



Utilizando ArcGIS para Geoquímica de superfície e sondagem

Geochemistry for ArcGIS

Fernanda Almeida – Executiva de Contas

Janaína Gattermann Pereira – Geóloga

José Luis Ando – Geólogo



Agenda

- Apresentação da Geosoft
- Produtos Geosoft
- O que é Geoquímica?
- Geociências e Exploração Mineral
- Geoquímica como ferramenta para exploração
- Trabalhando com dados Geoquímicos no ArcGIS
 - Superfície
 - Sondagem
- Demonstração do Geochemistry for ArcGIS



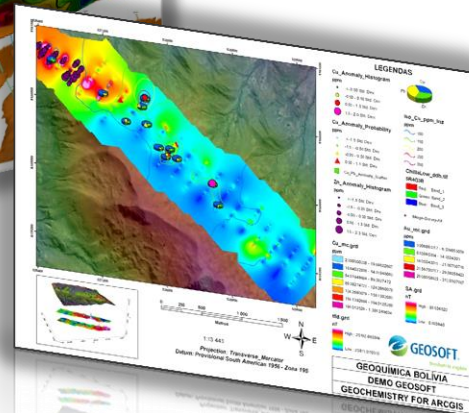
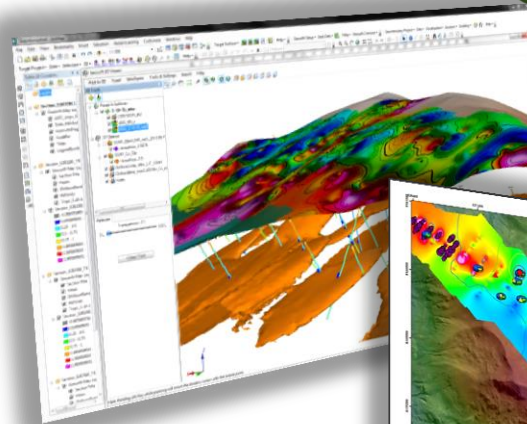
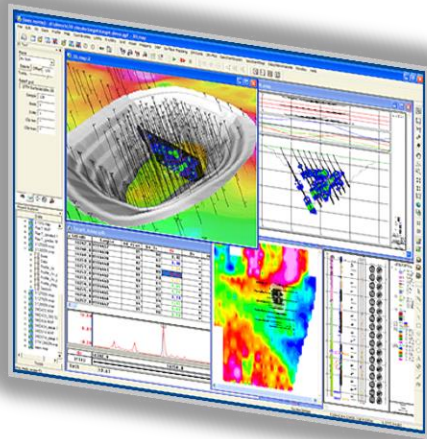
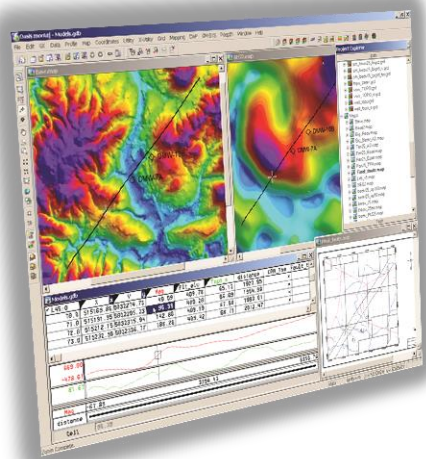
Geosoft e exploradores da Terra

Informações gerais – Empresa e escritórios



- Software e soluções para Exploração Global
- Servimos mais de 5000 clientes
- 40% de nossos recursos profissionais são geocientistas
- Suporte, treinamento e outros serviços em Português, Inglês e Espanhol.

freedom to explore™

 **GEOLOGICAL SOFTWARE**
Oasis montaj

Extensões de Geofísica

 **GEOLOGICAL SOFTWARE**
Target **GEOLOGICAL SOFTWARE**
Target for ArcGIS **GEOLOGICAL SOFTWARE**
Geochemistry for ArcGIS

O que é Geoquímica?

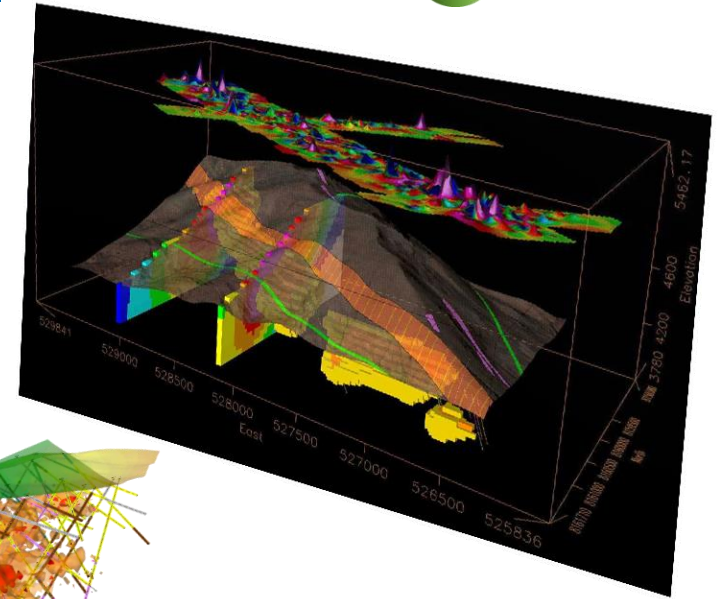
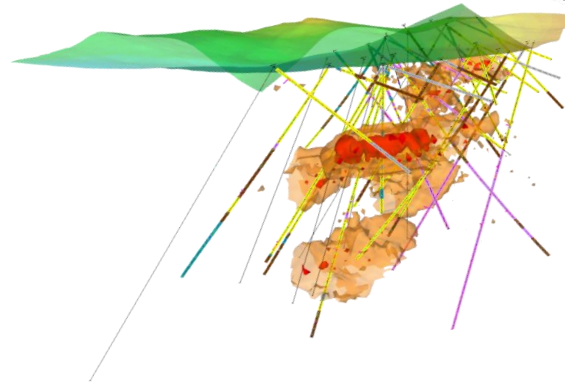


É o ramo da ciência geológica que estuda a química do planeta.

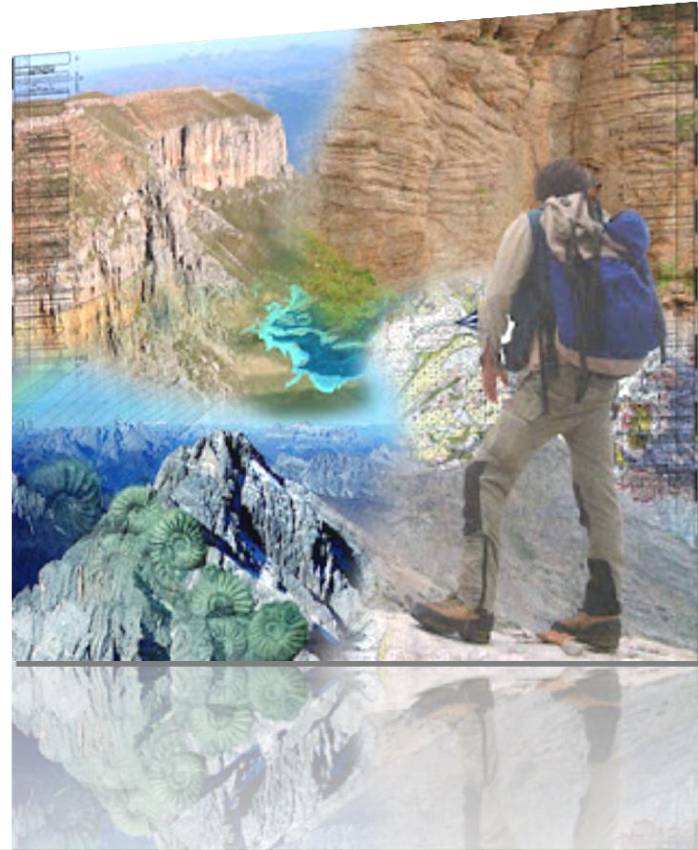
A geoquímica utiliza as leis da química para entender os processos que governam a abundância e distribuição dos elementos nas diversas partes da Terra: magmas, rochas, minerais, minérios, água, ar, etc

Fonte: <http://www.cbpm.com.br>

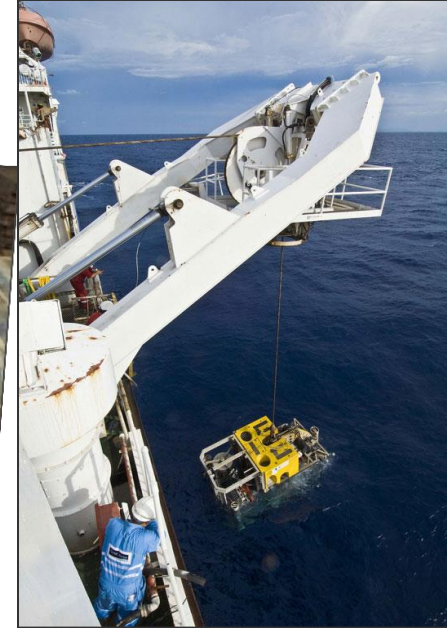
- Avanço no conhecimento científico
- Procura de novos recursos
- Dados Integrados
- Grau de confiabilidade



- Pesquisa Mineral
 - Prospecção
 - Exploração
 - Desenvolvimento

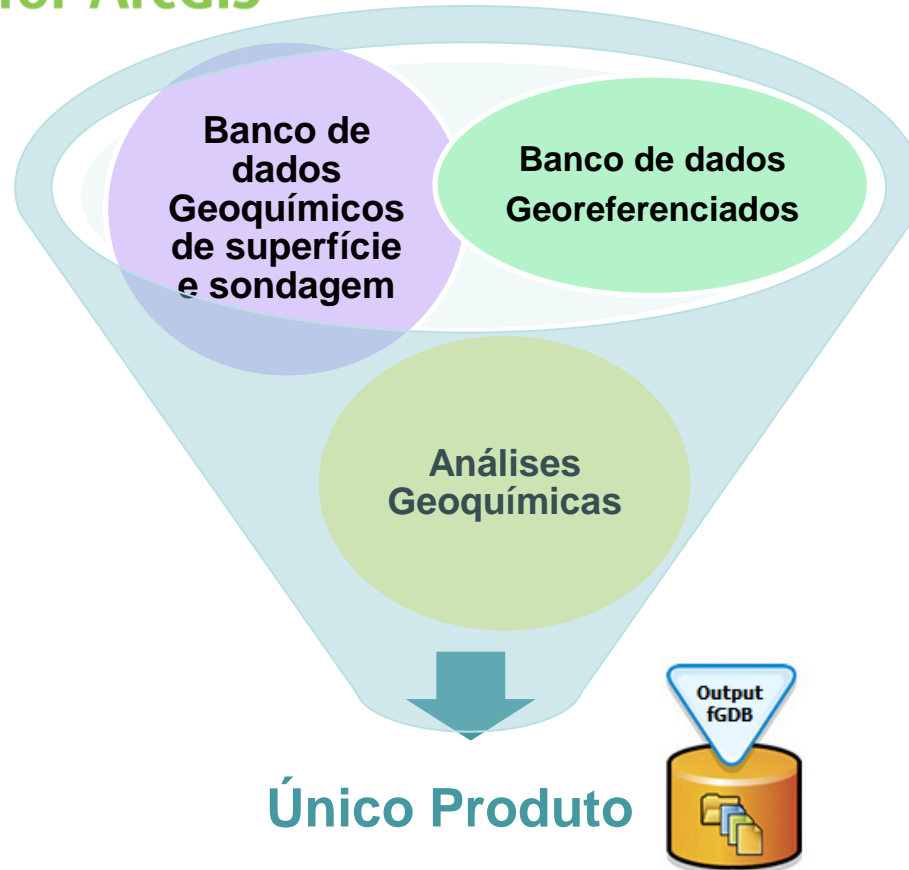


Geoquímica como ferramenta para exploração

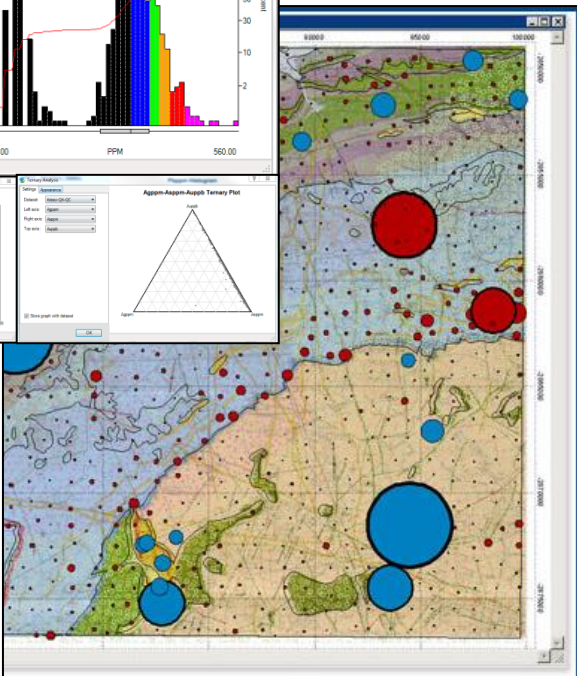
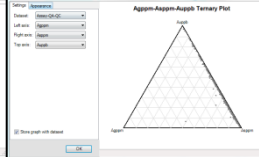
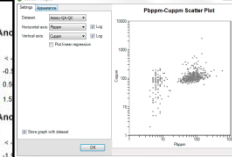
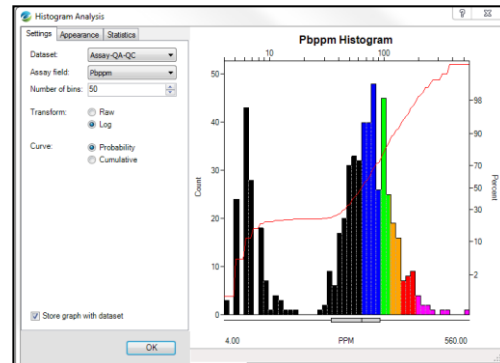
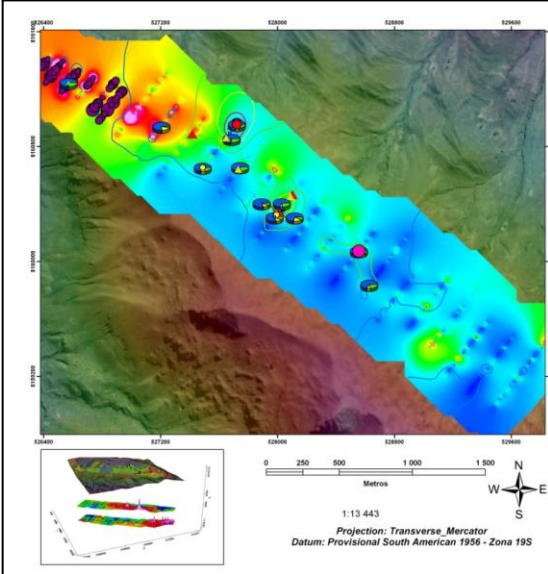


Trabalhando com dados Geoquímicos no ArcGIS





➤ Desenvolvido para visualização e análise estatística de dados geoquímicos



GEOQUÍMICA BOLÍVIA
DEMO GEOSOFT
GEOCHEMISTRY FOR ARCGIS

- Importação de dados de superfície e de sondagem

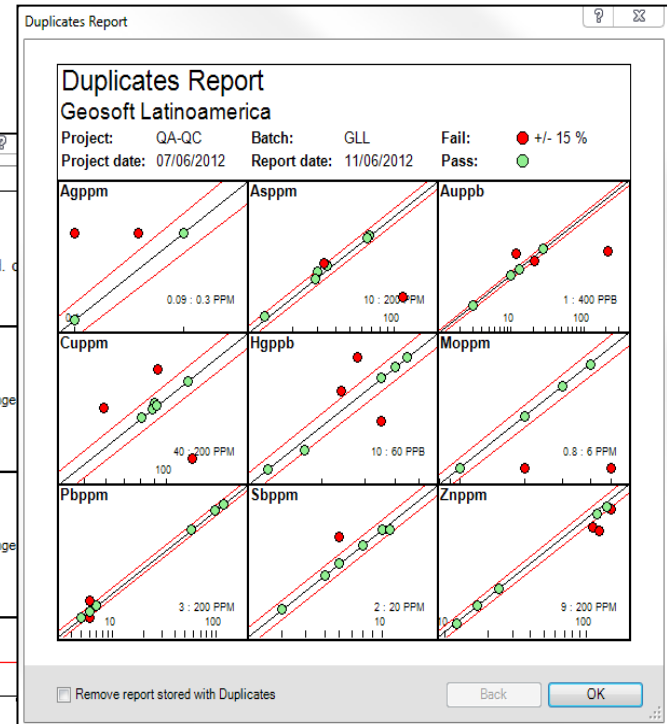
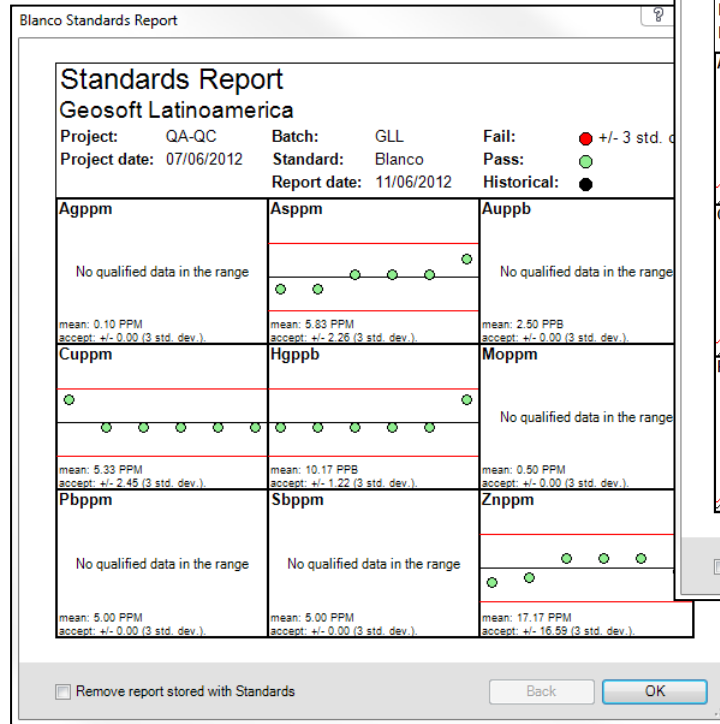
The image shows the ArcGIS Geochemistry Project interface with the 'Data' menu open. The menu options include: Import Location Data, Import Assay Data, Import acquire Data..., Import Drill-Hole Data..., Edit Survey Attributes..., Survey Coordinate System..., Edit Assay Batch Attributes, Assay Field Attributes..., Merge Location and Assay Data..., Level Assay Data..., Extract Standards, Display Standards, Extract Duplicates, and Display Duplicates. A red arrow points from the 'Import Assay Data' option to a sub-menu that lists: ASCII..., Excel..., Access..., ODBC..., Geodatabase..., and Feature Class or Table in MXD... Another red arrow points from the 'Import Location Data' option to a sub-menu that lists: Import Location Data, Import Assay Data, Import acquire Data..., Import DrillHole Data..., Edit Survey Attributes..., Survey Coordinate System..., Edit Assay Batch Attributes, Assay Field Attributes, and Survey Coordinate System... The background shows a Microsoft Excel spreadsheet with columns for Line, Agppm, Asppm, Auppb, Cupppm, Hgppb, Moppm, Pbppm, Sample, Sbppm, X, Y, Zppm, Type, Duplicate, and Standard. The spreadsheet contains data for various samples, including L1000, L1001, L1001, L1460, and L14100.

Line	Agppm	Asppm	Auppb	Cupppm	Hgppb	Moppm	Pbppm	Sample	Sbppm	X	Y	Zppm	Type	Duplicate	Standard
1	L1000	0.2	20	24	90	21	1	7 7427	8	5 26390	8161361	124	SOIL	7426	
2	L1001	0.1	14	28	82	12	2	5 7431	5	5 26378	8161345	112	SOIL	7430	
3	L1001	0.1	14	28	82	12	2	5 7431	5	5 26378	8161345	112	SOIL	7430	
4	L1460	0.1	33	10	95	15	2	5 7501	10	5 26753	8161078	130	X2	7500	
5	L14100	0.1	68	1	89	45	1	57 8278	6	5 28906.2	8199947	17	SOIL	8275	

• **Controle de Qualidade de amostras:**

- Duplicatas
- Padrões

[Sample]: 00-FH-5010
 [Assay]: Cu, [Value]: 44
 [Sample]: 00-FH-5070
 [Assay]: Cu, [Value]: 44
 [Sample]: 00-FH-5130
 [Assay]: Cu, [Value]: 43



- Ferramentas avançadas de Estatística e Análises:
 - Análise de um único elemento ou Multielementar
 - Plots Interativos entre dados e mapas

The screenshot displays several ArcGIS analysis windows:

- Probability Analysis (Cuppm):** Shows statistical data for the 'Cuppm' assay field.

Assay field:	Cuppm
Total Samples:	580
Null values:	0
Minimum:	2.00
Maximum:	2520.00
Range:	2518.00
Mean:	117.58
Standard deviation:	119.05
Items > 0:	580
Sum:	68197.00
Geometric mean:	98.88
Median:	102.50
Mode:	104.00
Frequency:	16225033.00
Mean:	14173.33
Standard deviation:	14.77
Median:	285.74
- Cuppm Probability Plot:** A log-log plot showing the cumulative distribution of Cuppm values. The y-axis is labeled 'Value' on a log scale from 10 to 1000. The x-axis is labeled 'Cumulative Probability' from 0 to 1.0. The data points are colored in a gradient from black to purple.
- Pbpmm Histogram:** A histogram showing the frequency distribution of Pbpmm values. The x-axis is labeled 'Pbpmm' from 4.00 to 500.00. The y-axis is labeled 'Count' from 0 to 50. A cumulative distribution curve is overlaid in red.
- Multi-Probability Analysis:** A summary window for the 'Fort Hope' project, listing the scientist as 'Janaina' and the project date as '2012/06/01'. It contains six small probability plots for different elements: Ag, Cu, Pb, Zn, Ni, and Cr.
- Other Plots:** Two smaller plots are visible at the bottom: 'Cuppm-Cuppm Scatter Plot' and 'Asppm-Asppm Ternary Plot'.

- **Sumário de Estatísticas**

Summary Statistics Selection

Dataset: Assay-QA-QC

Assay field: Agppm

Selection: All
 Selected

Next Cancel

Summary Statistics

Assay field: Agppm

Total Samples: 580

Null values: 0

Minimum: 0.10

Maximum: 21.40

Range: 21.30

Mean: 0.20

Standard deviation: 0.93

Displayed decimal places: 2

Less Back OK Cancel

Items > 0: 580

Sum: 118.35

Geometric mean: 0.13

Median: 0.10

Mode: 0.10

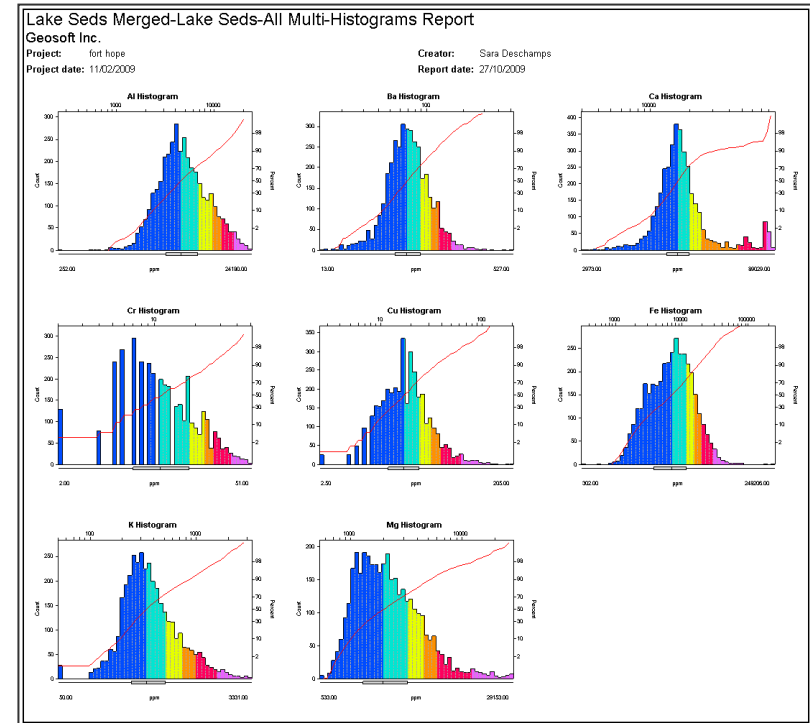
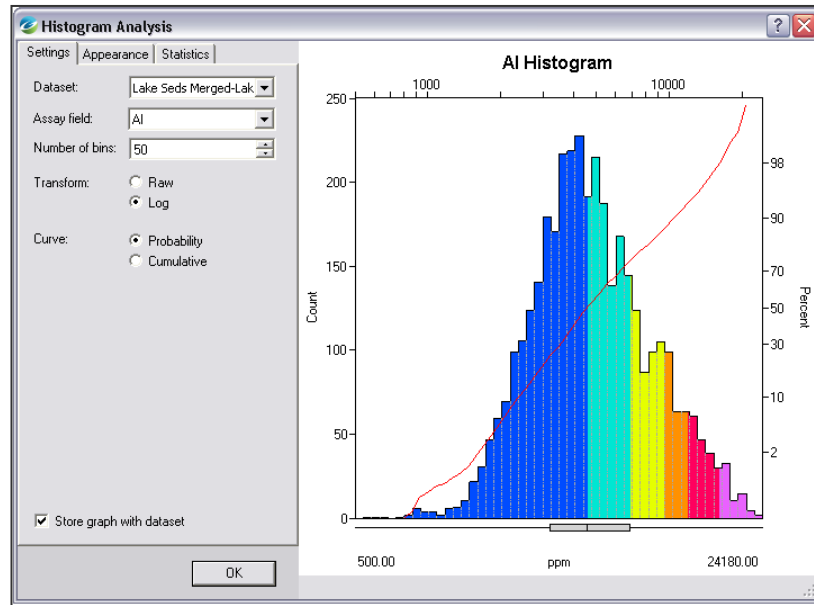
Sum of squares: 529.28

Variance: 0.87

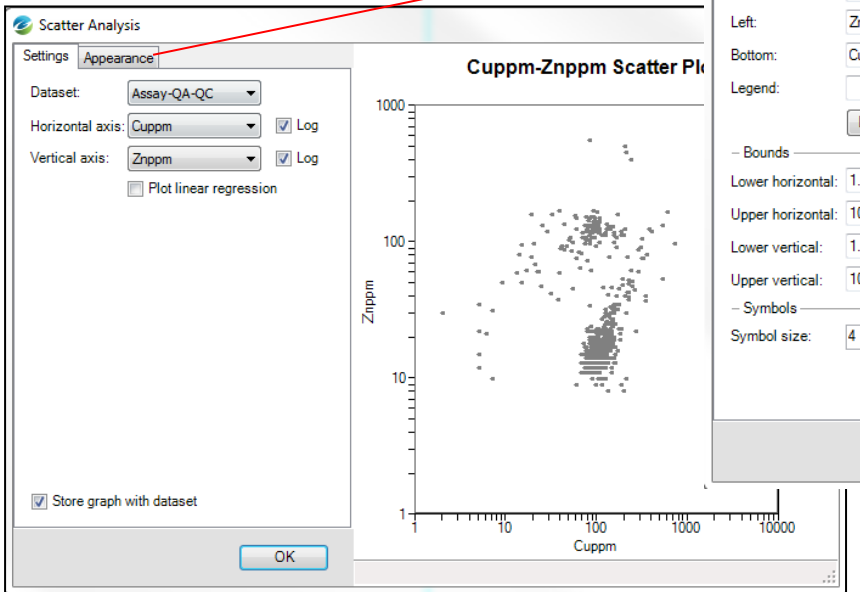
Skewness: 20.59

Kurtosis: 456.98

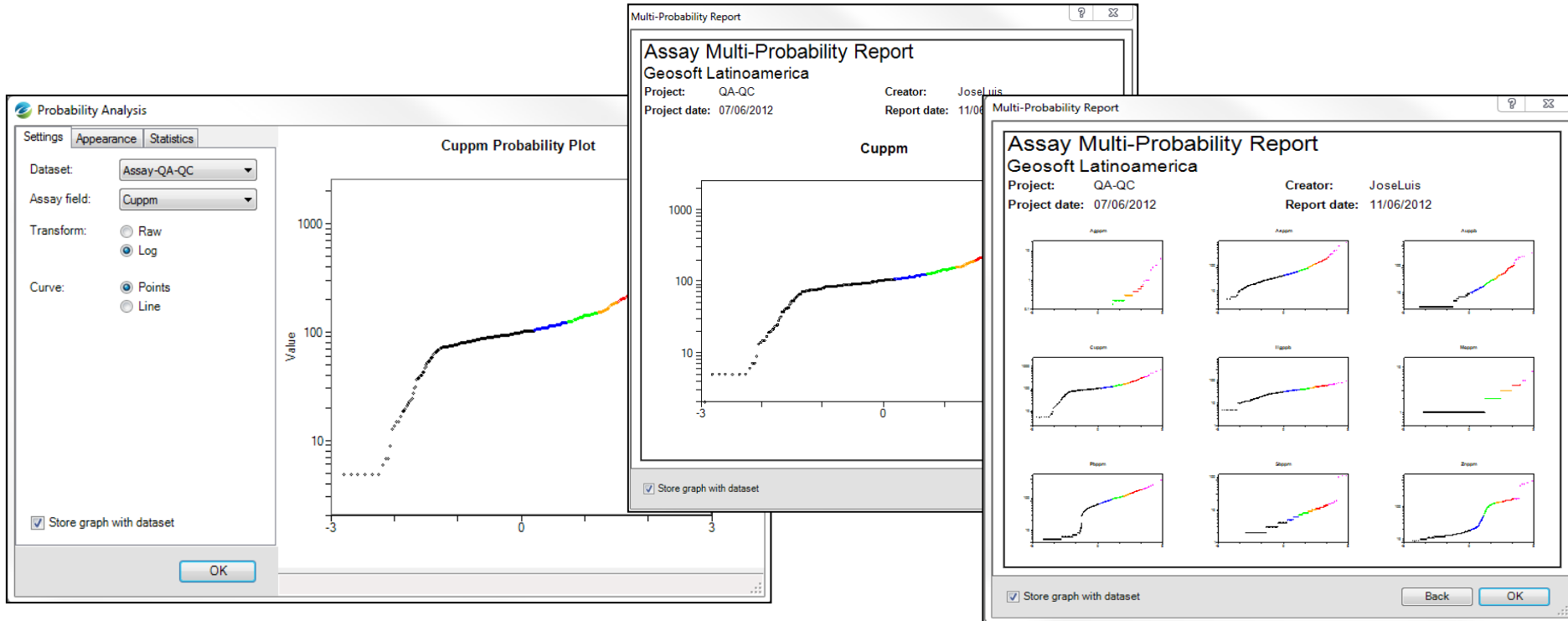
- Histogramas e plot de multi-histogramas**



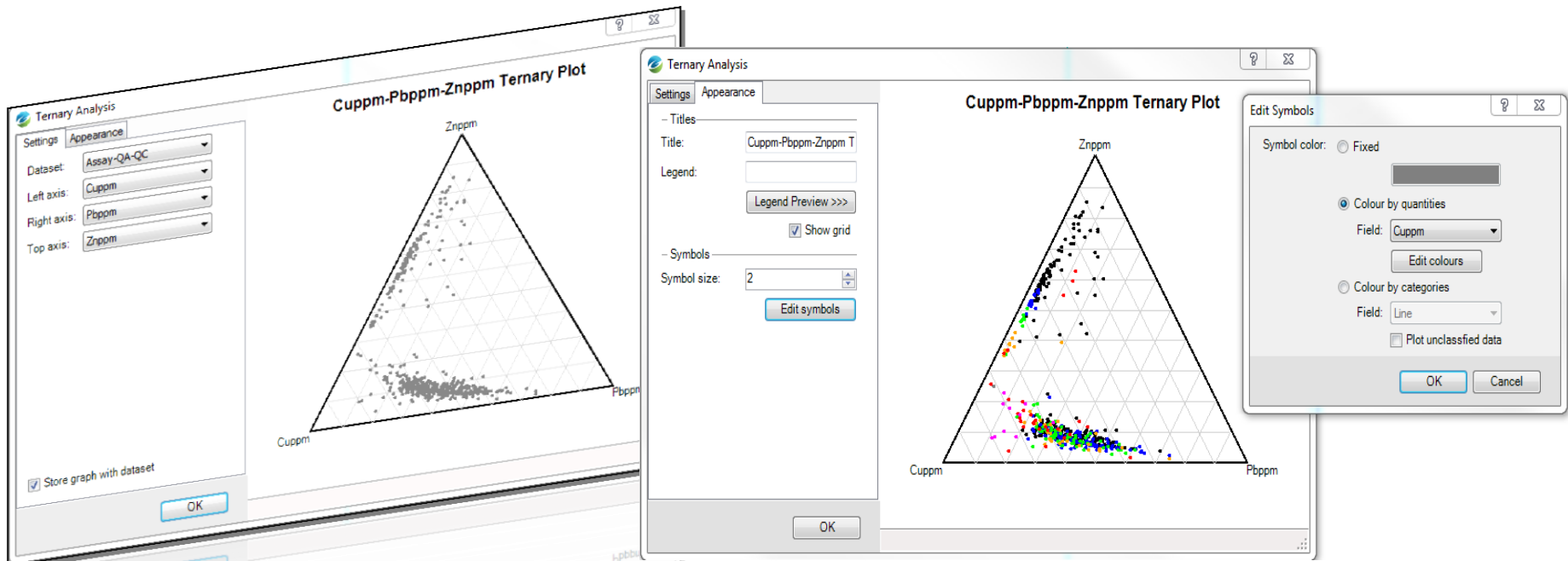
- **Análise de Dispersão**



- Probabilidade e plot de multi-probabilidades

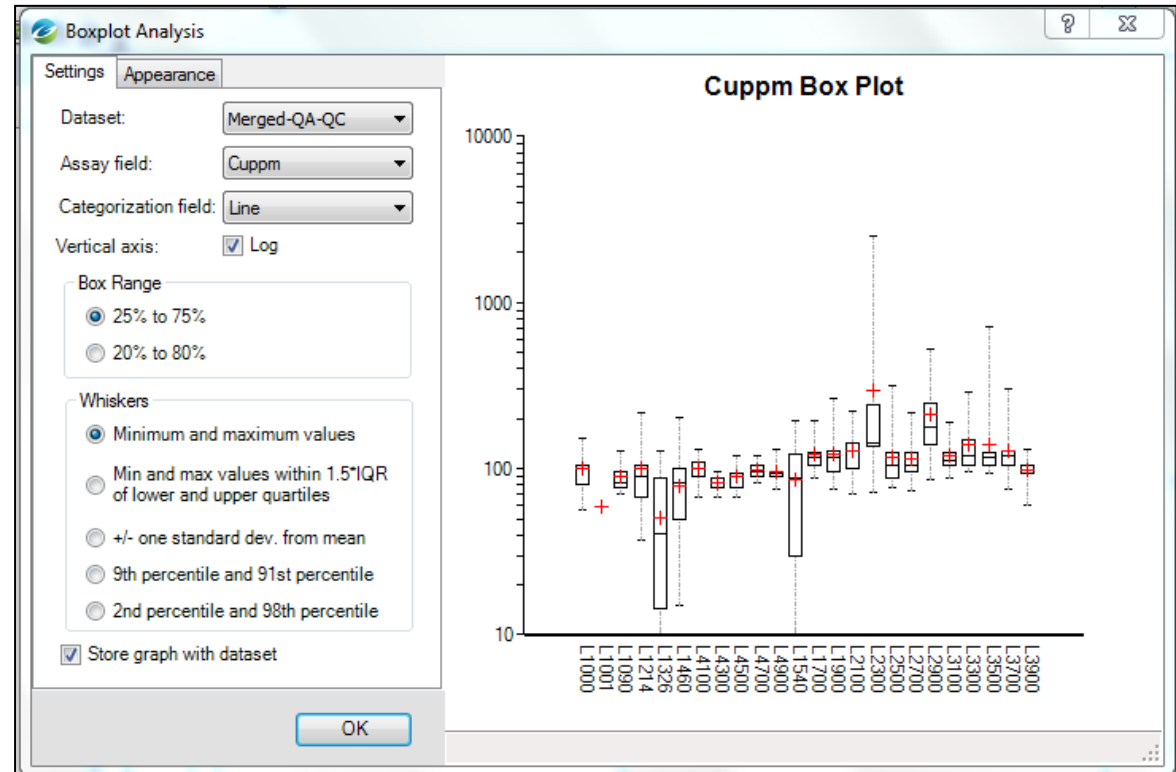


- **Análise Ternária - Triplot**

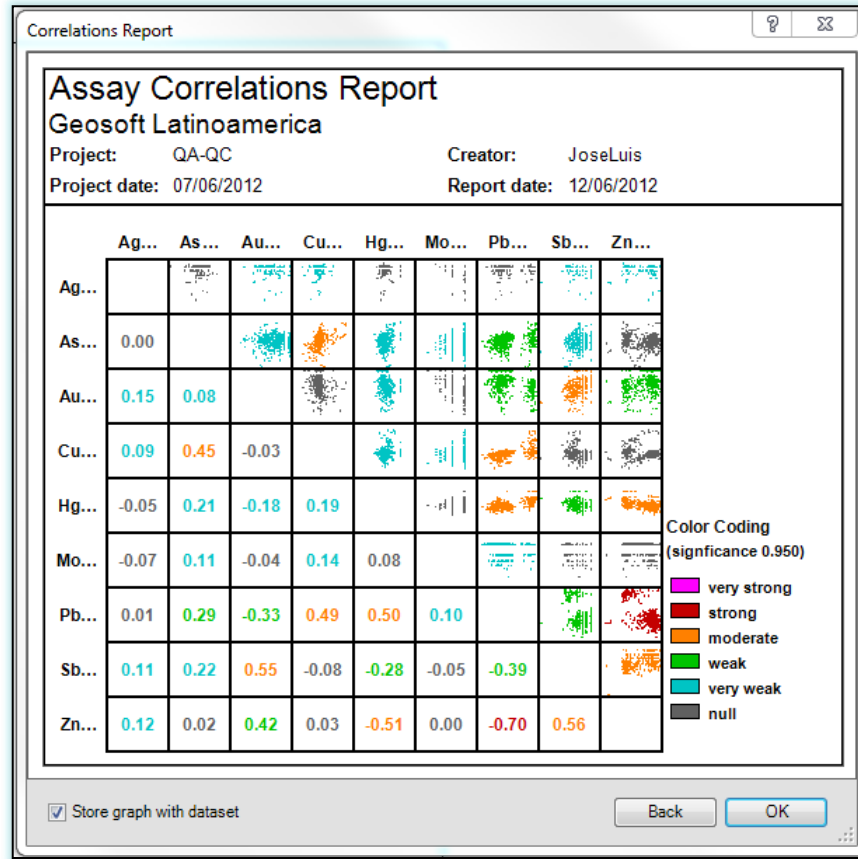


- Boxplot**

Mostra a distribuição dos elementos por categorias.

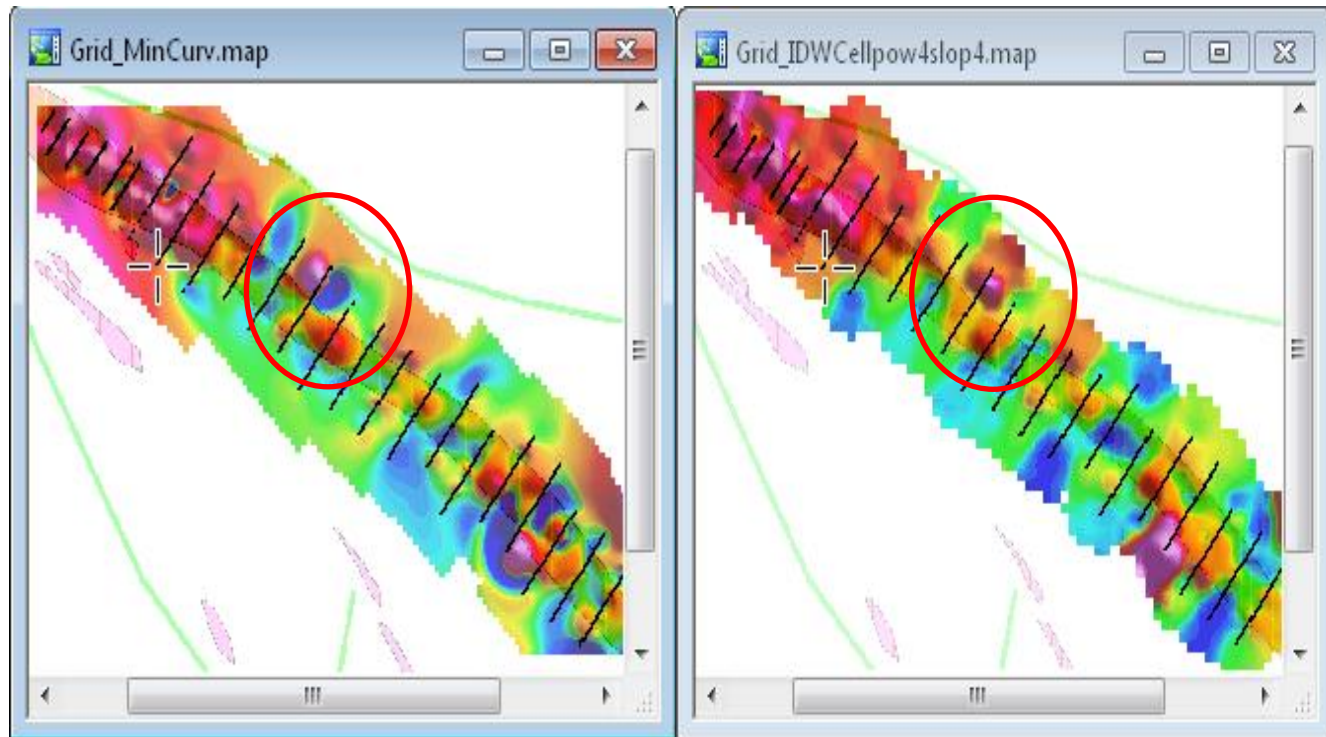


- Relatórios de Correlação



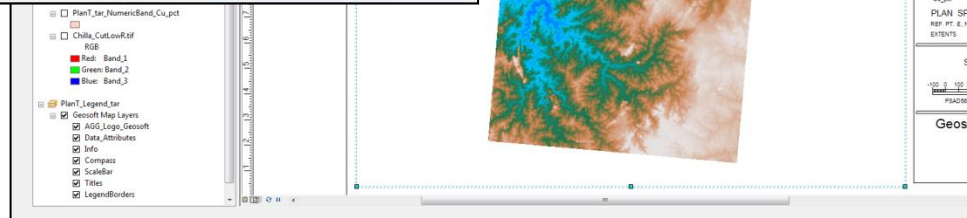
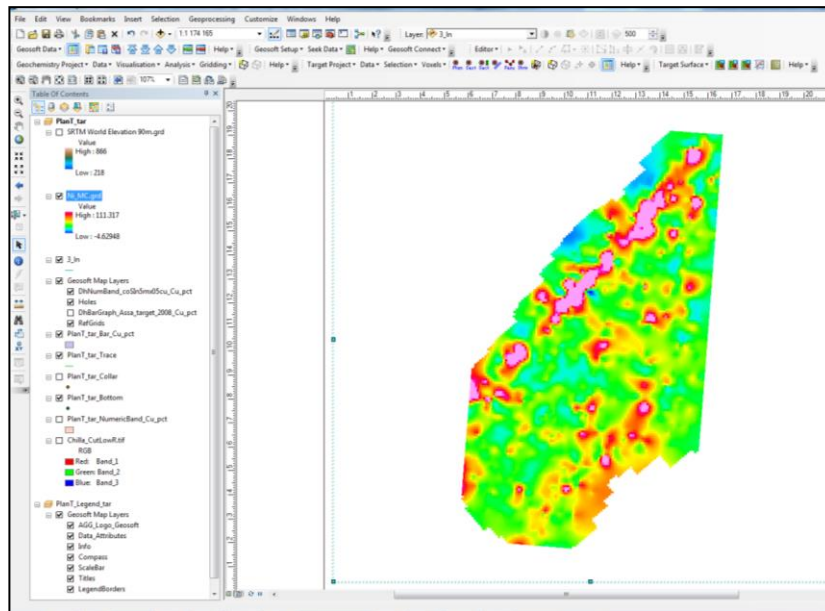
- **Algoritmos de interpolação**
 - Kriging Direcional
 - Mínima Curvatura
 - Inverso da Distância Ponderada

- **Isolinhas ou isoteores**

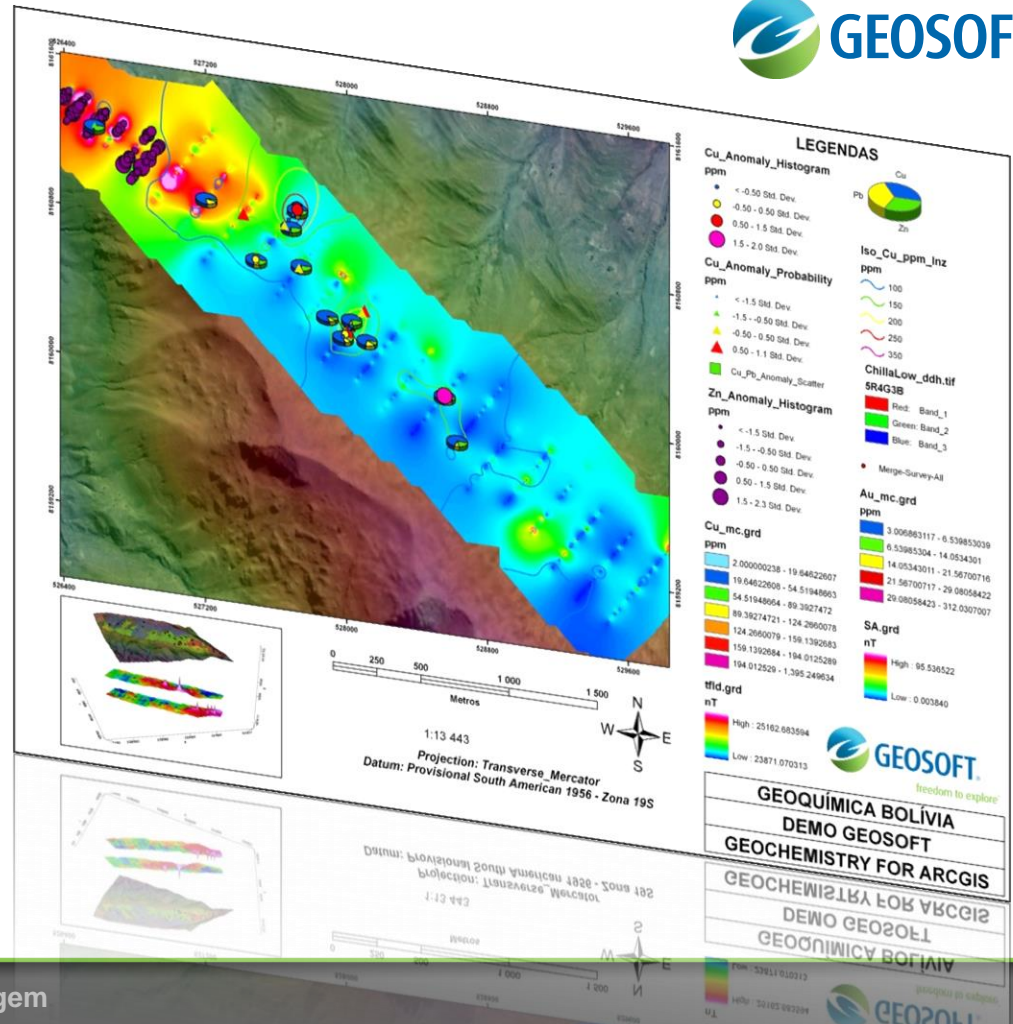


É possível gerar **Modelo Digital de Elevação** a partir de

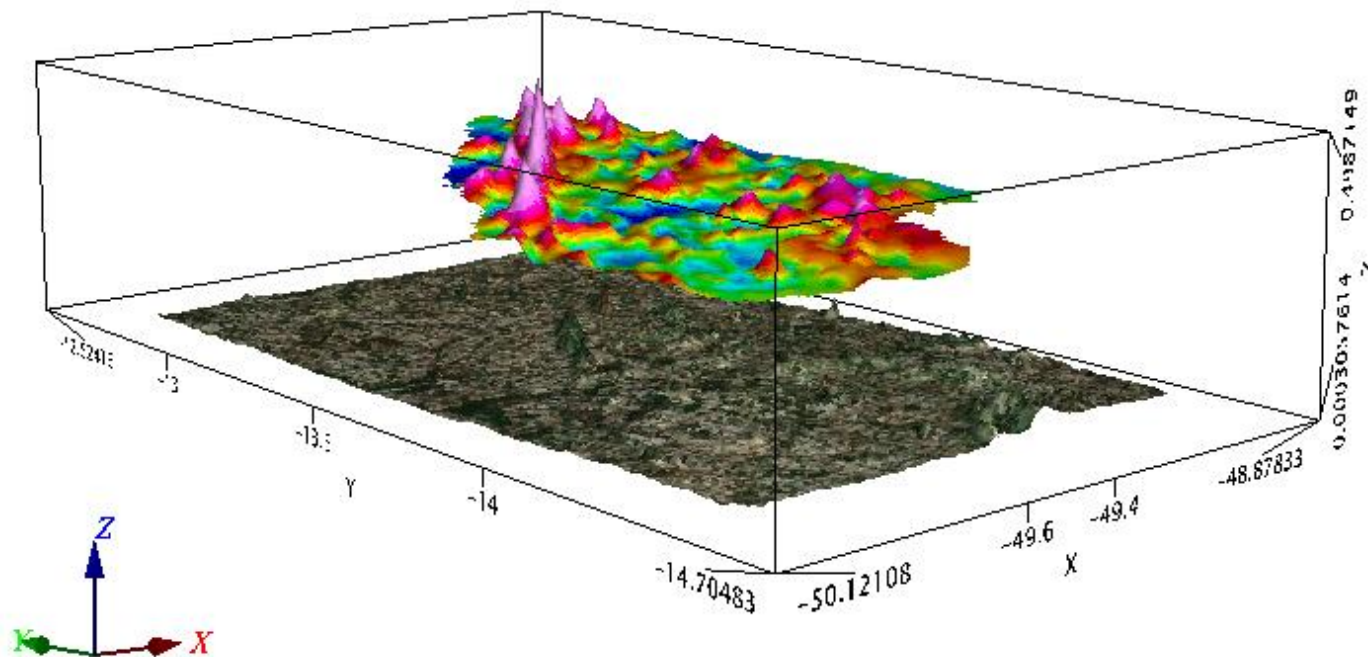
- shapes
- formatos autocad (DXF, DWG)
- Arquivos de pontos



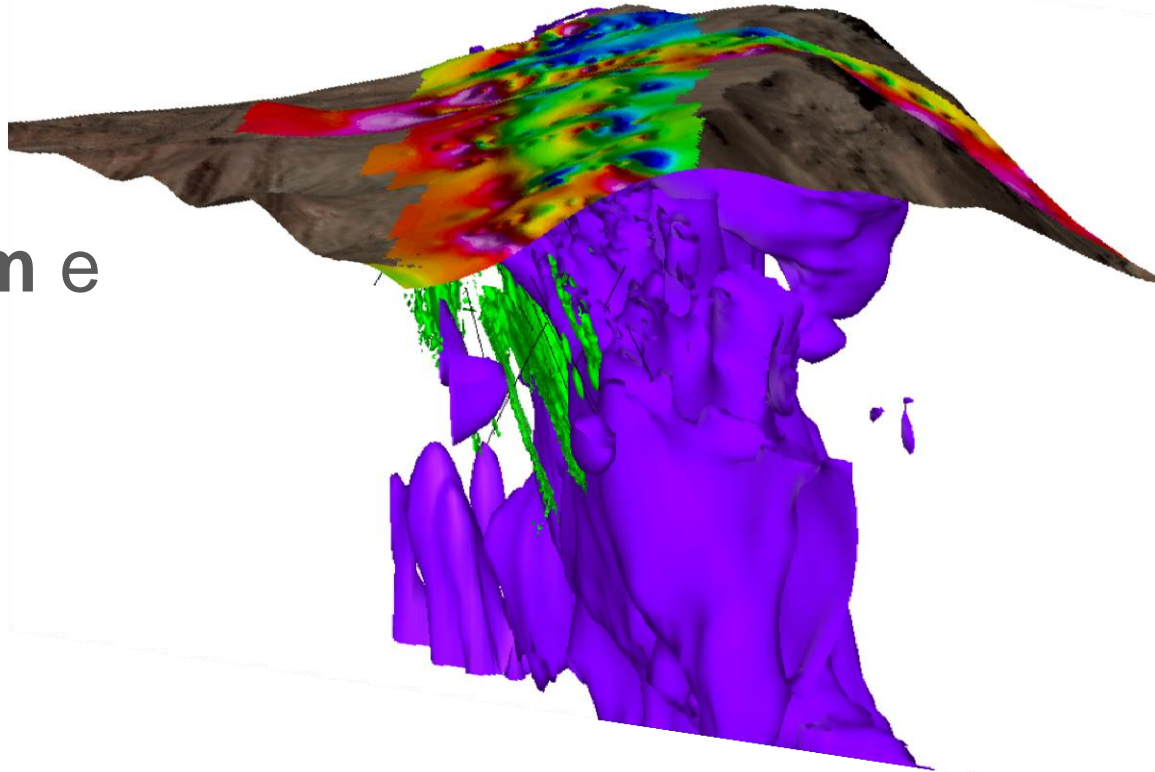
- Ferramentas avançadas de plot em mapas 2D
- Construção completa de mapas para análise e interpretação



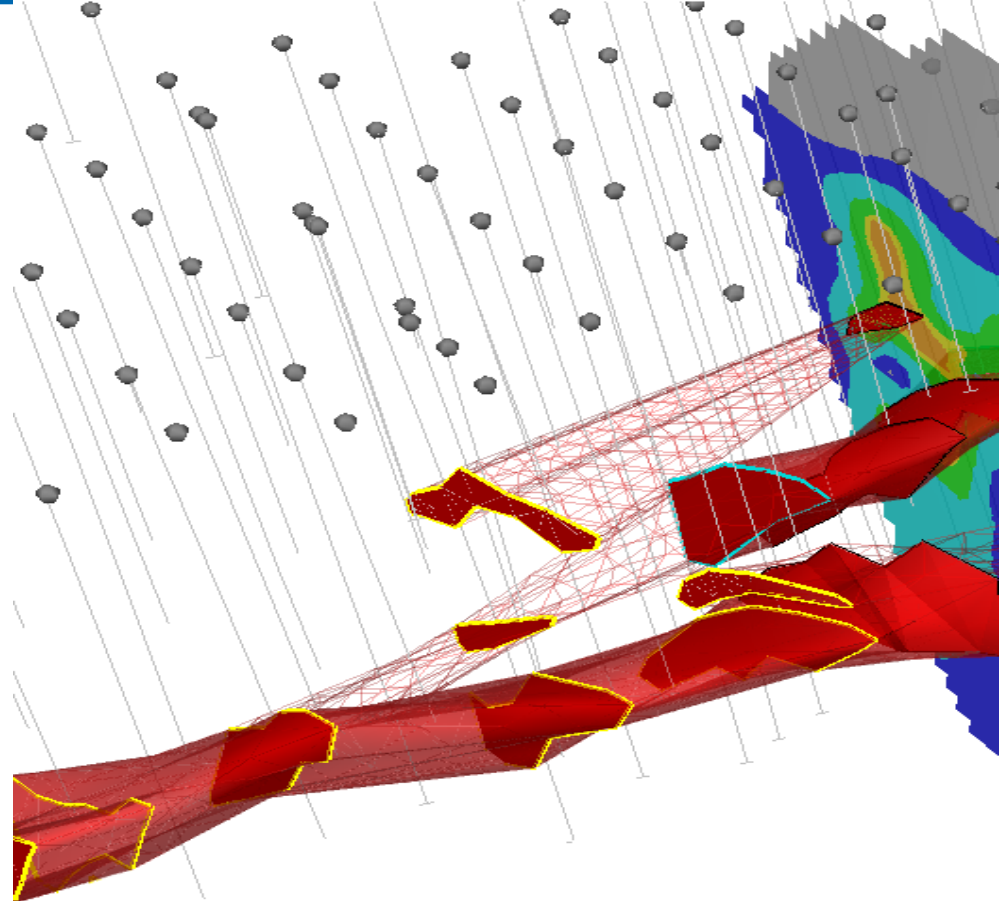
- Mapa 3D



É possível integrar
dados de Sondagem e
Geofísica



Além de realizar
modelagem 3D de
corpos e planos
com a ferramenta



Obrigado pela atenção!
Visite www.geosoft.com para mais informações.



Info.sa@geosoft.com