Interactive comment on "Combining
ground-based and airborne EM through Artificial
Neural Networks for modelling hydrogeological
units under saline groundwater conditions" by
J. L. Gunnink et al.

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The application of ANN for the interpretation of airborne geophysical
data represents a very interesting topic. This paper represents one of
the few successful case studies reported so far. However we expect a
large potential for the future. Therefore this paper is very relevant.
I have just 2 comments:

From the description of the data processing routines it seems that SKYTEM
data was much more sensitive to noise then HEM. Is this observation
correct or is it just because the chapters were written by different
authors pinpointing different aspects?

There are some reasons why the data of an HEM system could be less noisy:
1) The footprint of the SkyTEM system is larger than the footprint of an
HEM system. So the "sensitivity to man-made effects" radius should be
smaller for HEM systems and ,thus, resulting in smaller data area
affected by man-made noise.
2) The sampling distance of the HEM system is about 10 times higher than
that of the SkyTEM system. So peaks and other high-frequency noise can be
easily filtered out.
3) Man-made effects predominantly influence the two low frequencies of
the HEM system. As the data of each frequency is recorded independently,
the high-frequency data are often fine even close to man-made sources. In
a transient, the data in all time gates cannot be independently measured.

The authors describe the successful application of ANN to derive the
location of the till layer. However they do not compare the ANN results
to those directly derived from the constraint inversion of the EM data.
It would be very interesting to see to what degree the location of the
till was more accurate when applying the ANN detection.

Deriving geological information from airborne EM is predominantly carried
out by skilled geophysicist / geologist who have knowledge in both fields
(geophysics and geology) to appreciate the value of the EM in relation to
the geology of the area. This combination of skills is rare and the
process of interpretation is time-consuming. We did not carry out such a
manual interpretation, simply because we did not have staff available
that possesses skills in both expertise's.