

Fieldwork is expensive and geology is a three-dimensional and often complex science therefore any tool which enables a greater understanding of the geology prior to and during fieldwork and hence saves time in the field is welcome.

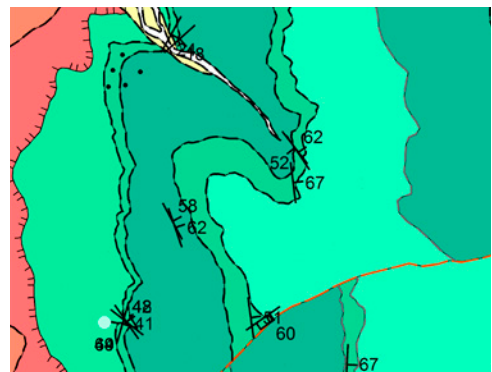
GeoVisionary enables the geologist to compile all the existing data for a field area into a three-dimensional environment and virtually visit that area before going into the field. This workflow has been termed Virtual Field Reconnaissance (VFR).

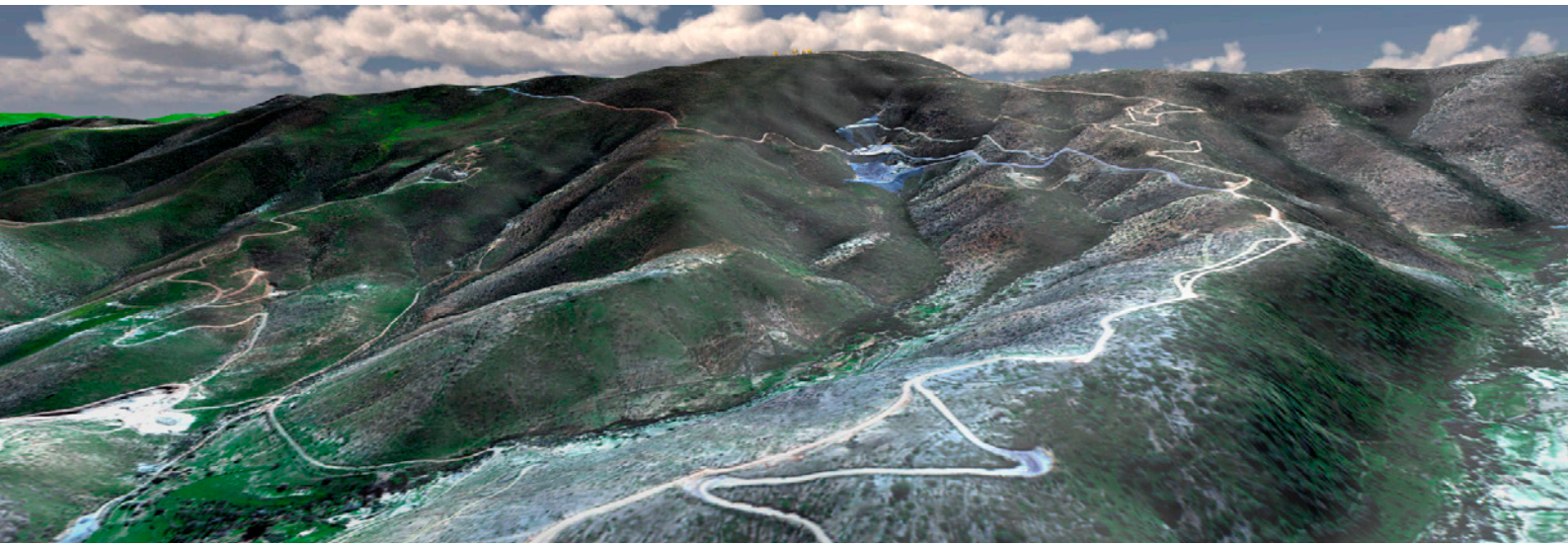
The 'geologists toolkit' within GeoVisionary allows the geologist to record their interpretations as spatially referenced and attributed lines, points and polygons, which are then easily transferable to digital field systems. Tools such as the '3-point plane', 'orientated dip surfaces' and 'profile generation tool' allow the geologist to understand the three-dimensional structure of an area and form ideas for the underlying 3D geological model of an area to be mapped.

To demonstrate this the BGS worked alongside SERNAGEOMIN to carry out VFR interpretation and accompanying fieldwork for an area in Chile which had recently been mapped. It was found that the VFR approach allowed for an improved geological interpretation which allowed targeted field work.

The challenge

- Demonstrate to the Chilean Geological Survey, SERNAGEOMIN, the use of GeoVisionary for geological mapping in the complex areas of Cerro Negro and El Trapiche in the Ovalle regions of Chile.
- Make use of VFR for both the pre-field interpretation and in the field office to help target the fieldwork for the following day.





- To generate 'check points' where the VFR interpretation could be assessed in the field, the accessibility of these points was assessed in GeoVisionary also.
- Use GeoVisionary as a tool to communicate the field work to colleagues within SERNAGEOMIN.

Key benefits

- The GeoVisionary environment allows the Geologist to virtually visit the field area and make their interpretation before going into the field meaning that the geologist goes into the field with a good understanding of the underlying geological model to which they are going to map.
- The GeoVisionary Geologists toolkit allows for the geological interpretation to be captured as attributed shapefiles ready for export into GIS systems used for field data capture.

- Generation of field targets to focus the field effort
- The ability to load topographical and high resolution imagery on top of a DEM allows access routes to be assessed in areas where access is difficult.

Further information

<http://www.bgs.ac.uk/research/environmentalModelling/3dVisualisation.html>

<http://www.geovisionary.com/>

Skills and data used

- ArcGIS, Modelling, Spatial Analysis, Geology, Volcanology, 3D Visualization, image processing.
- 1m, 10m and 30m DSM, Existing geological maps, high resolution imagery: WV2 and 3, GeoEye, Quickbird, Spot 6. Lower resolution imagery: Sentinel 2, ASTER, Landsat 8.

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