions

PCSiWaPro® - Application

Investigation of existing and prognostic flow conditions under special consideration of water saturated and unsaturated zones in a protective structure (earth dam)

Variable boundary conditions and water saturation
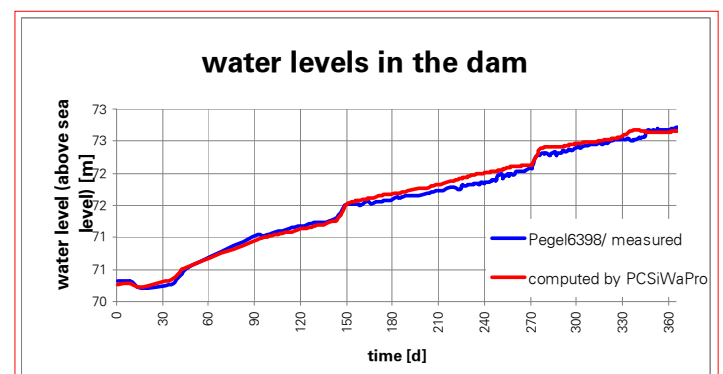

The sensitivity of hydraulic material parameter (VAN GENUCHTEN-LUCKNER)
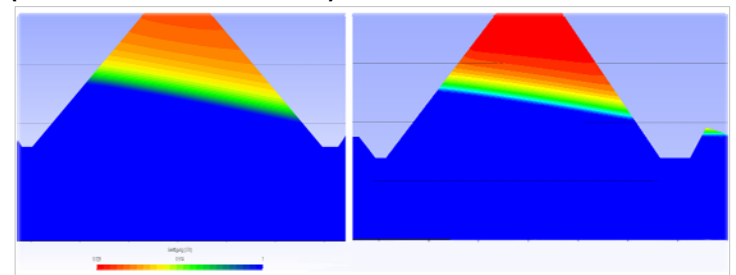
Although the water level in the dam embankment hardly changed, a significant difference from the partially saturated zone above the seepage line could be observed.

Comparison between the computed and measured water levels in the dam embankment

water levels in the dam

- The agreement between the measured values and the computed ones using the program PCSiWaPro® was very good for both cases. Deviations could be caused by poorly estimated hydraulic soil parameters, as these are based on the given DIN 4220 values and not on actual measurements.
- The results of simulation variants show clearly the sensitivity of the model parameters (geometry, material parameter and hydrogeological boundary conditions).

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