Contrasting 3D visualisation of different OSI data types with more standard 2D representation

Dr J Stevanovic and Dr J Palmer

Abstract

During an OSI, inspectors should expect to have access to certain types of data for an Inspection Area (IA) prior to deployment, irrespective of where on Earth the OSI occurs. Satellite and aerial imagery, cartographic maps, digital elevation models and geological maps are all data types that can be found for almost any part of the planet prior to OSI deployment. We explore how to visualise such baseline datasets in 3D to support of the Inspection, from pre-deployment through to entry into country. In an OSI, there are four main scenarios where this type of data visualisation is important:

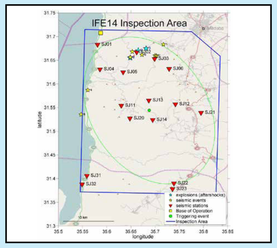
1. Planning prior to Point of Entry procedures
2. Mission planning and logistics during the OSI
3. Visualisation of treaty-relevant data
4. Producing briefing materials for all stakeholders

In this poster, we present a detailed exploration of how best to represent these data in both 2D and 3D environments. We contrast the power of visualising such data in a 3D environment to standard 2D representation of the same data, using the commercial software GeoVisionary, developed by the British Geological Survey and Virtalis Ltd. Ultimately, we discuss the potential benefits of adopting GeoVisionary, or a similar tool, into the inspector toolkit.

Considerations and methods

- Most important thing to remember is that tools of this kind should make the inspectors' job easier
- The raw data from a technique is not the best way to visually present data
- Intelligent integration of different data types allows the human eye to pick out anomalies
- These considerations should be used to guide how the data is displayed
- This will lead to the generation of various data products
- This may involve some combination of simplification, complexification or basic rendering
- There are limitations to displaying data in two-dimensions
- Displaying data products in three dimensions allows more complex, multi-variate data to be displayed in an easily digestible format
- Regardless of the data quality without adequate means to display it, it will be of little use to the Inspection Team
- We recommend that the PTS and other technical experts review the data products that would be generated during an OSI and consider how they might best be displayed to add the most value

Complex Data, Simple Data Product



SAMS aftershock data

Required variables
- Latitude
- Longitude
- Height
- Time
- Number of stations
- Error/accuracy

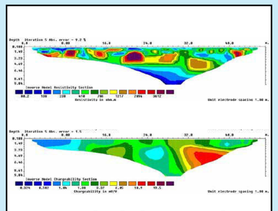
Workflow 1 – Seismic Showing simplification of data product from complex data to add value and supplement understanding

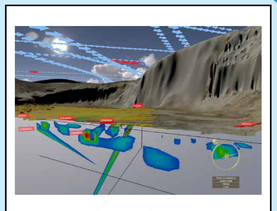
Simple Data, Complex Data Product

Workflow 2 – Imagery Showing complexification of data product from relatively simple data to show something new

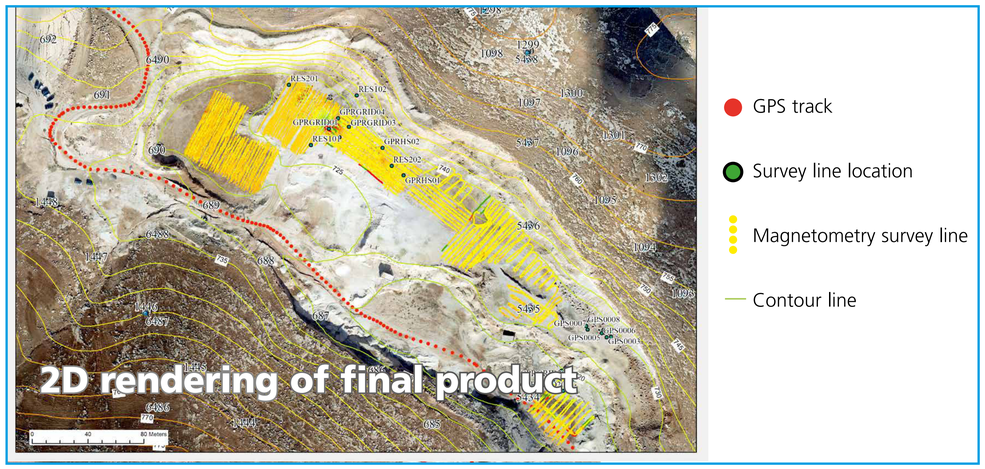
Processed for Clarity

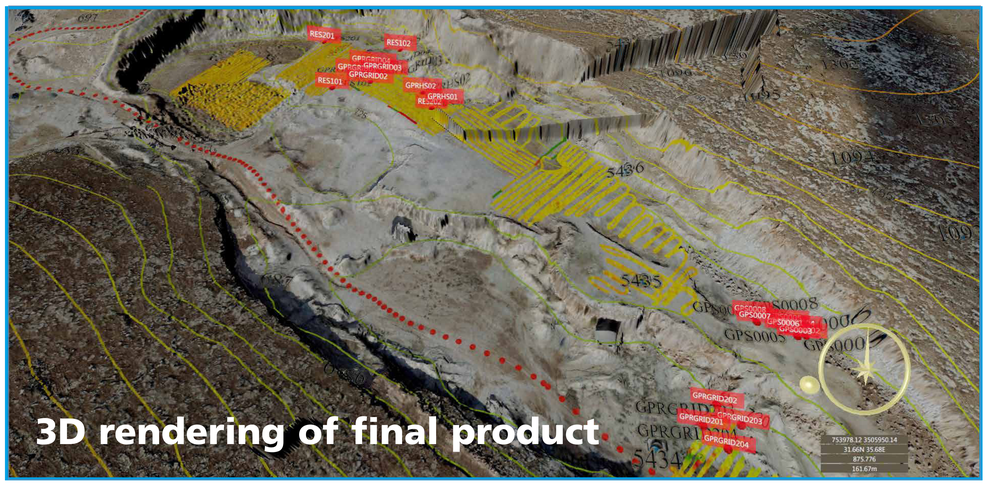

```
P18_line1.bin
        1.50
11
3
Type of measurement (0=app. resistivity,1=resistance)
0
816
 1
0
4  1.50 0.00 0.00   0.00 3.00   0.00 4.50   0.00 62.87
4  1.50 0.00 0.00   0.00 4.50   0.00 6.00   0.00 22.80
4  1.50 0.00 0.00   0.00 6.00   0.00 7.50   0.00 11.08
4  1.50 0.00 0.00   0.00 7.50   0.00 9.00   0.00 6.65
4  1.50 0.00 0.00   0.00 9.00   0.00 10.50  0.00 9.08
4  1.50 0.00 0.00   0.00 10.50  0.00 12.00  0.00 6.29
4  1.50 0.00 0.00   0.00 12.00  0.00 13.50  0.00 6.34
4  1.50 0.00 0.00   0.00 13.50  0.00 15.00  0.00 5.34
4  1.50 0.00 0.00   0.00 15.00  0.00 16.50  0.00 5.91
4  1.50 0.00 0.00   0.00 16.50  0.00 18.00  0.00 9812.52
4  1.50 0.00 0.00   0.00 18.00  0.00 19.50  0.00 10954.82
4  1.50 0.00 0.00   0.00 19.50  0.00 21.00  0.00 1491.26
4  1.50 0.00 0.00   0.00 21.00  0.00 22.50  0.00 737.60
4  1.50 0.00 0.00   0.00 22.50  0.00 24.00  0.00 5346.18
4  1.50 0.00 0.00   0.00 24.00  0.00 25.50  0.00 6142.30
4  1.50 0.00 0.00   0.00 25.50  0.00 27.00  0.00 275.18
```





Workflow 3 – Resistivity Some data need only be parsed and displayed in context for its value to be realised





Dr J Stevanovic and Dr J Palmer
AWE, Aldermaston, Reading, Berkshire, RG7 4PR.

MG/36041/PME/02