

NANOTEM

ELECTROMAGNETIC PROBING OF THE SUB-SURFACE

Introduction

NanoTEM is an electromagnetic induction technique that maps the electrical conductivity of the sub-surface from the surface in a non-destructive way. This geophysical technique is used for the mapping of metal objects and the geo(hydro)logical soil construction of the sub-surface up to a depth of a few dozens of metres.

Measuring principle

The measuring principle of this technique is based on the inducement of an electromagnetic field in the sub-surface, by means of a current loop. The decline of this electromagnetic field within the several ground layers is then measured in a secondary current loop which can then be converted to the electrical conductivity (resistivity) of the sub-surface. During the generating of an accurate sub-surface model we take advantage of the fact that different (geological) materials have differing electrical resistivities.

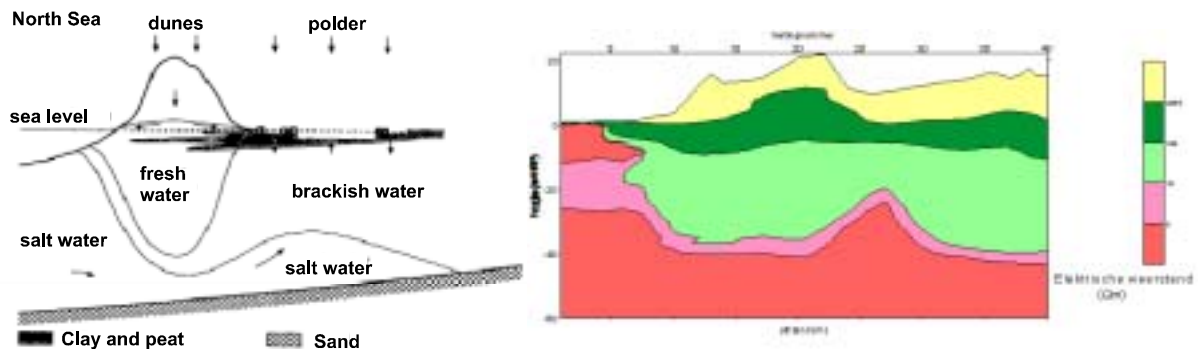


Applications

The NanoTEM technique is used for several applications. An important application of NanoTEM is the exploration of the geological structure of the sub-surface up to a depth of several dozens of metres. Moreover, less deep applications such as the detection of metal objects, thin clay layers and ground water pollution are also examples of the many NanoTEM application options.

Project example

In the left-hand figure below a schematic profile through the dunes near the Dutch coast is given. In the figure to the right of it, the electric resistivity - as determined by NanoTEM measurements - of the sub-surface is shown. The top layer of dry sand (displayed in yellow) with a high resistivity is clearly visible. Below it is a zone with lower resistivity, which corresponds to fresh and brackish water (the two green areas). At the bottom of the cross section is the layer with a very low resistivity, caused by sand layers containing saltwater (the red areas).



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