



Integrative field and lab approach to study soil parameters

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Geophysical field data can be very useful to investigate relative variations of physical parameters on a specific field site. However, absolute values of different or identical field sites at different times are hardly to interpret because of seasonal and site dependent soil conditions like moisture content, soil temperature, pore size distribution, connectivity of pores, pore fluids etc. On the other hand, geophysical lab data are acquired under well defined conditions with high accuracy and good repeatability allowing a good comparison of absolute values. However, these lab measurements are normally carried out on soil samples of small scale compared with the field data of natural scale. To allow a “better”, more general interpretation of geophysical field data we investigate the link between geophysical lab and field data. In the framework of the iSOIL project we conducted mobile geophysical mapping with EMI, GPR and gamma-ray methods at several field sites with varying soil types. After mapping we collected soil samples in size of 50kg each from representative field plots in 2 different depths (topsoil and subsoil). These big scale samples were used for detailed geophysical lab measurements to investigate DC-resistivity and GPR traveltimes and amplitudes with varying water content in naturally occurring ranges, while for gamma-ray lab measurements samples had to be oven-dried.

In this case studies we give a short note about the technical procedure of soil mapping and our accompanying lab measurements with advantages and disadvantages. Furthermore, we will discuss the derived results from field and lab measurements from a more statistical point of view and will show how lab data can support interpretation of field data sets.

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