Data Issues 1

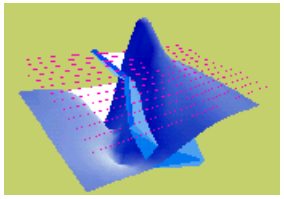
Imaging and Inversion of 1 Line of EM31/34 data.

Data Positions: The chained values were assumed to be a NS line and converted to negatives (i.e. south).
Our convention is that y is NS – positive North. It is not necessary to do this, but it is convenient.

Data: The data will be shown in the next few slides. However, roughly every second data point was missing in the 40m separation. These missing data were interpolated. This is not necessary, but we weren't sure how you wanted to handle the missing data points. Several data entries in the 20m and 40m separations have negative apparent conductivities. Although, this is of course possible for strong 3D effects when the secondary voltage is converted to apparent conductivity through the formula Geonics uses. I did not change these values but at least some of them seem inconsistent with the other dipole orientation at the same separation and with the other separation data.

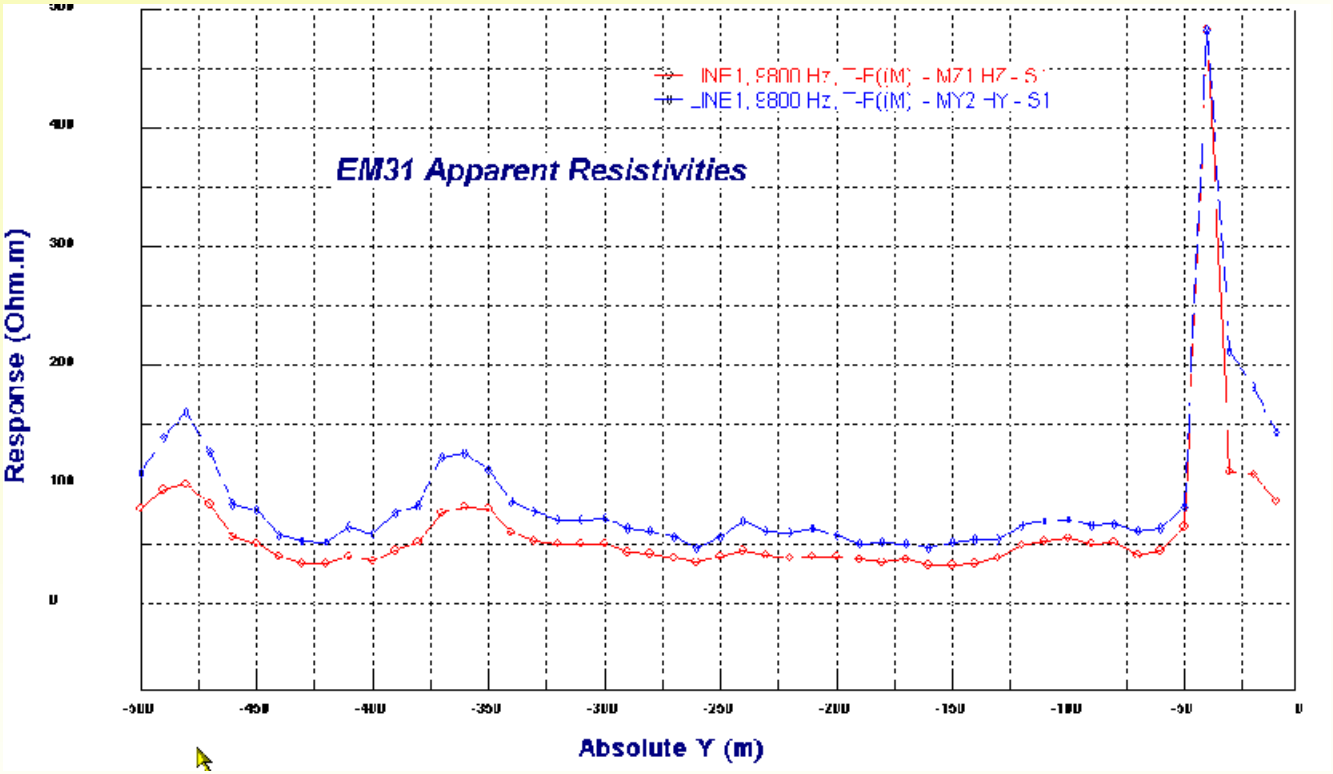
The h40 reading at station 60 is very much out of line with other data and with the v40 and v20 and h20 data. This could be real, of course, but would be a 3D effect and would have to be handled with 3D modelling. I have interpolated this data point – h40 and stat 60.

Note: Understood h10 to mean horizontal dipoles (vertical coplanar) and
v10 to be vertical dipoles (horizontal coplanar). This is the opposite of Vlad's understanding.



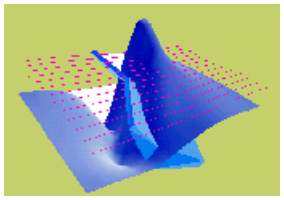
Data Issues 2

EM31: EM31 data (H and V) shown as apparent resistivity. Clearly, a conducting cover of about 50Ohm-m apparently getting more resistive to the North and South.



Vertical Dipole

Horizontal Dipole



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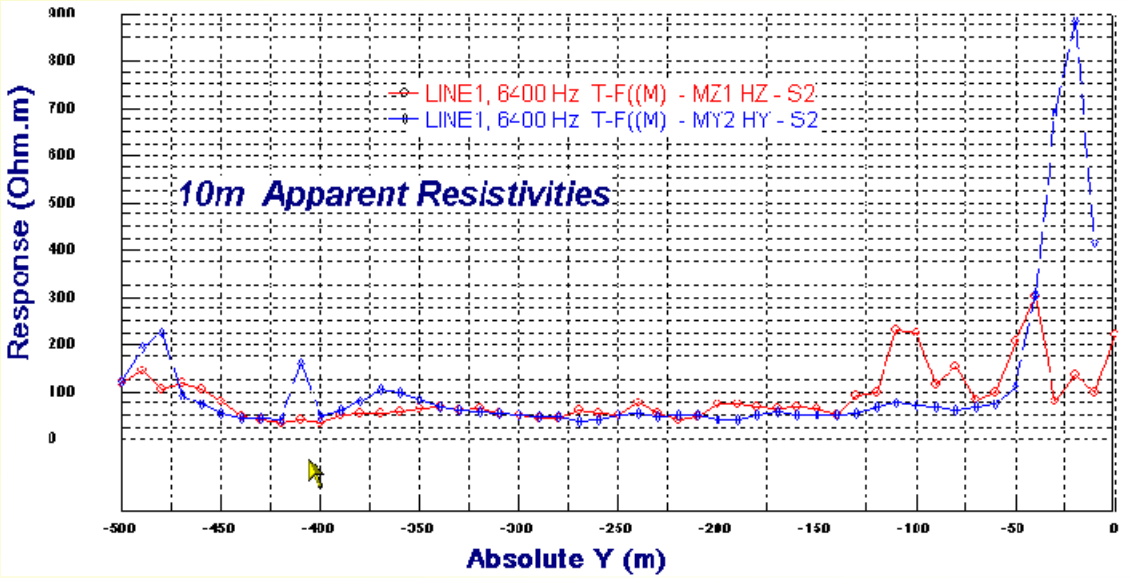
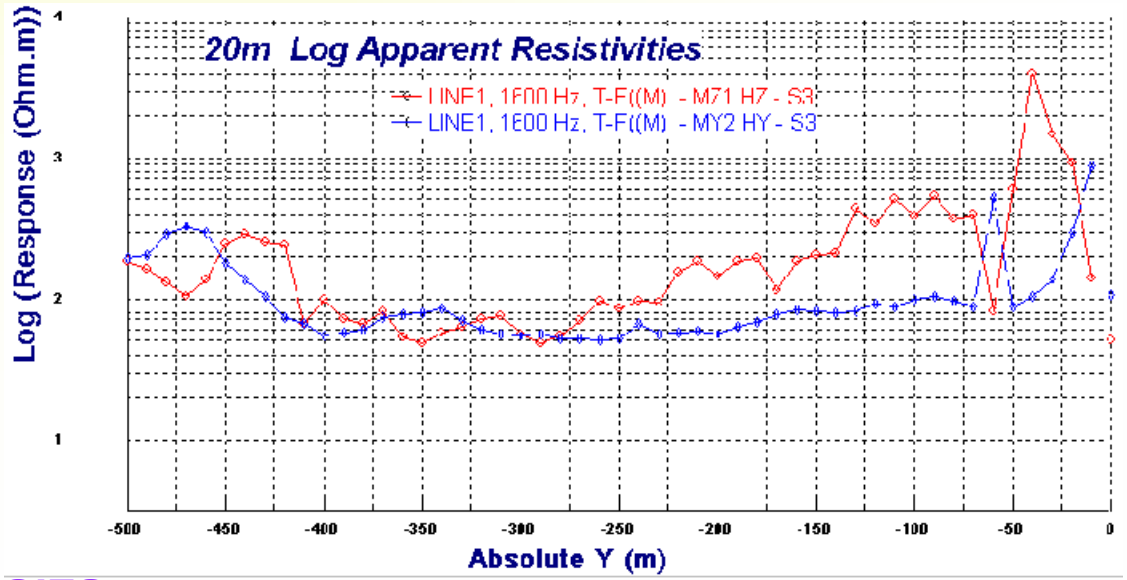
Data Issues 3

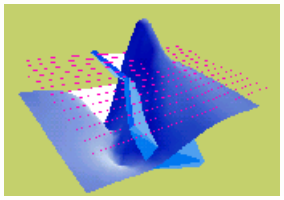
EM34: 6400Hz data again shows a conducting cover of about 50Ohm-m again apparently getting more resistive to the North and South.



EM34: 1600Hz data again shows a conducting cover of about 50Ohm-m but now shows the resistive underlay more towards the centre of the transect.

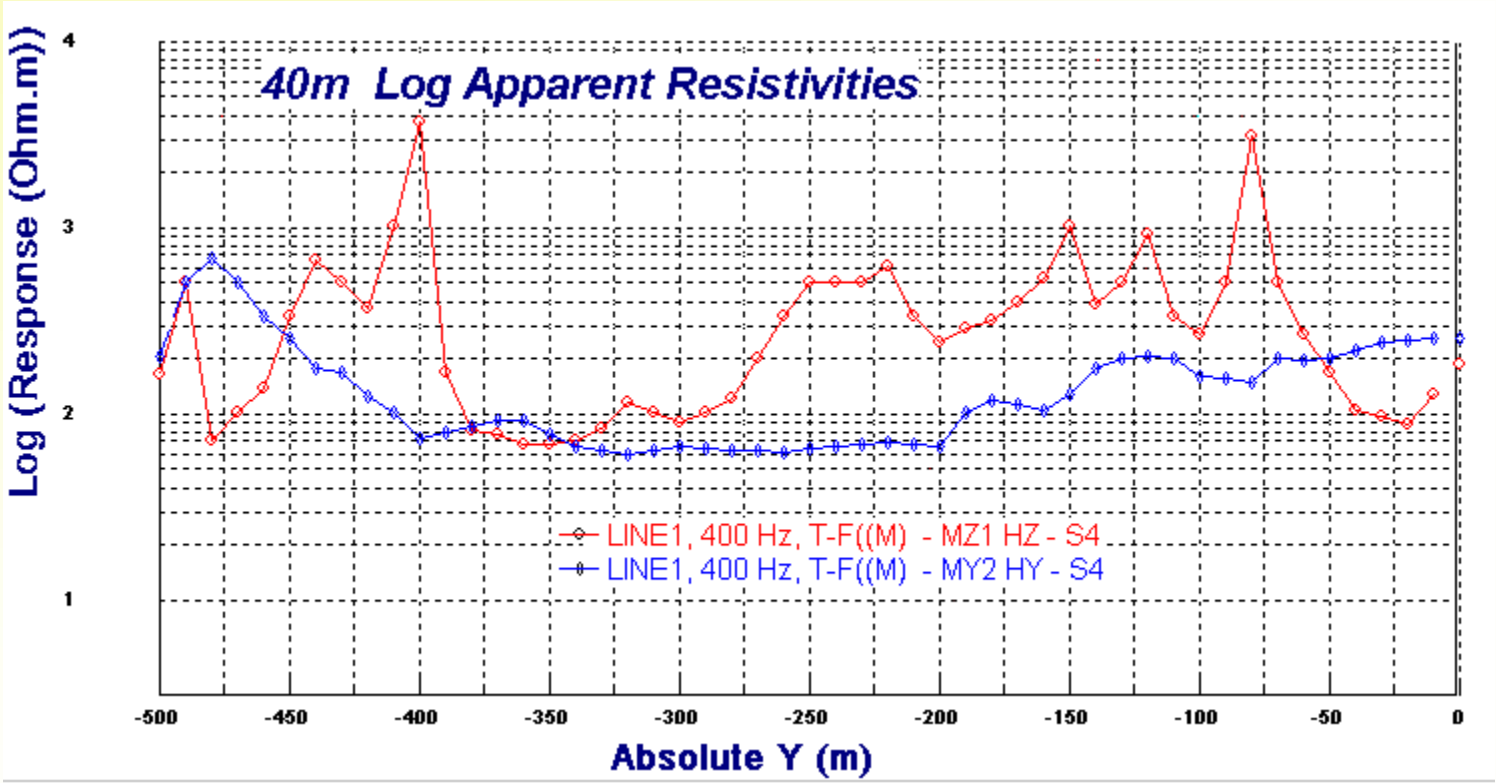
Note: Apparent Resistivities shown Log to base 10.

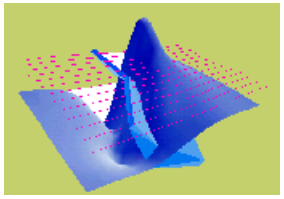




Data Issues 4

EM34: 400Hz data again shows still the conducting zone in the centre of the transect but now the area is narrower and the resistivity in the centre is also higher.





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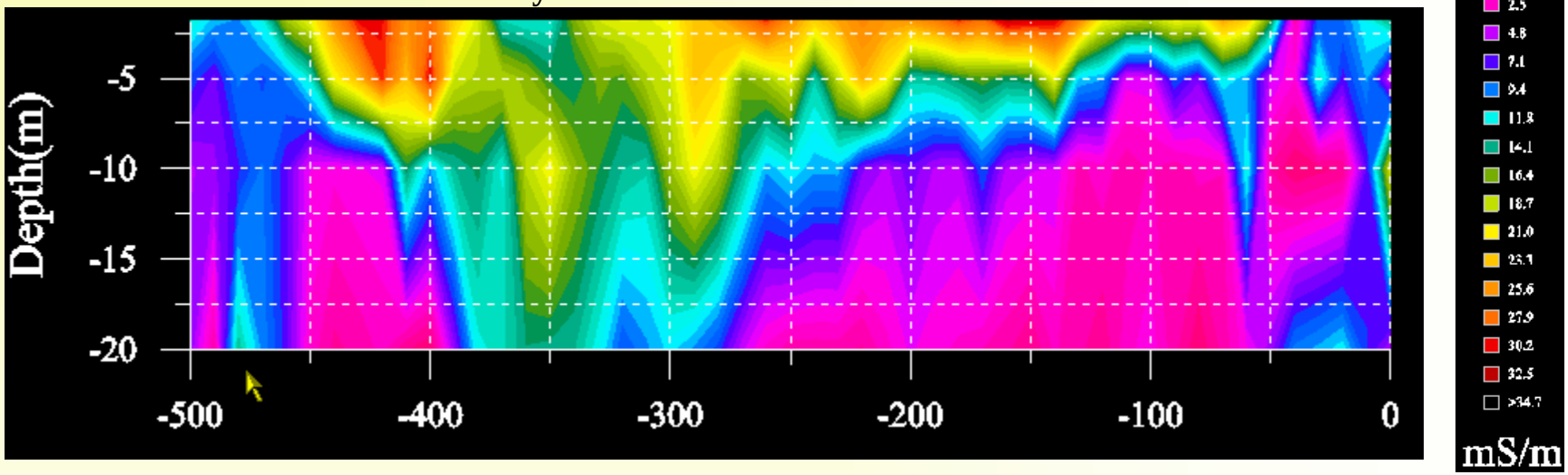
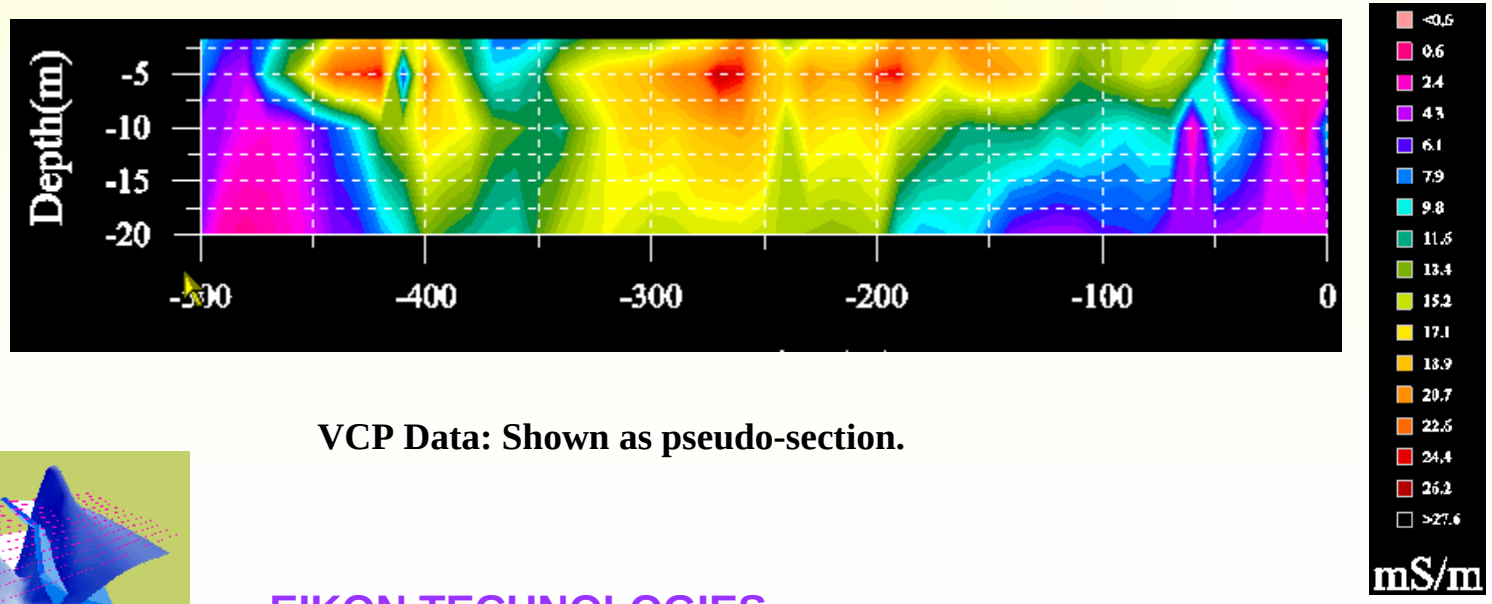
Data Issues 5

HCP Data: Shown as pseudo-section. This is simply a data image. Converting ½ separation to depth for each data point and display here as apparent conductivity.





VCP Data: Shown as pseudo-section.

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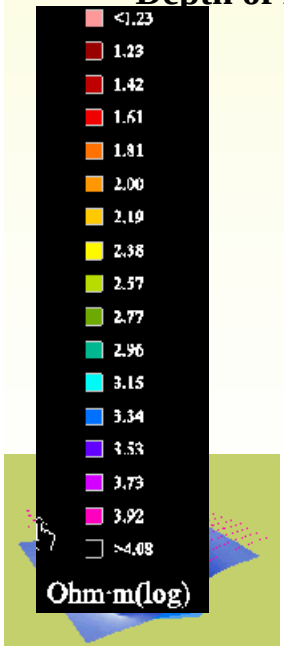
Inversion Results I

inversions using both the HCP and VCP data.

Depth of Investigation Set to 80m. Log Apparent Resistivity vs Depth

Depth of Investigation Set to 60m. Log Apparent Resistivity vs Depth



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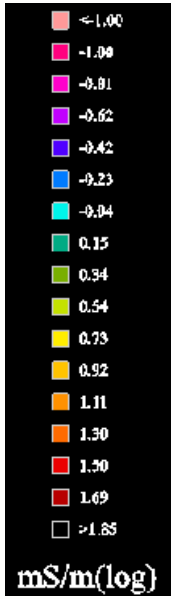
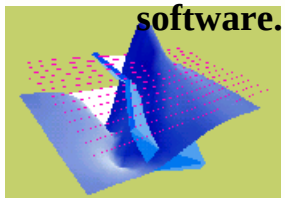
Inversion Results II

Depth of Investigation Set to 60m. Log Apparent Conductivity vs Depth



The 60m depth inversion was done with coarser resolution. The 80m inversion was done with finer resolution but joining adjacent cells if of similar resistivity (within a tolerance). The inversion was done using a Conjugate Gradient Smooth Inverse technique inverting only for resistivity. This type could also invert for susceptibility and we have also a Linear Regression technique and a standard Occam technique.

The objective here is not to give you a final interpretation but rather to indicate the capabilities of the software.



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