PROXIMA

March 15

GEO-DATA projects

2017

Geophysical and Geographical data processing and Interpretation by Proxima R&D s.r.o. company. Gravity, magnetics, radiometrics, seismic and LiDAR data were processed by Proxima technology. Spatial databases of automatically extracted and interpreted features were delivered along with GeoProxima software.

Case studies

Project: **Lidar, aerial and satelite imagery data evaluation and processing**

Location: Slovakia (European Union)

Total area: 5000 km^2 (detailed area shown here is approx. 100 km^2)

Outputs:

- Spatial database of objects of different land cover classes, terrain edges and water bodies
- Attribute characterisation of vegetation, terrain edges and water boundaries
- Spatial database of objects of individual groups of vegetation on several levels-of-detail
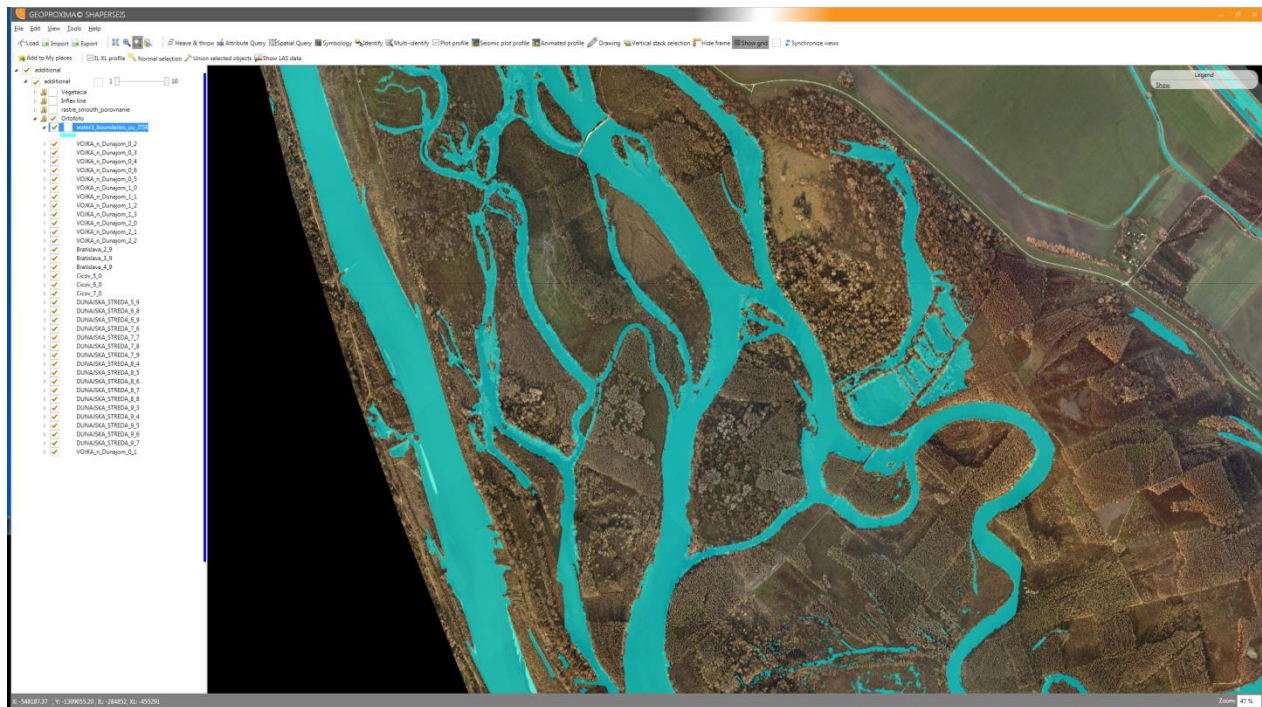- Identification of erosional features

Delineated water areas overlayed on composite aerial imagery:
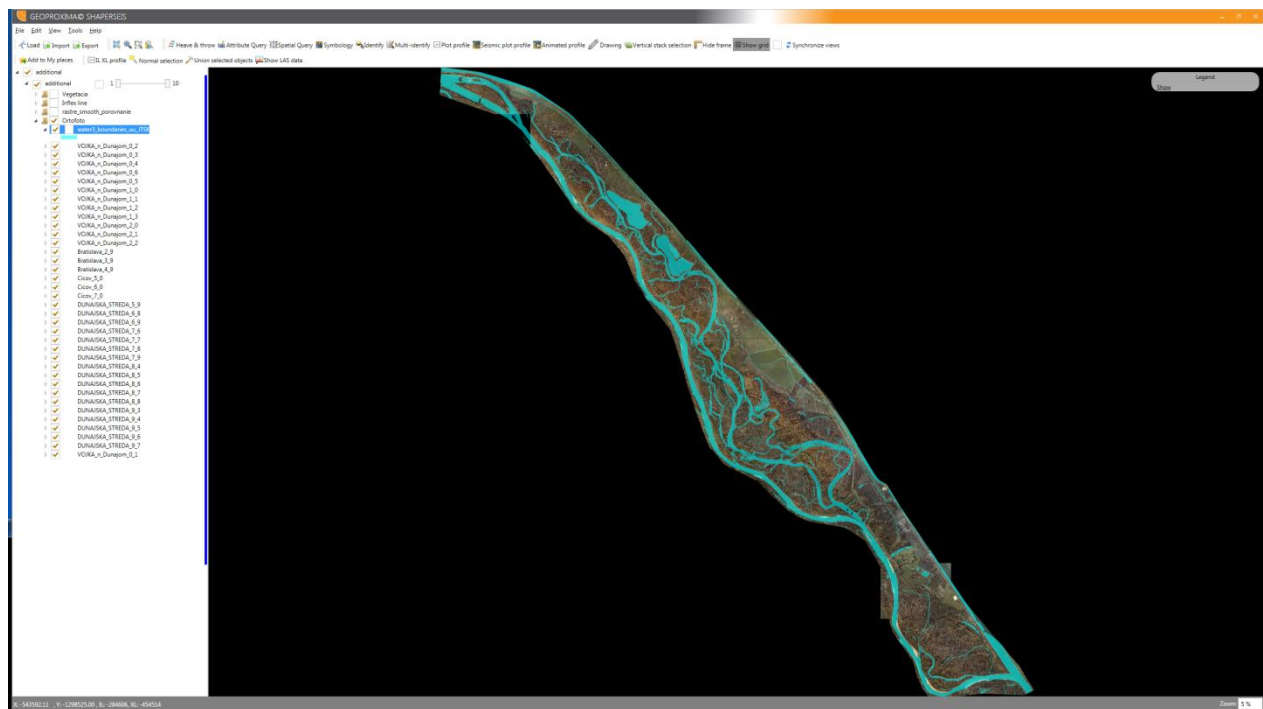
Land cover classification including water areas:
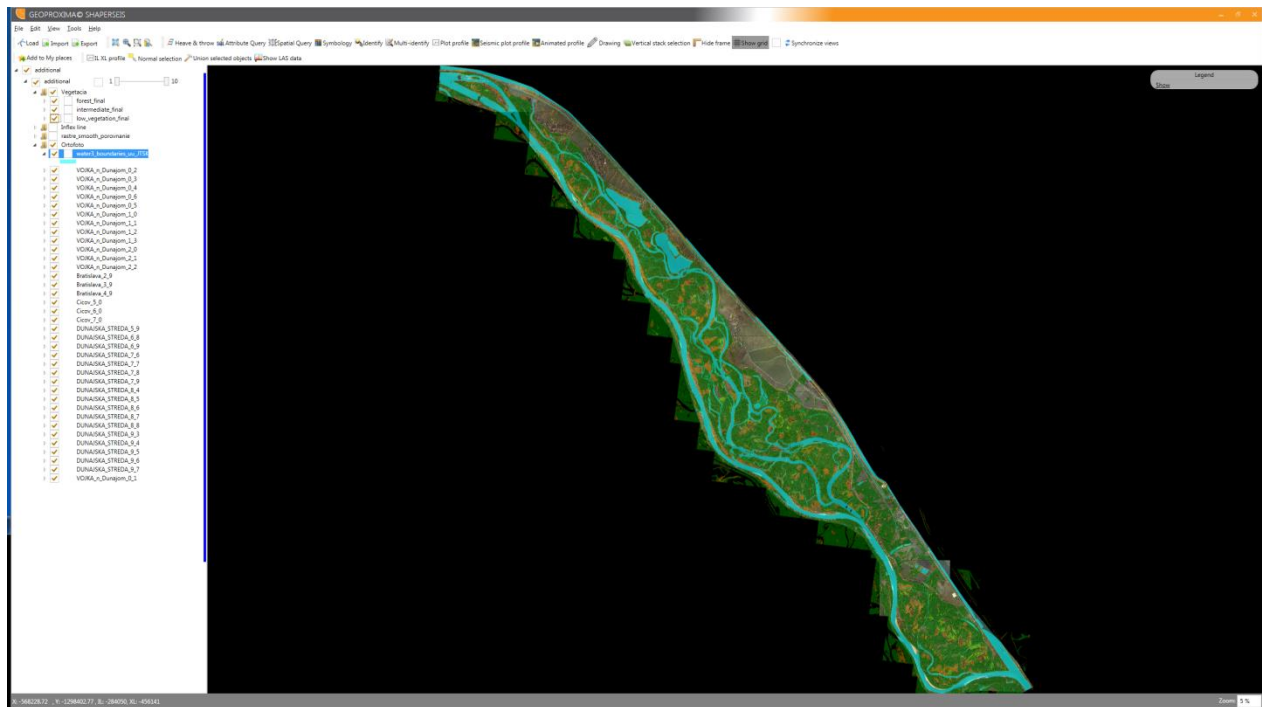
Detailed view on delineated water areas stored as polygonal layer and overlayed on top of aerial imagery composite mosaic:
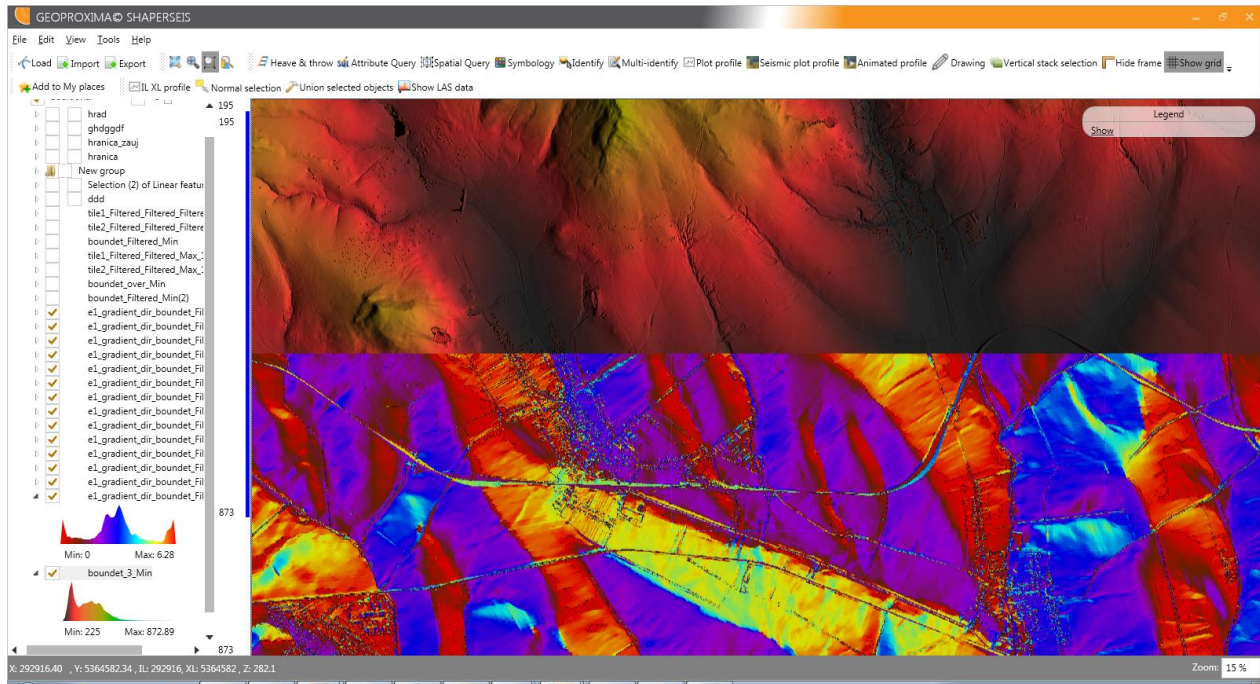
Detailed view on delineated polygonal objects of different types of vegetation and water areas overlayed on top of aerial imagery composite mosaic:
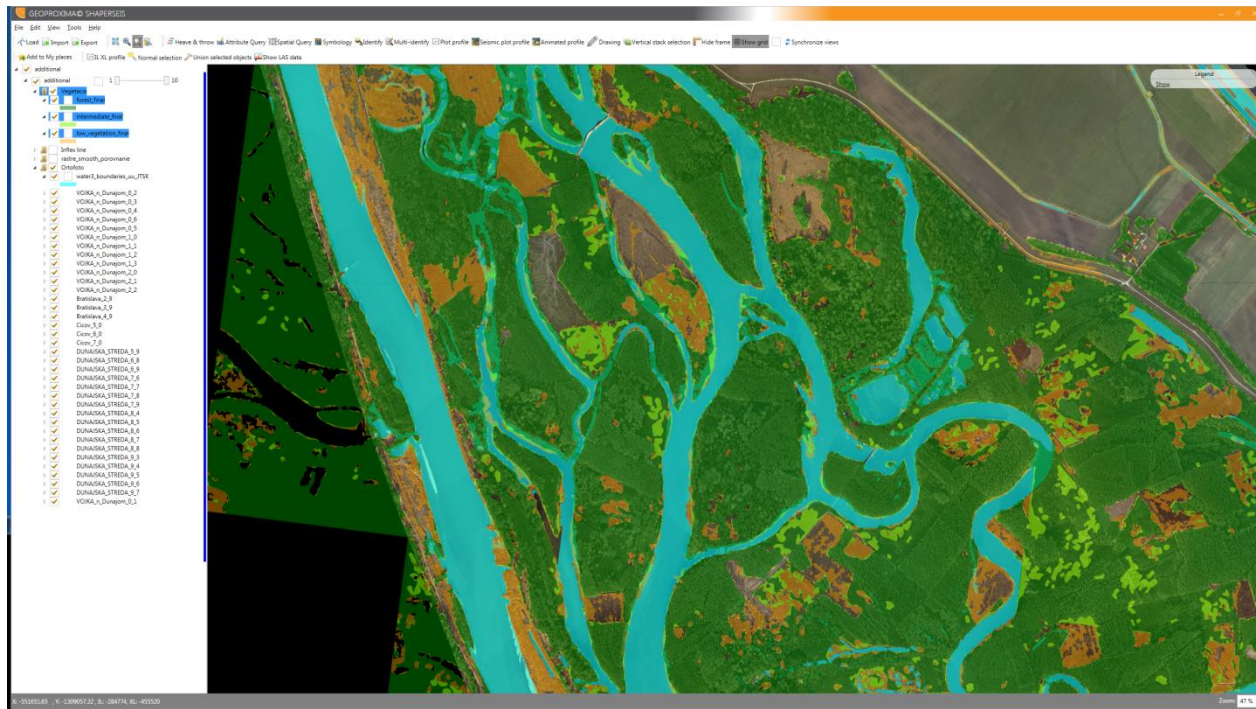
Digital elevation model over a forested area and slope of georelief evaluation:
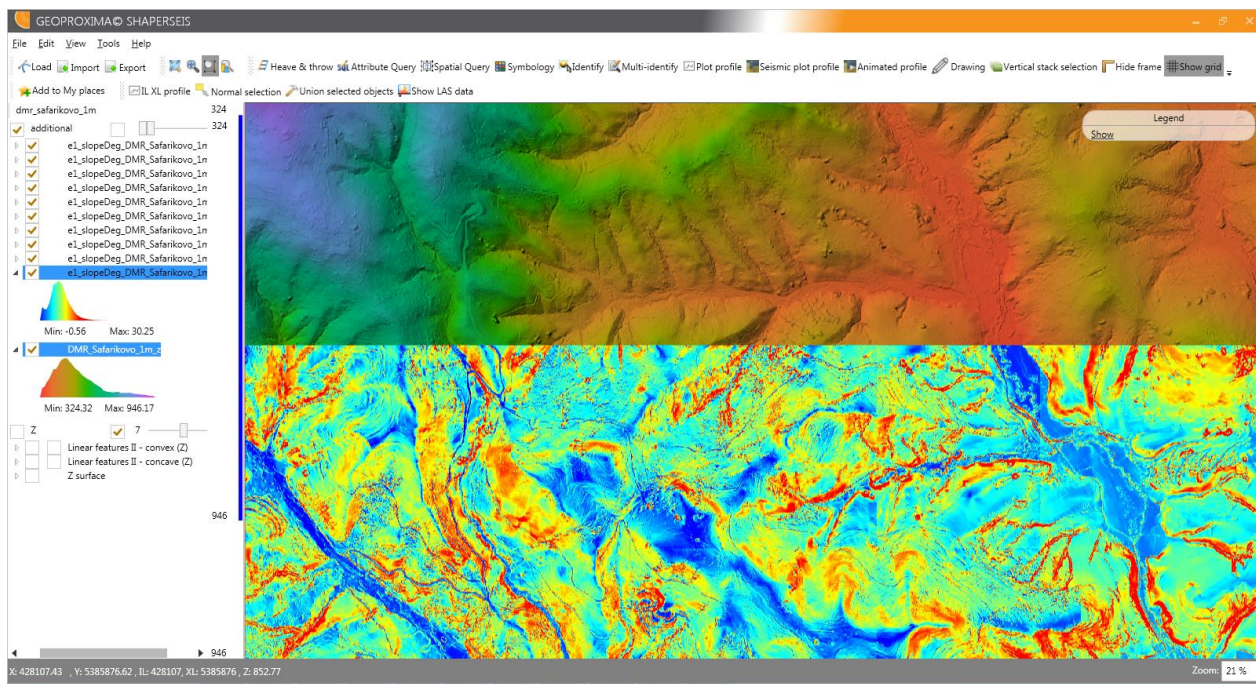
Digital elevation model over an agricultural area and orientation of georelief evaluation:

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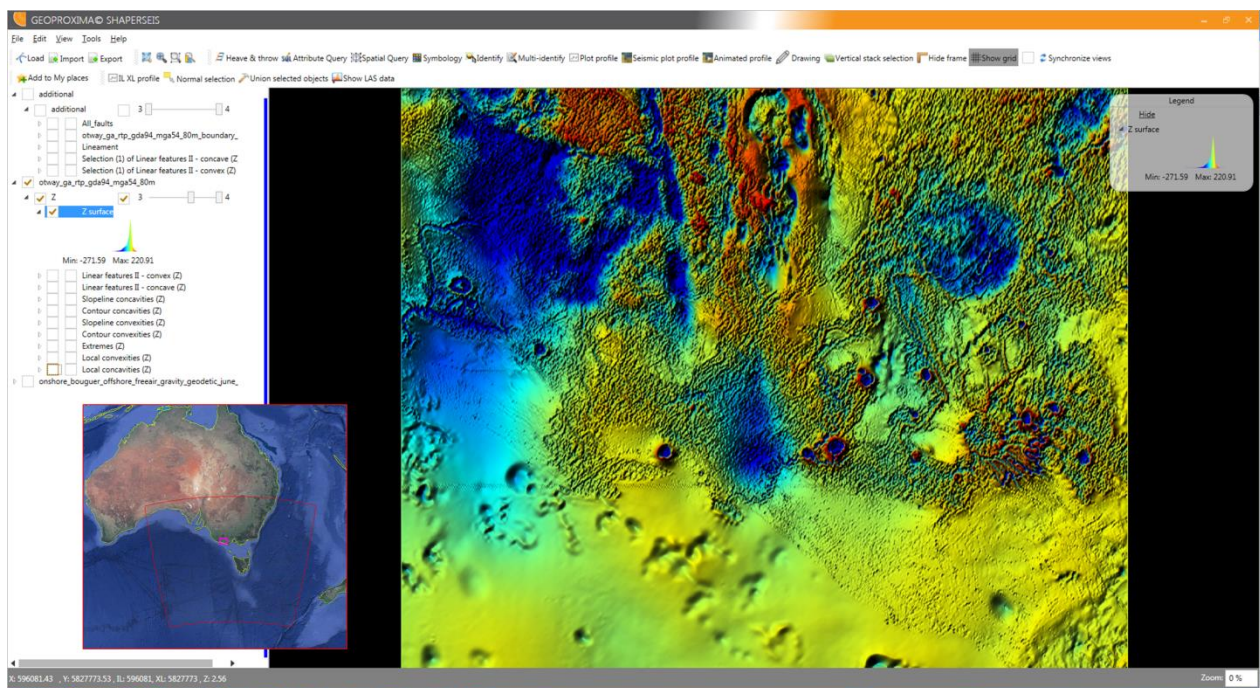## Project: **Interpretation of Magnetic and Gravity data**

Location: Victoria (Australia)

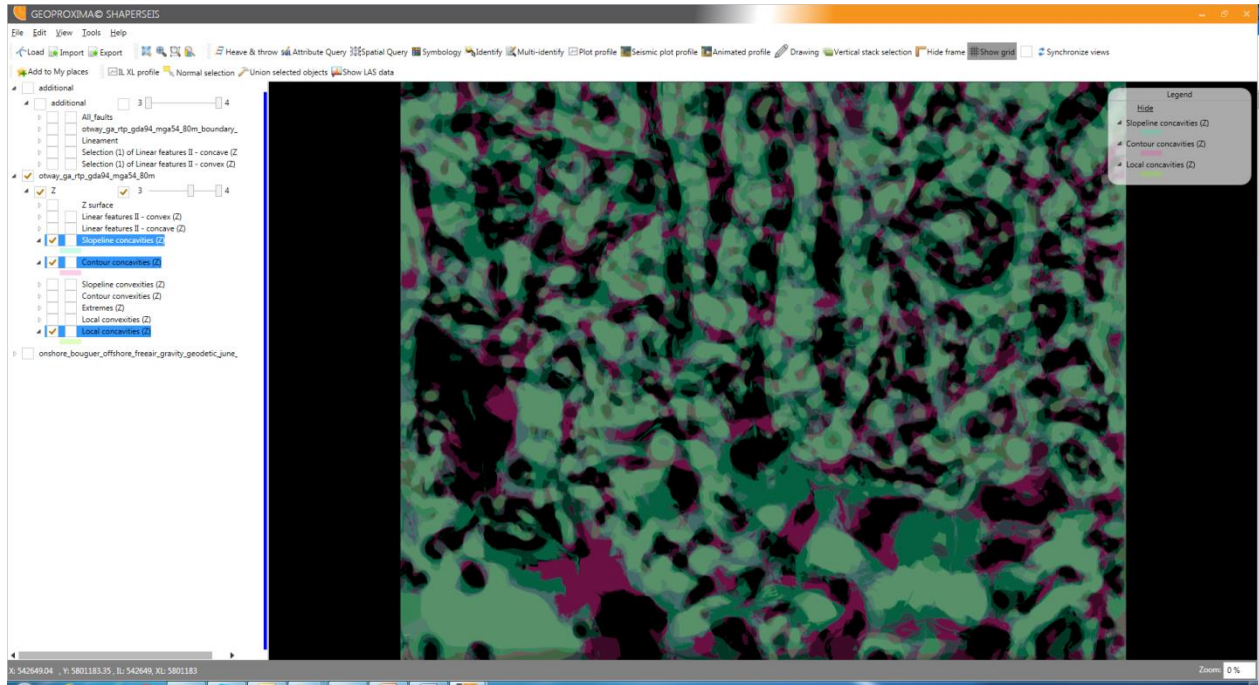Total area: 6.8 million km^2 (detailed area shown here is approx. 15 000 km^2)

Outputs:

- Spatial database of convex/concave features, convex/concave linear features
- Attribute characterisation describing geometry, zonal statistics and spatial properties of features
- High/Low frequency features extraction
- Identification of linear features according to spatial correlation of feature boundaries
- Regional tectonic database QC
- Gravity and Magnetic sources delineation, linear features interpretation

Subset from regional magnetic dataset coloured by TMI values:

Example of Convex and Concave features extracted from TMI grid:

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Project: **Interpretation of Airborne Gravity, Gradiometry and Magnetics**
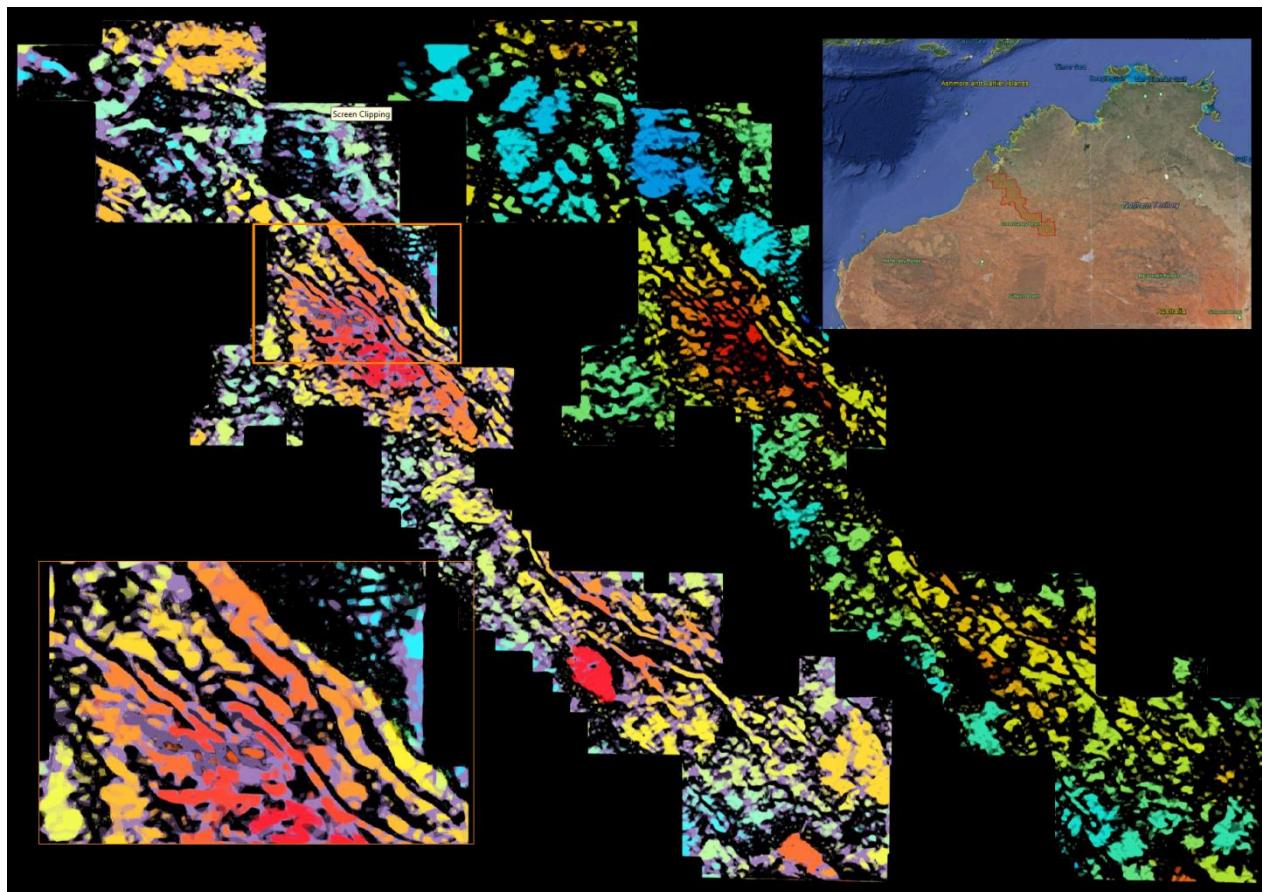
Location: Western Australia (Australia)
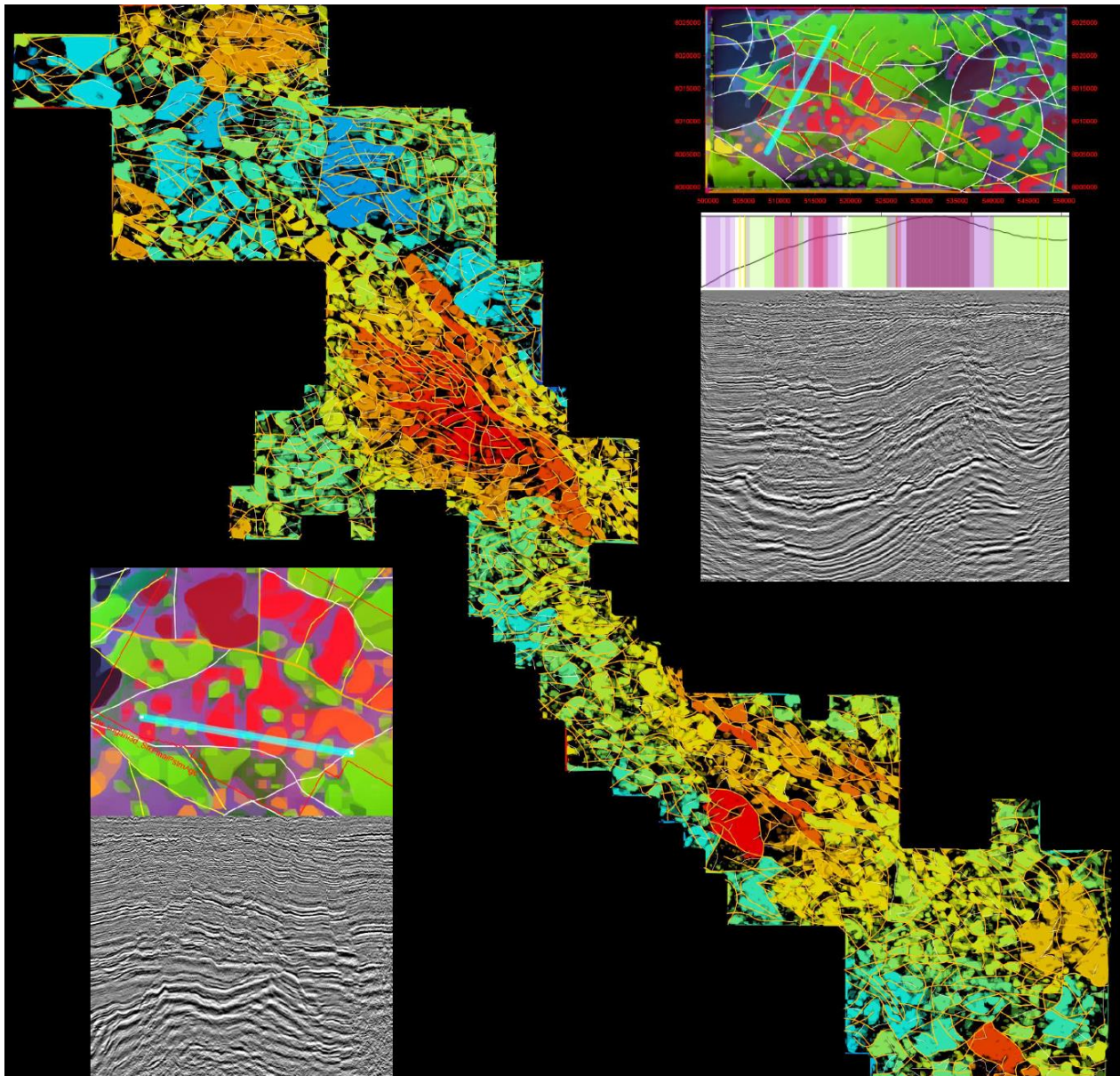
Total area: 40 000 km^2

Outputs:

- Spatial database of convex/concave features, convex/concave linear features
- Attribute characterisation describing geometry, zonal statistics and spatial properties of features
- High/Low frequency features extraction
- Identification of linear features according to spatial correlation of feature boundaries
- Integrated interpretation of various geophysical and geological data
- Prospect areas evaluation
- Existing interpretation QC

Convex and concave zones on several levels of detail colour coded by the gravity values:

Spatial database is queried and extracted objects are used to guide the interpretation of faults. Detailed assessment of interpretation is possible on areas of existing 3D seismic data:

More detailed view on interpreted faults and their spatial relation to fused convex gravity objects extracted by Proxima technology:
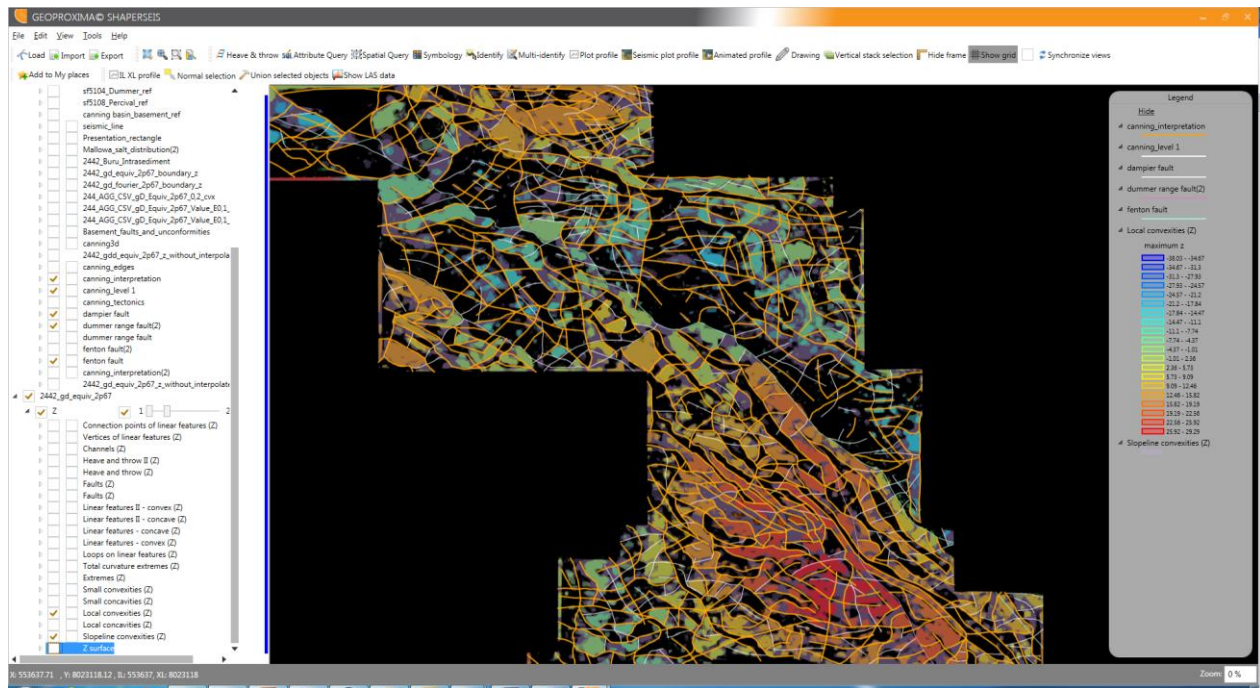
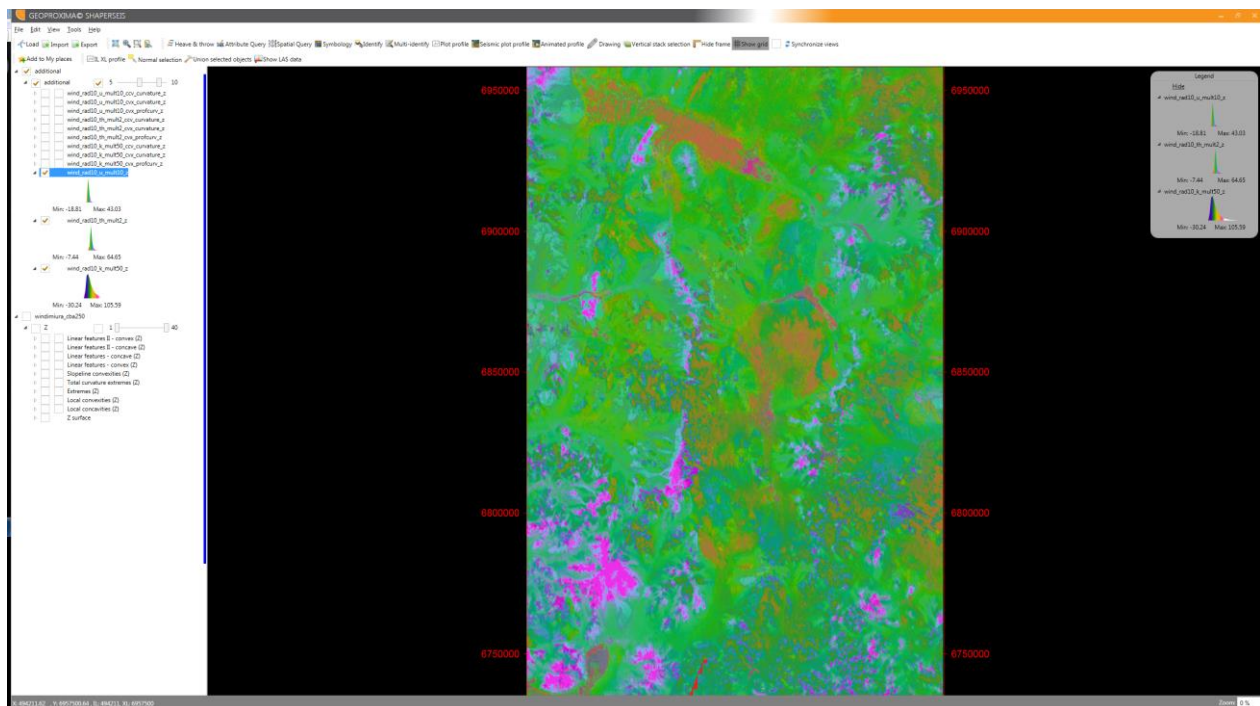Project: **Interpretation of Gravity, Magnetics and Radiometrics**

Location: Western Australia (Australia)

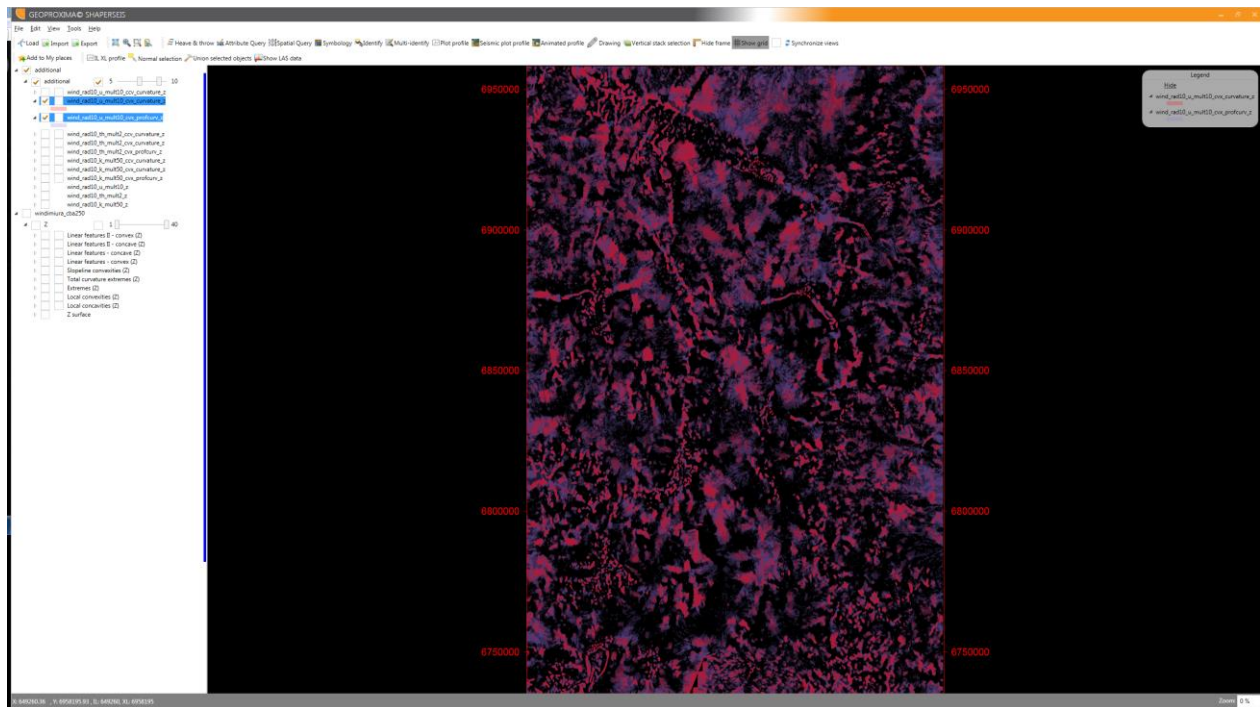Total area: 4.8 million km^2 (detailed area shown here is approx. 33 000 km^2)

Outputs:

- Spatial database of convex/concave features, convex/concave linear features
- Attribute characterisation describing geometry, zonal statistics and spatial properties of features
- High/Low frequency features extraction
- Identification of linear features according to spatial correlation of feature boundaries
- Spatial correlations of identified zones from U, Th, K grids
- Identification of possible extensions of mineral resources zones
- Delineation of possible extensions of surface geology zones to subsurface
- Integrated interpretation of Gravity, Magnetics, Radiometrics, Minerals and Geology maps

Blended display of U, Th, K grids coloured by separately adjusted color schemes:

Queried spatial database of convex objects extracted from K grid:

Convex features from gravity data extracted by Proxima are imported into WA government website and overlayed on radiometrics composite display:

Project: **Interpretation of Gravity and Magnetics**

Location: Slovakia (European Union)
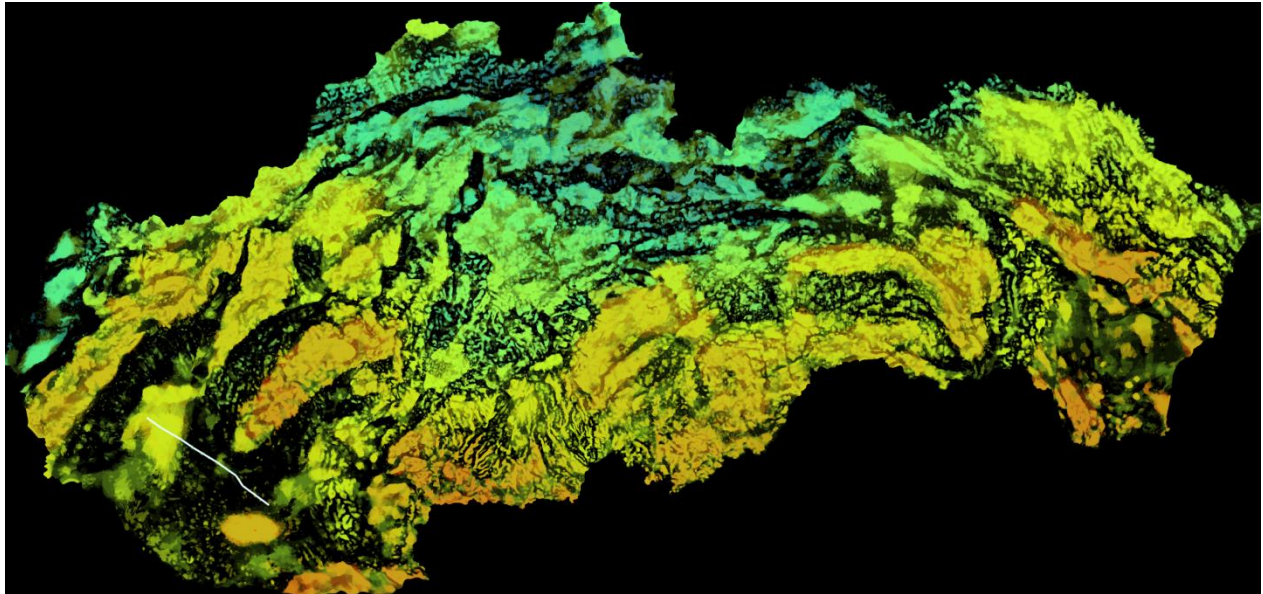
Total area: 60 000 km^2

Outputs:

- Spatial database of convex/concave features, convex/concave linear features
- Attribute characterisation describing geometry, zonal statistics and spatial properties of features
- High/Low frequency features extraction
- Identification of linear features according to spatial correlation of feature boundaries
- Structural interpretation
- Identification of different geological units
- Delineation of buried volcanic objects
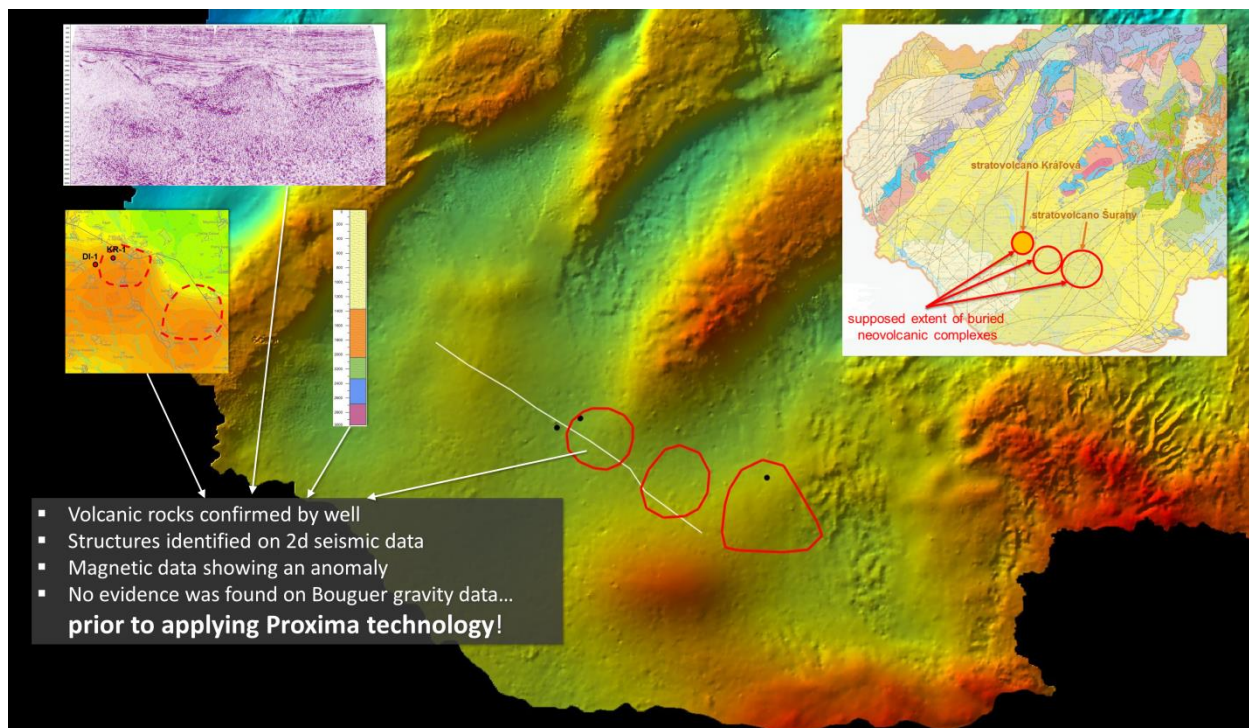- Correlation with seismic sections, borehole data, integrated interpretation
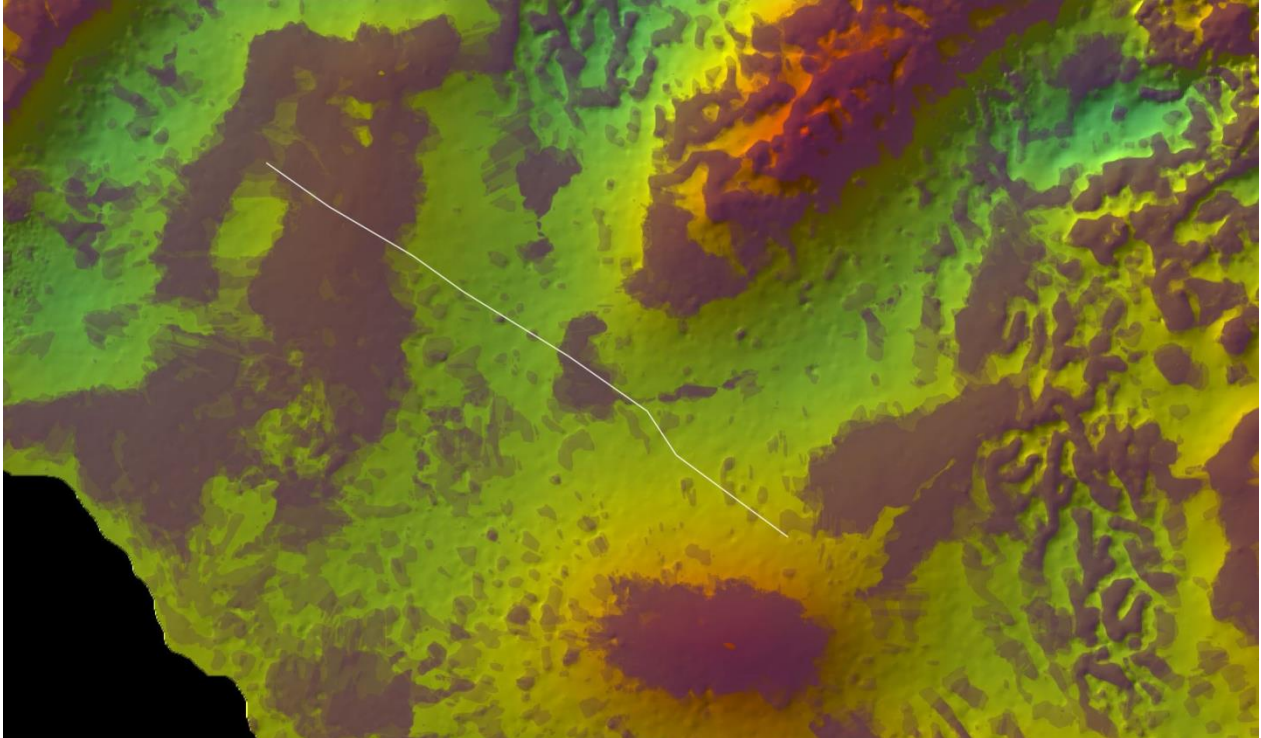
Bouguer gravity map:
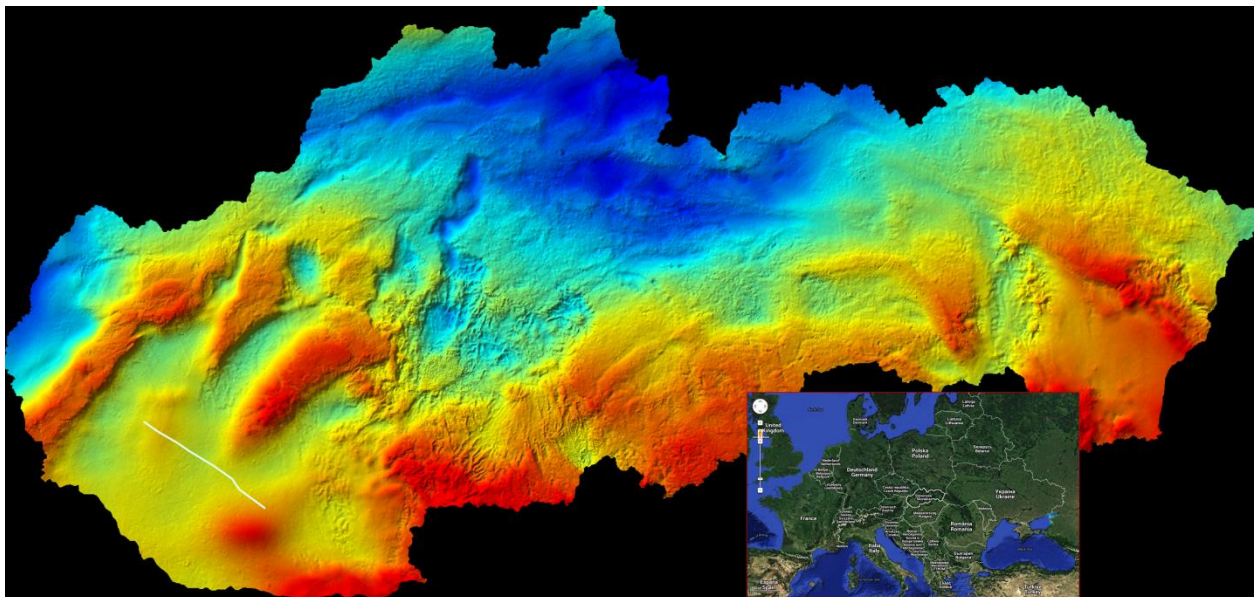
Delineated gravity zones identified by fusion of multiple spatial and attribute query results:

Additional data used to confirm identified buried volcano object:

- Volcanic rocks confirmed by well
- Structures identified on 2d seismic data
- Magnetic data showing an anomaly
- No evidence was found on Bouguer gravity data...
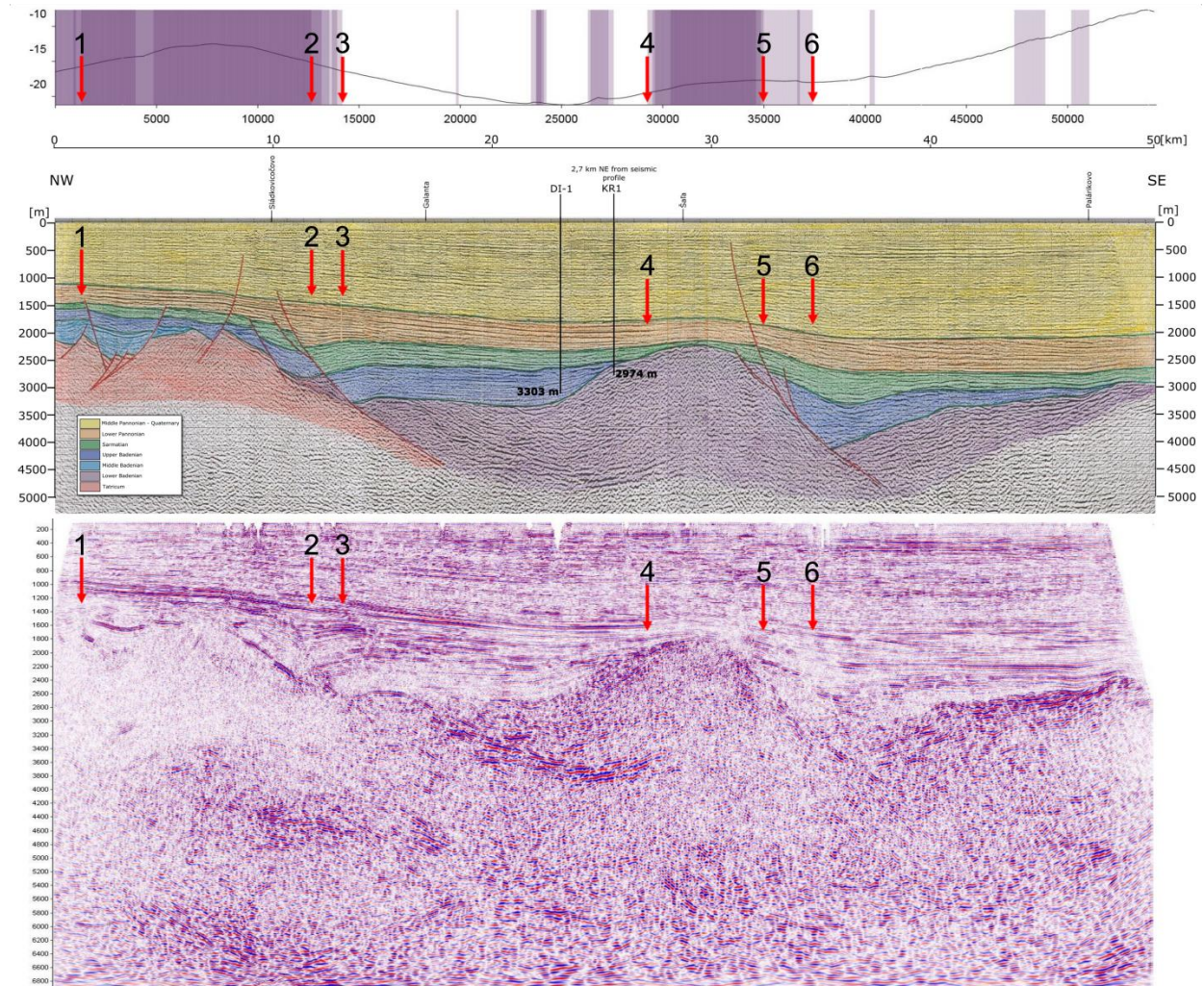 **prior to applying Proxima technology**!

Convex features delineating mostly positive gravity anomalies:

Gravity profile with marked convex zones is compared to interpreted and uninterpreted seismic section:
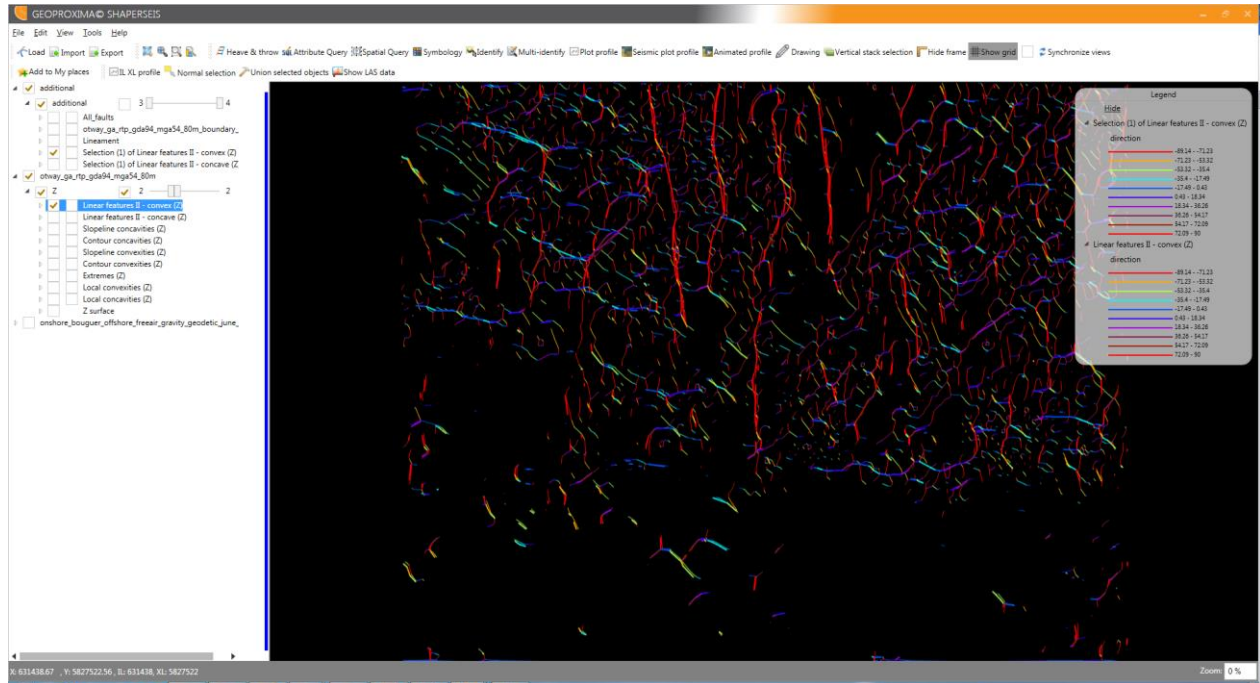
Project: **Interpretation of Magnetic and Gravity data**

Location: Victoria (Australia)

Linear features extracted from TMI (RTP) data on several levels of detailed color coded by the direction:

Project: **Interpretation of Gravity, Magnetics and Radiometrics**

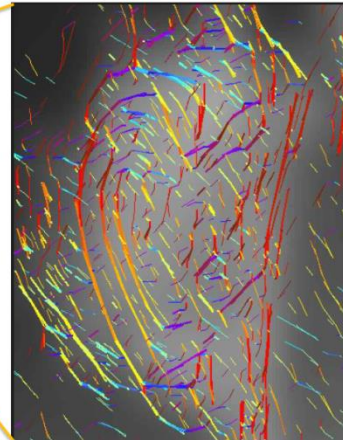Location: Western Australia (Australia)

Another example of complex evaluation of data.

Some linear features from magnetic anomalies correlate with high gravity values.

Concave linear features are coloured by their orientation.

All levels of detail are shown on top of the Gravity grayscale map.

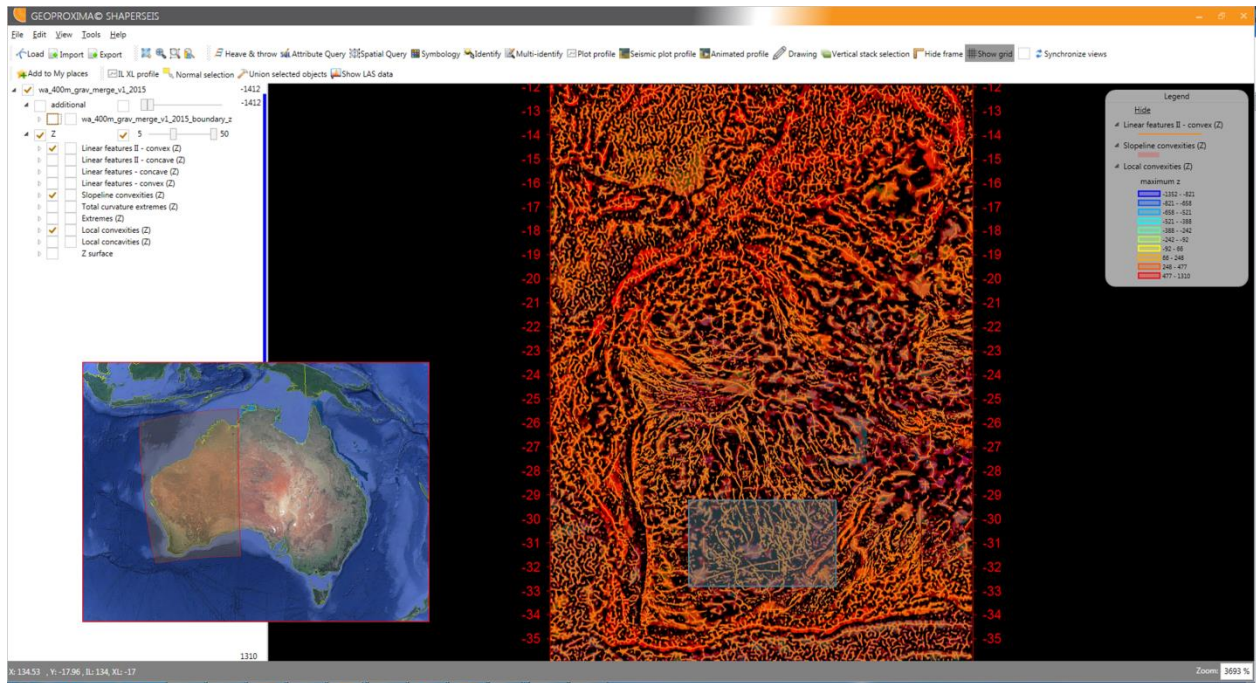## Project: **Interpretation of Gravity and Magnetics**

Location: Western Australia (Australia)

Total area: 4.8 million km^2

Outputs:

- Spatial database of convex/concave features, convex/concave linear features
- Attribute characterisation describing geometry, zonal statistics and spatial properties of features
- High/Low frequency features extraction
- Identification of linear features according to spatial correlation of feature boundaries
- Regional tectonics mapping

Delineated positive gravity anomalies with overlayed convex linear features:

Detailed view:

Project: **Interpretation of Magnetics for prospect areas**

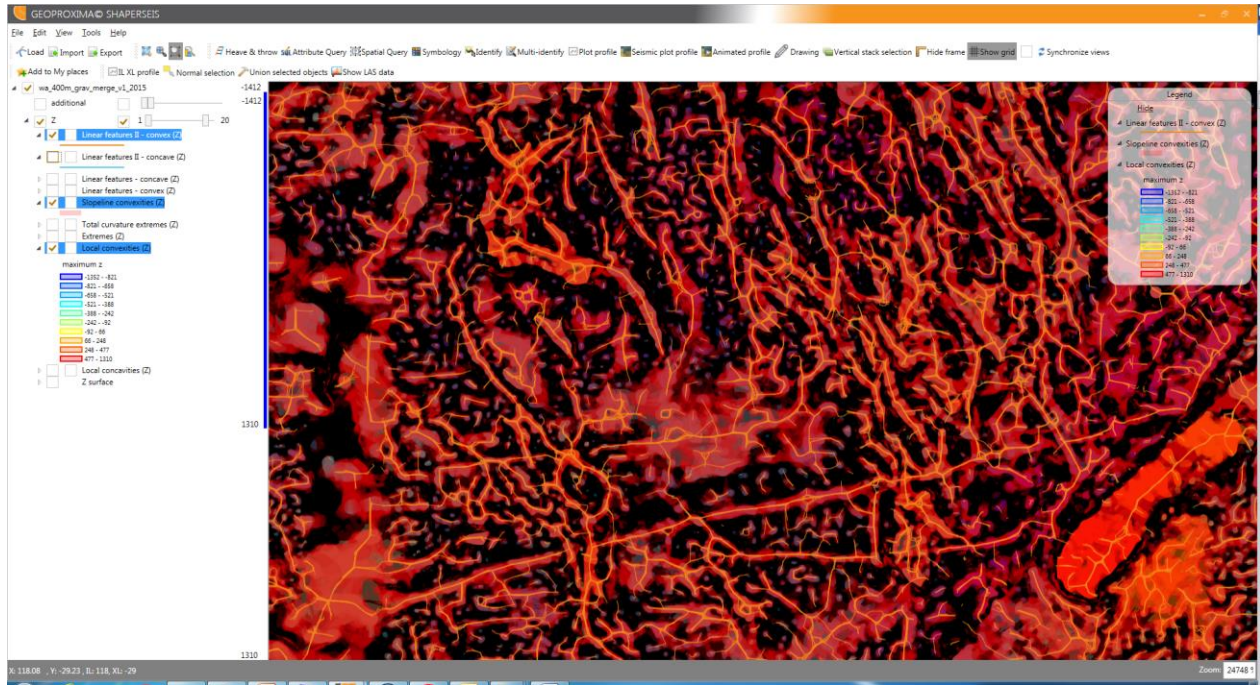Location: Nova Scotia (Canada)

Total area: 50 km^2

Outputs:

- Spatial database of convex/concave features, convex/concave linear features
- Attribute characterisation describing geometry, zonal statistics and spatial properties of features
- Features extraction on multiple levels-of-detail
- Identification of linear features according to spatial correlation of feature boundaries
- Contact zones identification
- Identification of possible continuation of mineralization zones
- Prospect zones evaluation

Delineated magnetic anomalies with overlayed on local geology and mineralization map:
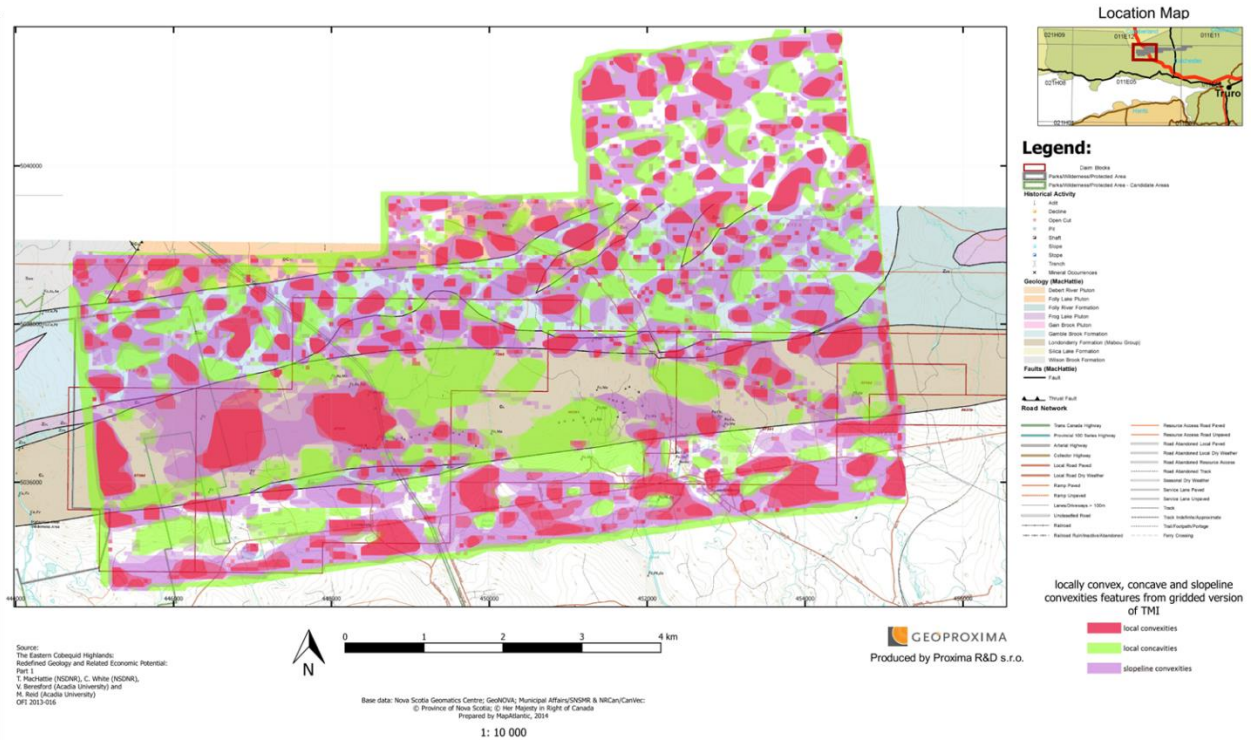
Project: **Interpretation of Gravity, Magnetics and Radiometrics**

Location: Western Australia (Australia)

Convex features from gravity data extracted by Proxima are imported into GIS package and overlayed on geological map. Several specific mineral zones correlate with convex object boundaries color coded by the maximum gravity value:
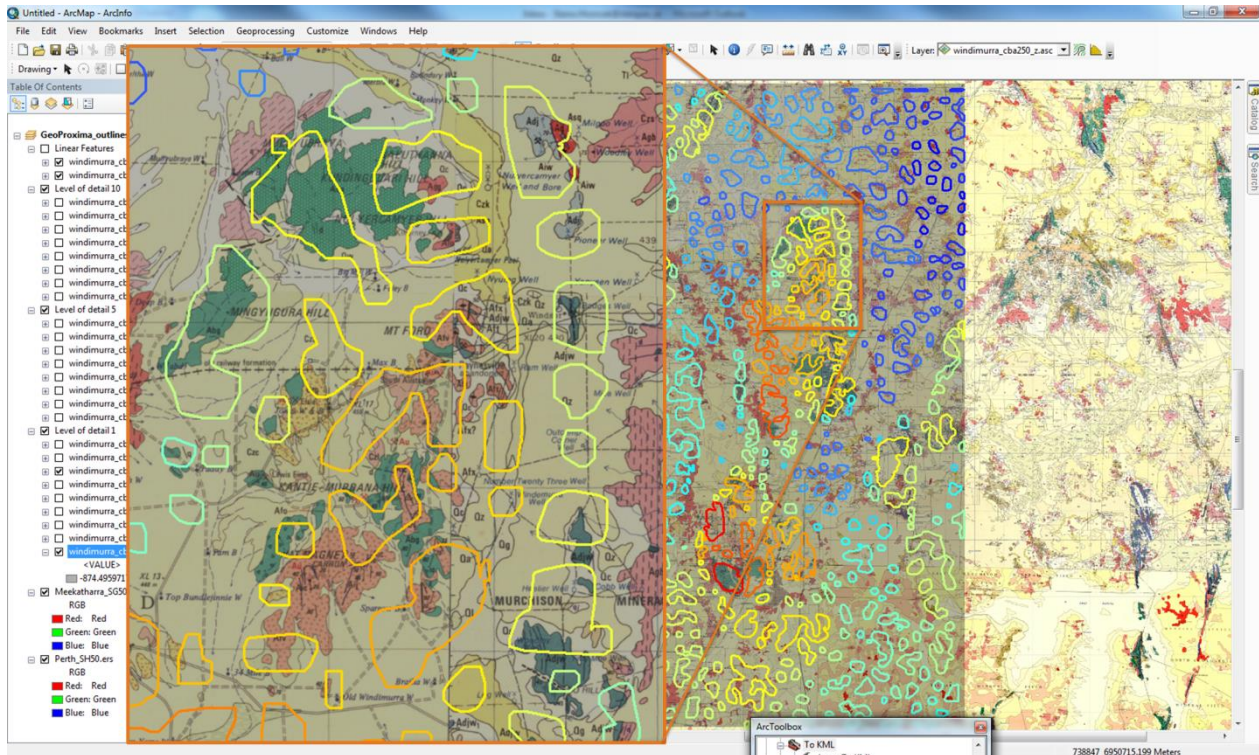
Proxima technology automatically creates spatial databases which can be viewed in GeoProxima software. Multiple tools such as Attribute query, Digitization or Optical stacking of objects are available for efiicient interpretation. All data can be exported to ESRI shapefiles, ESRI ASC grids, GeoTIF images or KMZ files. Various formats can also be imported into the viewer. GeoProxima is designed for workflows requiring investigation of large amount of data.

GeoProxima software is provided with deliverable project free of charge for a specific period of time.

GeoProxima 2D viewer: