

Actualization of a 40 year old salinization map of the eastern Belgian coast using airborne time-domain electromagnetic survey (SkyTEM)

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ABSTRACT

The Belgian eastern coastal plain, bounded by the Dutch border in the east and the Boudewijn-channel in the west, is a region with diverse economic and social activities including seaports, agriculture, tourism, recreation, housing and nature. The groundwater is partly intruded with salt water, resulting in the occurrence of fresh, salt and brackish groundwater. This fresh- salt water distribution was mapped in the 60s - 70s, and published as the so-called salinity map. It has been used for many studies relating to groundwater. Half a century later, there is a need for a new map. The area has undergone many developments where the freshwater saltwater distribution was affected (especially the expansion of the port and the urban area). In addition to that there are large-scale projects planned in which the fresh-salt water distribution is an important aspect. The present freshwater lenses are also used for drinking water. The new map will contribute to the knowledge of the size of these freshwater lenses and provide a reference situation for short -and long- term projects. The comparison with the old map will also give insight into the autonomous development of the freshwater - saltwater distribution in relation to sea level rise and climate change.

The new map is made based on airborne geophysics, using the SkyTEM system attached to a helicopter. We will show how we incorporated prior information (such as borehole logs and sample analysis) to produce the final map. In addition to that we will analyze the difference with the 40 year old map, taking into account the difference between the methods used then, and the advanced possibilities we have now.

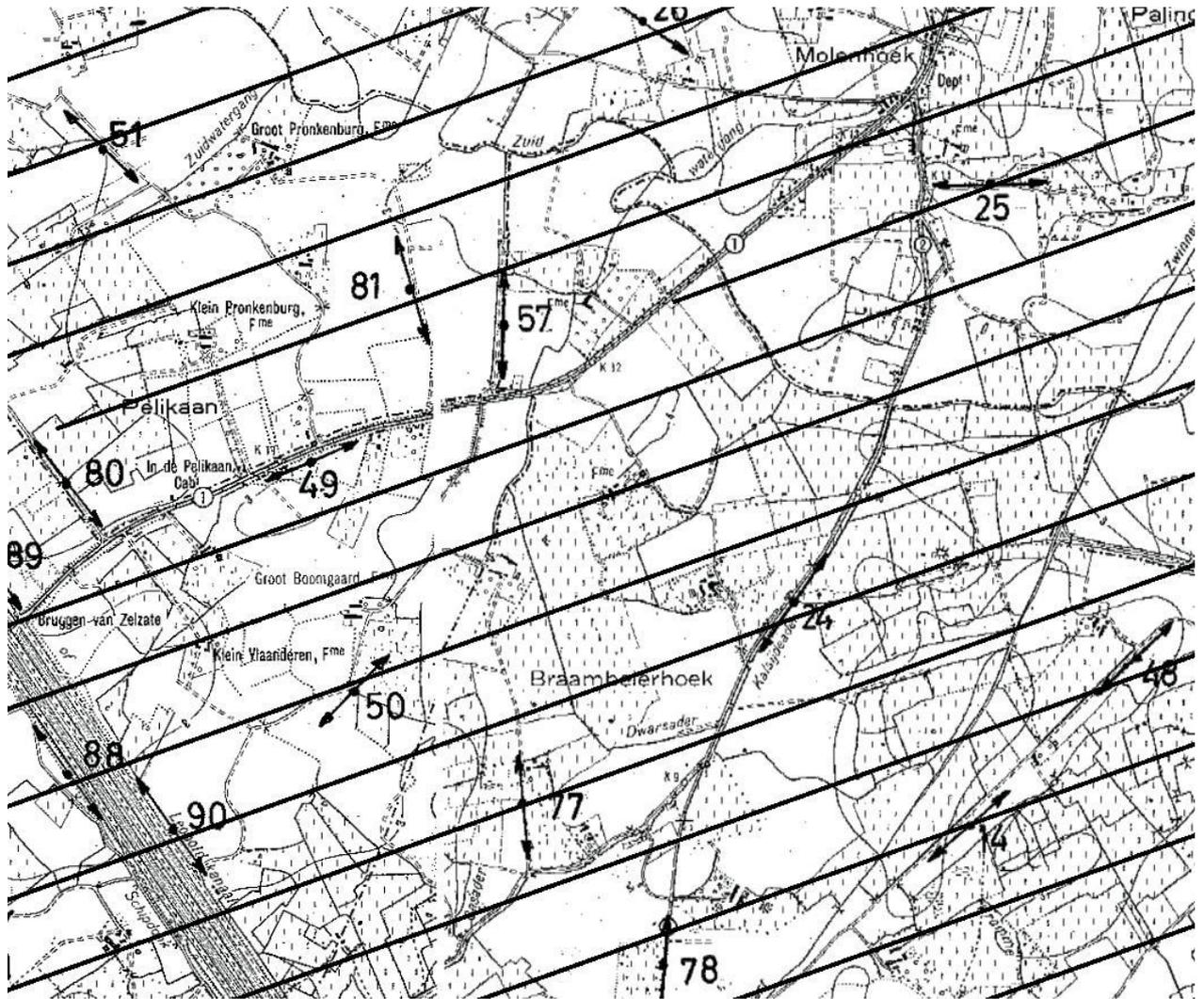


Figure 1. Flight lines of the SkyTEM survey (black lines, distance 250 m) projected on the old map with numbered VES locations.

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