

ELECTROPHYSICS AND GEOINFORMATION SYSTEMS IN SOIL-AGROCHEMICAL RESEARCH

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Electrical geophysical surveys are very wide spread in geology, hydrogeology, meteorology and other studies. Many methods and equipment has been commercialized for such surveys. Unfortunately, classical soil science still lags in adopting methods of electro-geophysics. Our team has been applied those methods to soil studies for more than 40 years, and has invented and brought to market versatile and portable device, LandMapper™, for use in the field (down to 30m) and in the lab on any semi-solid and liquid media – soil samples, pastes, suspensions etc. LandMapper™ was used to measure and the results were plotted in GIS software, such as Surfer and MapInfo to map and monitor various soil properties. On drained and cultivated peat soils of Yachroma Valley, Moscow Region electrical resistivity (ER) depends on water content (at extreme dryness state), bulk density, degree of mineralization, cation exchange capacity (CEC) and amount of applied mineral fertilizers. Geophysical survey is recommended before soil sampling and ER maps were used as a guide for selecting sampling sites, only taking soil from areas with contrasting ER. We present here an advantage of electrical geophysical methods for soil studies in mapping and monitoring at multiple scales to evaluate soil anisotropy non-destructively with any resolution.