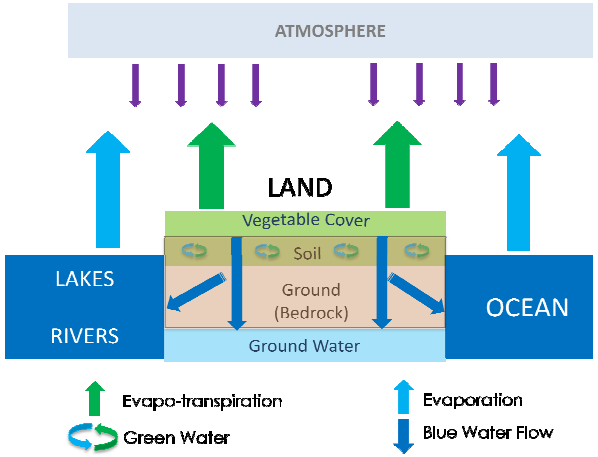
TWO DIRECT APPLICATIONS

Modeling Green and Blue Water Cycles at Global Scale



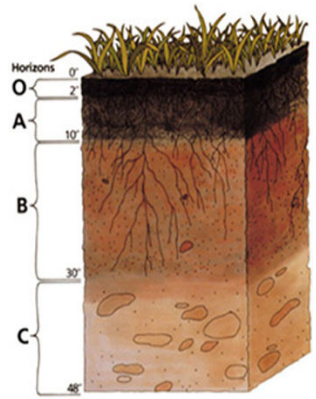
Modeling the two water cycles (green water and blue water) at *global scale* by passing from the soil mapping unit to higher levels of hydro-functional organization units (farm, watershed, etc.)

Studying Soil Processes in Laboratory at the Pedostructure Level

Controlling the pedo-climate and the flux of different water quality to study the diverse processes in the soil medium

The Pedon: Object of Study [System-Thermodynamic Approach]

A pedon is a representative elementary volume of a soil mapping unit.



Source:www.theanimalfiles.com

Many processes happen inside the organized soil medium

- Organic matter mineralization
- Roots dynamic and growing
- Microbiology life
- N and C cycles
- Pesticides transfer, accumulation etc.
- Geo-chemical processes

Soil is a physical **organized** medium allowing for life. In this organized medium, all processes are conditioned by:

- **Pedo-structure**: the soil medium organization as an assembly of primary aggregates.
- **Pedo-climate**: the soil - water - air thermodynamic equilibrium with the **pedo-structure**.

TEXAS A&M UNIVERSITY

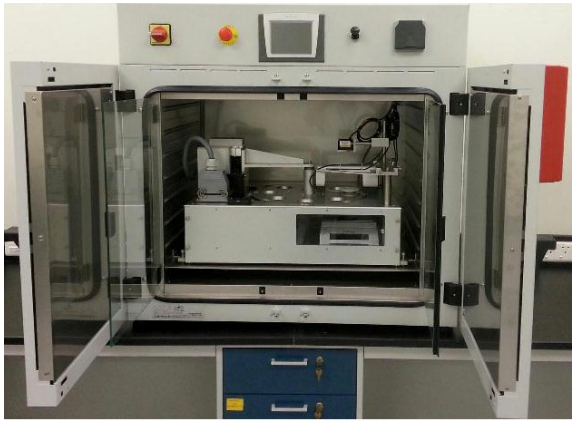
Pedostructure Characterization Laboratory

WEF Nexus Texas

Texas A&M University

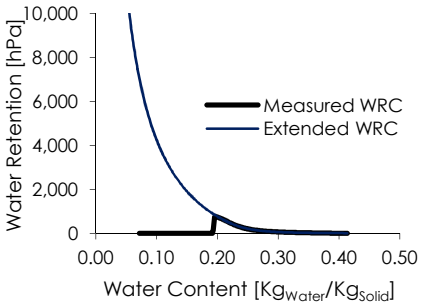
2014

PEDOSTRUCTURE CHARACTERIZATION
[Hydro-structural Properties]



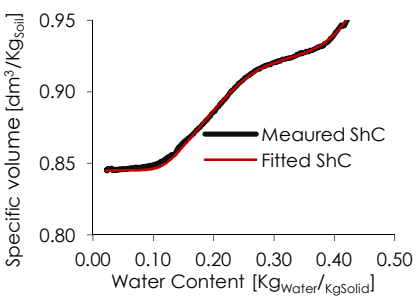
TYPOSOIL®

Pedostructure Retention Curve



The entire curve is described by a physical parametric equation of 4 parameters. These are characteristics of the pedo-structure

Pedostructure Shrinkage Curve

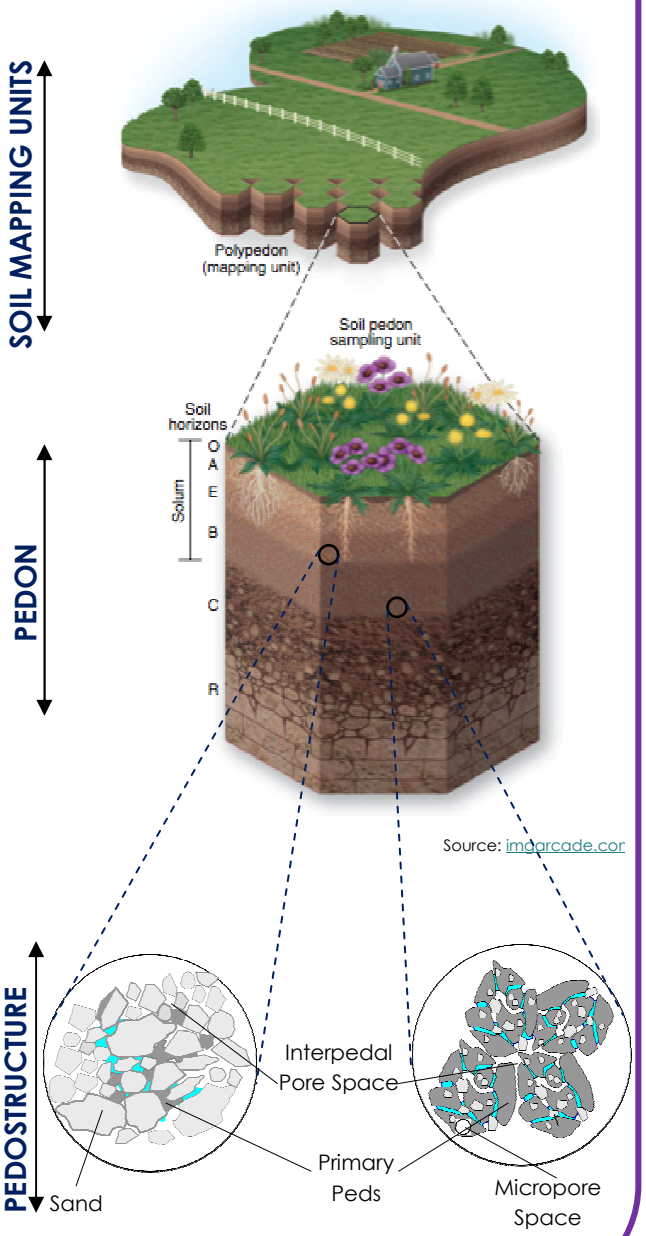


The shrinkage curve equation has 6 to 8 parameters, characteristic of the pedo-structure

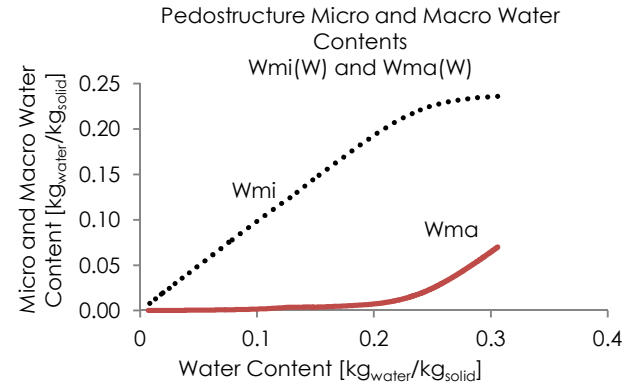
These two characteristic curves describe the hydrostructural equilibrium state of the soil medium at each value of the water

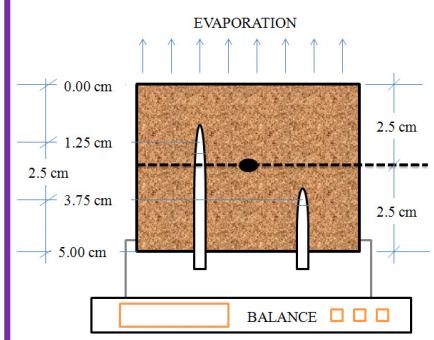
THE HIERARCHICAL ORGANIZATION OF SOILS

[Natural Hydro-functional Levels]



PEDOSTRUCTURE CHARACTERIZATION
[Hydro-dynamic Properties]





Knowing *Wmi* and *Wma* at each value of the water suction *h* allows to measure the two parameters of the pedo-structure hydraulic conductivity (figure below)