Geophysical Research Abstracts,
Vol. 11, EGU2009-6817, 2009
EGU General Assembly 2009

Joint use of multiple geophysical methods to map areas of organic matter in lakes

M.C. Looms (1), L.O. Boldreel (1), J. Kidmose (1), P. Engesgaard (1), B. Nilsson (2), and H. Lykke-Andersen (3)

(1) Department of Geography and Geology, University of Copenhagen, Øster Voldgade 10, 1350 København K, Denmark (mcl@geol.ku.dk), (2) GEUS, Geological Survey of Denmark and Greenland, Øster Voldgade 10, 1350 København K, Denmark, (3) Geological Institute, University of Aarhus, Høegh-Guldbergs Gade 2, 8000 Århus C, Denmark

In the EU water frame directory, groundwater/lake water interaction is recognized as playing an important part in water administration. In order to construct hydrological models that include this interaction improved spatial information, concerning the geology beneath the lake and whether seepage is occurring, is required. Conventional methods such as seepage meters, hydraulic gradients, and stable isotope measurements only give reliable point estimates of groundwater in- and out flow rates, and core samples provide exact information concerning the geology.

In this study three geophysical techniques; reflection seismic, ground penetrating radar and multiple electrode profiling, are measured at Lake Hampen. This groundwater seepage lake is located on sandy deposits and is one of the cleanest lakes in Denmark. The recorded reflections and the electrical property, along with cored data, are used to estimate the sediment types and thicknesses at the lake bottom. Areas with thick layers of gyttja or peat are expected to reduce groundwater seepage, while a sandy lake bottom will enable high rates of in- and outflow. The geophysical measurements thereby help identifying areas of potential groundwater seepage that later can be verified using more traditional point measurements.