

## Table of Contents

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## Building soil spectral library of the Czech soils for quantitative digital soil mapping

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Spectral libraries are the data archives of spectral signatures measured on natural and/or man-made materials. Here, the objective is to build a soil spectral library of the Czech soils (SSL-CZ). Further on, the overall aim is to apply diffuse reflectance spectroscopy as a tool for digital soil mapping. An inevitable part of the library is a metadata database that stores the corresponding auxiliary information on the soils: type of material (soil, parent material), sample preparation, location of the sample with geographic coordinates, soil classification, morphological features, soil laboratory measurements – chemical, physical, and potential biological properties, geophysical features of and climatological information on the sample location. The metadata database consists of seven general tables (General, Spatial, Soil class, Environmental, Auxiliary, Analytical and Spectra) relationally linked together. The stored information allows for a wide range of analyses and for modelling developments of digital soil mapping applications. An example of partial least-square regression (PLSR) modelling for soil pH and clay content with 0.84 and 0.68 coefficients of determination is provided on the subset of the collected data. Currently, the SSL-CZ database contains more than 500 records in the first phase of development. Spectral reflectance signatures are stored in the range of 350 to 2500 nm with a step of 1 nm measured by ASD FieldSpec 3. The soil spectral library developed is fully compatible with Global Soil Spectral Library (Soil Spectroscopy Group).

**Keywords:**

diffuse reflectance spectroscopy; digital soil mapping; soil; spectral library

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