



An open access "soil structure library" for standardized analysis

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Many processes in soil depend on its porous structure and, vice versa, this structure is the result of many processes ongoing in soil. This is why soil structure would be an excellent indicator for soil processes and soil functions. However, soil structure is notoriously difficult to quantify using simple and reproducible methods that can also be used in the field if possible.

On the other hand, highly sophisticated tomographic techniques are available today allowing for the visualization of undisturbed 3D soil structure at a range of spatial resolutions. However, this can only be done in specialized labs and definitely not in the field.

To generate a comprehensive data base for 3D soil structures together with important meta data on the specific soil and site conditions we implemented a "structure library" as an open access web application (<https://structurelib.ufz.de>). Everybody can upload his/her 3D image data to get an automated, standardized analysis on porosity, pore size distribution, pore connectivity as well as extend and curvature of pore-solid interfaces. This service is for free, the only price is to provide the image data and make them freely available for the scientific community.

One aim is to foster standardized and comparable analysis of soil structure. Another objective is to set up a substantial data base which allows to identify attractors for the morphology of soil structure that can be linked to observable soil characteristics as e.g. soil texture, organic carbon and bulk density but also different land use practices under different climatic conditions. This may pave the way towards a more meaningful characterization of soil structure as an indicator for soil functions.