



What about the regolith, the saprolite and the bedrock? Proposals for classifying the subsolum in WRB

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Since soil surveys in the past were mainly conducted in support of agriculture, soil classification tended to focus on the solum representing mainly the upper part of the soil cover that is exploited by crops; the subsolum was largely neglected. When dealing with environmental issues - such as vegetation ecology, groundwater recharge, water quality or waste disposal - an integrated knowledge of the solum to subsolum continuum is required. In the World Reference Base for soil resources (WRB), the lower boundary for soil classification is set at 2 m, including both loose parent material as well as weathered and continuous rock. With the raised concern for environmental issues and global warming, classification concepts in WRB have been widened over the last decades. Cryosols were included as a separate Reference Soil Group to account for soils affected by perennial frost; Technosols were included to account for soils dominated by technical human activity. Terms for describing and classifying the subsolum are however still lacking. Nevertheless, during soil surveys a wealth of information on the subsolum is also collected. In Luxembourg, detailed soil surveys are conducted according to a national legend which is correlated to WRB. Quantitative data on characteristics of the subsolum, such as bedding, cleavage, fractures density and dipping of the layer, are recorded for their importance in relation to subsurface hydrology. Drawing from this experience, we propose defining four “subsolum materials” and which could be integrated into WRB as qualifiers. Regolitic materials are composed of soil and rock fragments deposited by water, solifluction, ice or wind; Paralithic materials consist of partly weathered rock with geogenic structural features; Saprolitic materials are formed from in situ weathering of the underlying geological deposits; Lithic materials correspond to unaltered bedrock. We discuss how these characteristics could be integrated into WRB and how additional qualifiers pertaining to bedding, cleavage, fractures and lithological features could also be considered. These definitions will be particularly useful for giving more precise information of Reference Soil Groups representing shallow and/or poorly weathered soils such as the Cambisols, Regosols and Leptosols. Our definitions should contribute to better recording and classifying information on the soil to subsoil continuum, and doing so, improve the usefulness of soil survey data in environmental applications.