



Utilizando ArcGIS para Geoquímica de superfície e sondagem

Geochemistry for ArcGIS

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Agenda

- 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



O que é Geoquímica?

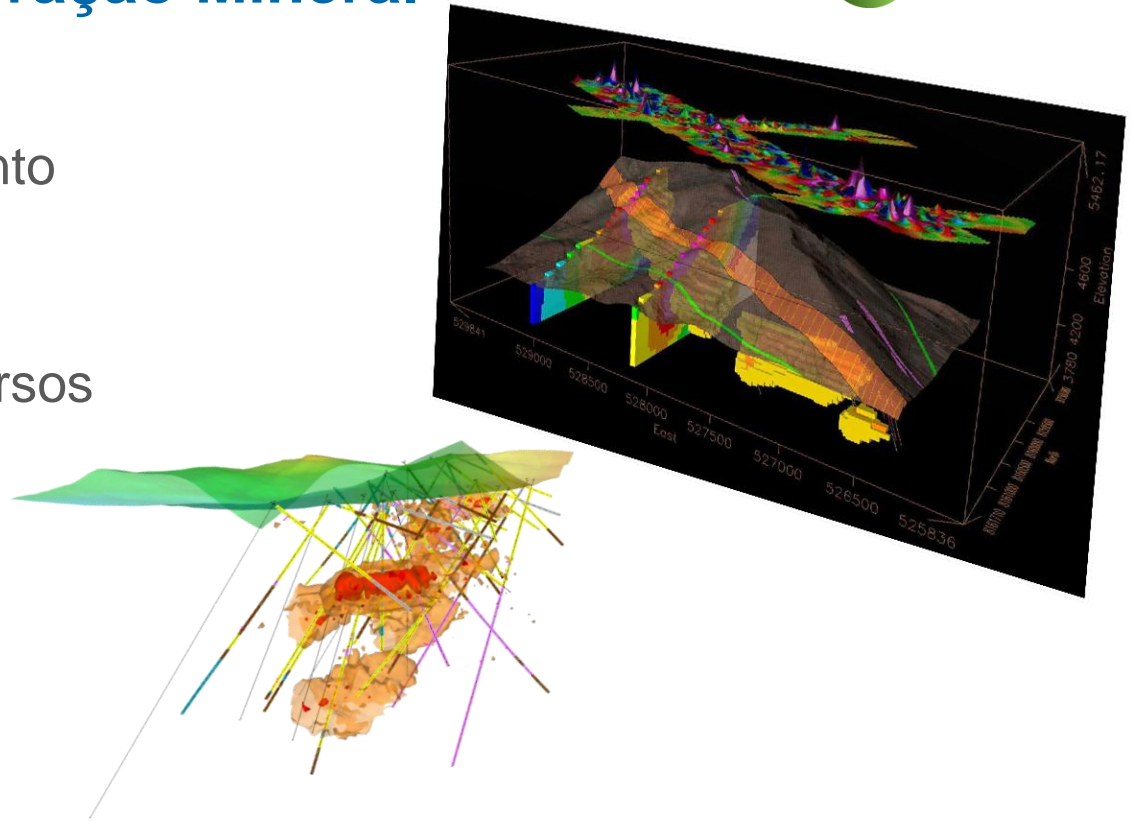


É o ramo da ciência geológica que estuda a química do planeta.

A geoquímica utiliza as leis da química para entender os processos que governam a abundância e distribuição dos elementos nas diversas partes da Terra e nos corpos celestes (cosmoquímica), assim como nos diversos materiais que compõem o interior e a superfície da Terra: magmas, rochas, minerais, minérios, água, ar, etc

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

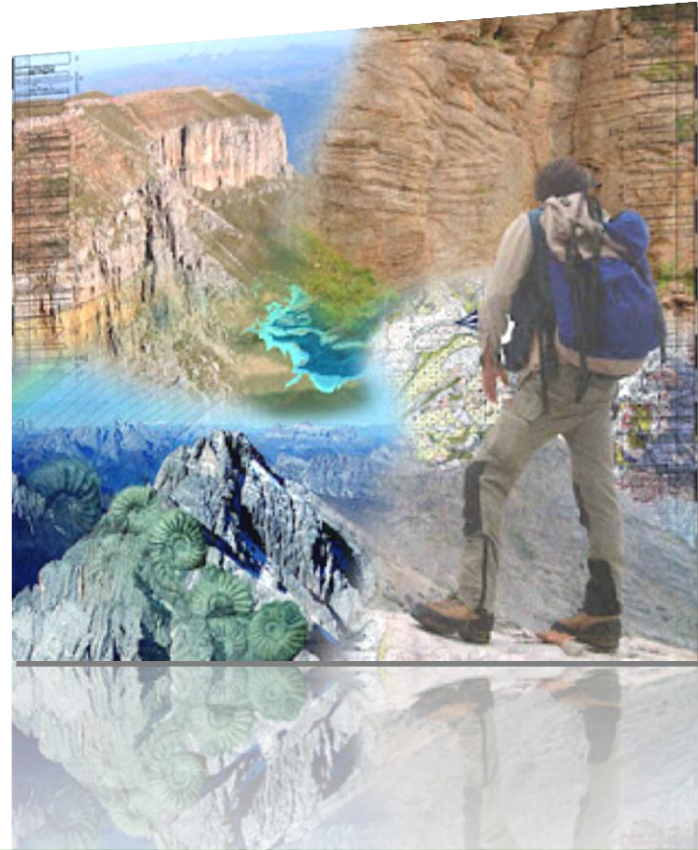
- Avanço no conhecimento científico
- Procura de novos recursos
- Dados Integrados
- Grau de confiabilidade



Primeira Enquete



- Pesquisa Mineral
 - Prospecção
 - Exploração
 - Desenvolvimento



Geoquímica como ferramenta para exploração

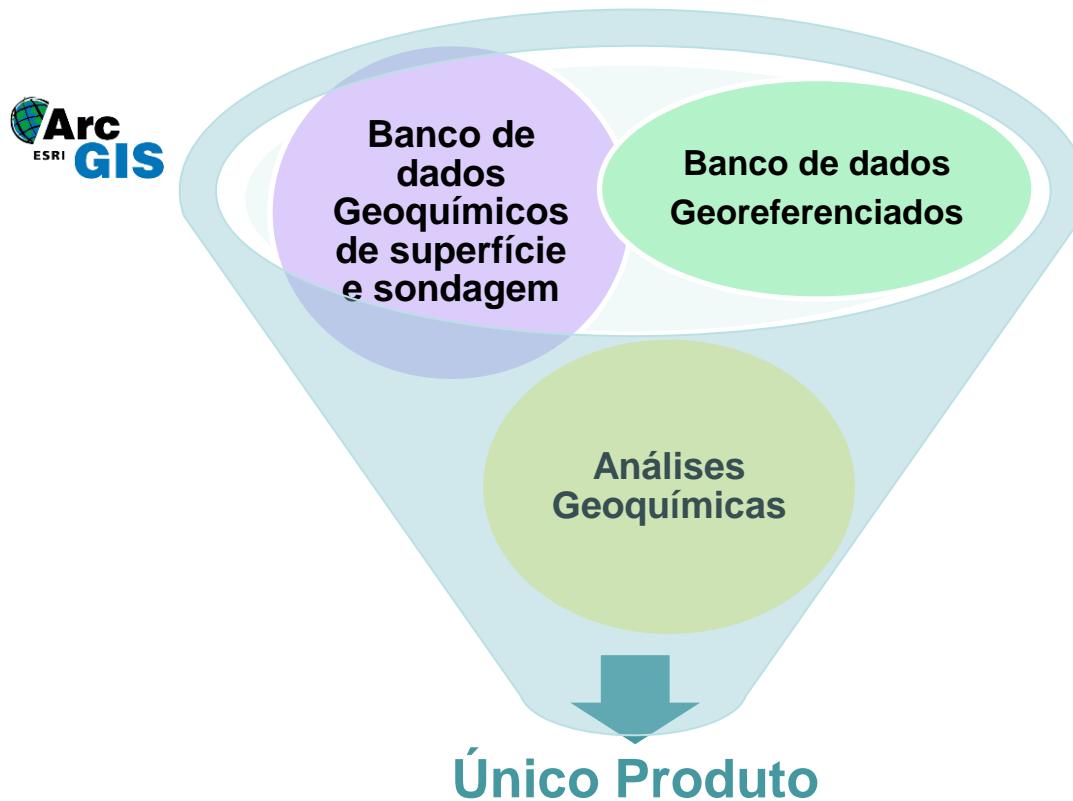


Segunda Enquete

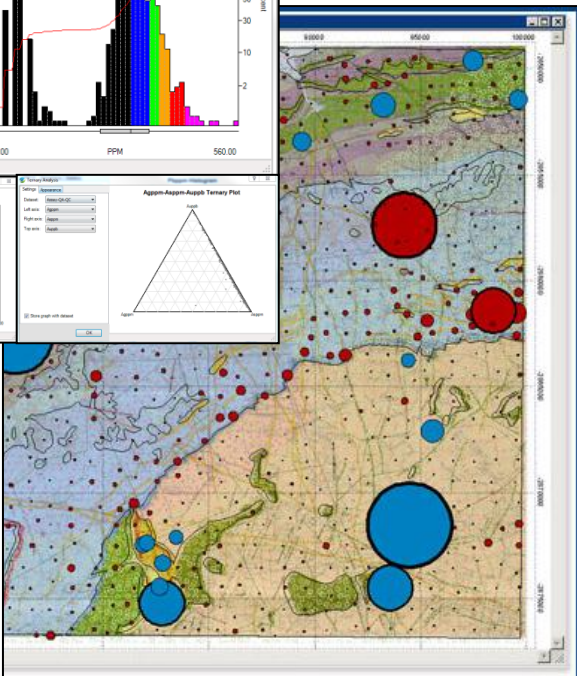
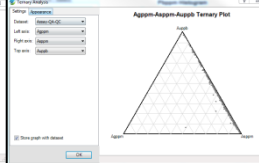
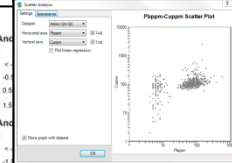
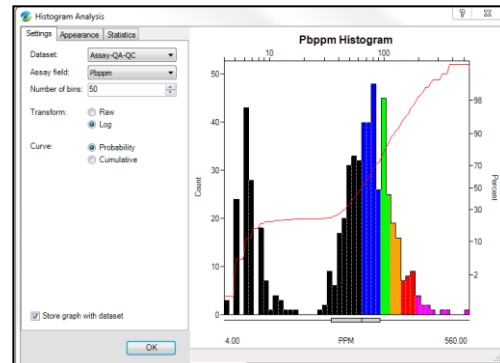
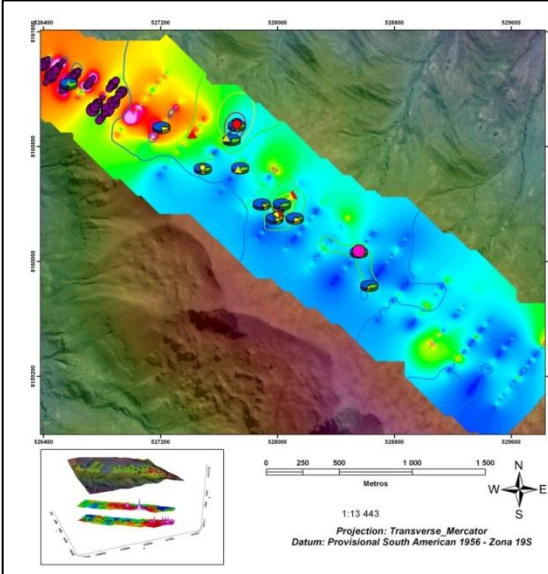



Trabalhando com dados Geoquímicos no ArcGIS



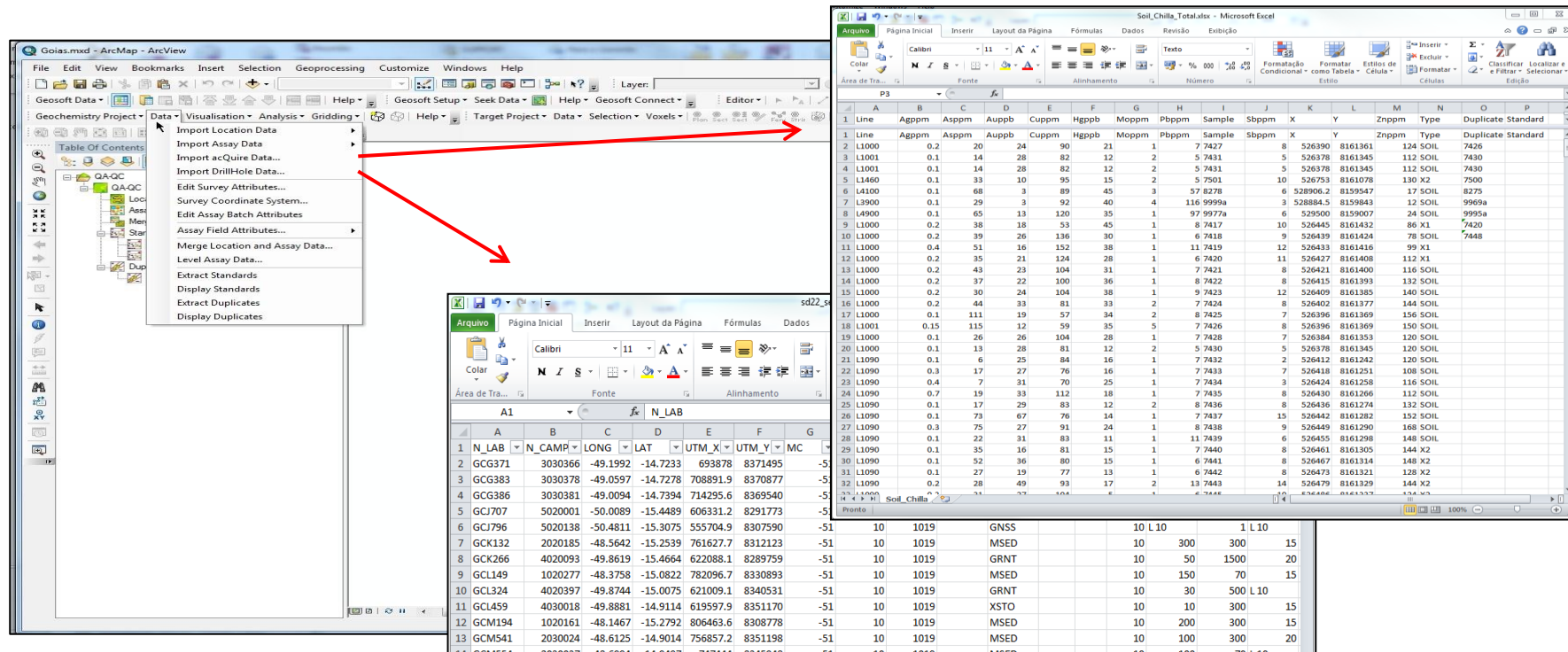


➤ Desenvolvido para visualização e análise estatística de dados geoquímicos

GEOQUÍMICA BOLÍVIA
DEMO GEOSOFT
GEOCHEMISTRY FOR ARCGIS

- Importação de dados de superfície e de sondagem



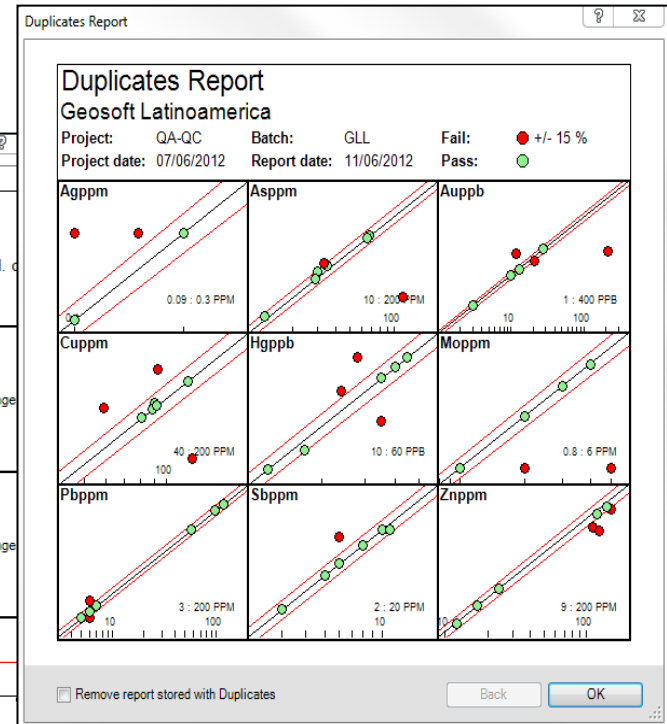
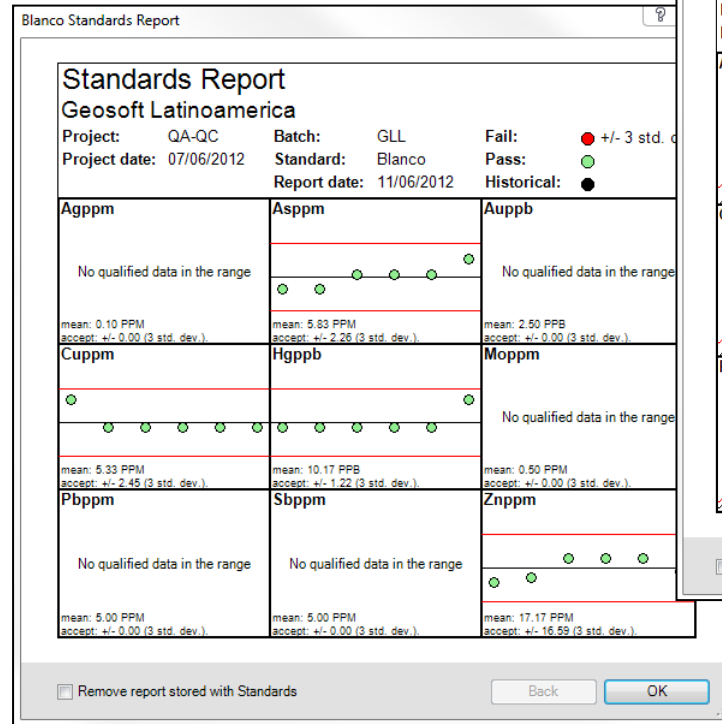
The image shows a workflow for importing geochemical data into ArcGIS. On the left, the ArcMap interface displays the 'Geochemistry Project' menu with 'Data' selected. A red arrow points from the 'Data' menu to the 'Import Location Data' option in the 'Soil_Chilla_Totals.xlsx' Excel spreadsheet. Another red arrow points from the 'Import Assay Data' option to the 'N_LAB' column in the spreadsheet. The spreadsheet contains two tables of data.

Line	Agppm	Asppm	Au	Cu	Pb	Mn	Bi	Sample	Sb	X	Y	Zn	Type	Duplicate	Standard
1															
2	1.0000	0.2	20	24	90	21	1	7.2427	8	526390	8161361	124	SOIL	7426	
3	1.0001	0.1	14	28	82	12	2	5.7431	5	526378	8161345	112	SOIL	7430	
4	1.0001	0.1	14	28	82	12	2	5.7431	5	526378	8161345	112	SOIL	7430	
5	1.1460	0.1	33	10	95	15	2	5.7501	10	526753	8161078	130	X2	7500	
6	1.4100	0.1	68	3	89	45	3	57.8278	6	528906.2	8159547	17	SOIL	8275	
7	1.3900	0.1	29	3	92	40	4	116.9999a	3	528884.5	8159843	12	SOIL	9969a	
8	1.4900	0.1	65	13	120	35	1	97.9977a	6	529500	8159007	24	SOIL	9955a	
9	1.0000	0.2	38	18	53	45	1	8.7417	10	526445	8161432	86	X1	7420	
10	1.0000	0.2	39	26	136	30	1	6.7418	9	526439	8161424	78	SOIL	7448	
11	1.0000	0.4	51	16	152	38	1	11.7419	12	526433	8161216	99	X1		
12	1.0000	0.2	35	21	124	28	1	6.7420	11	526427	8161408	112	X1		
13	1.0000	0.2	43	23	104	31	1	7.7421	8	526421	8161400	116	SOIL		
14	1.0000	0.2	37	22	100	36	1	8.7422	8	526415	8161393	132	SOIL		
15	1.0000	0.2	30	24	104	38	1	9.7423	12	526409	8161385	140	SOIL		
16	1.0000	0.2	44	33	81	33	2	7.7424	8	526402	8161377	144	SOIL		
17	1.0000	0.1	111	19	57	34	2	8.7425	7	526396	8161369	156	SOIL		
18	1.0001	0.15	115	12	59	35	5	7.7426	8	526396	8161369	156	SOIL		
19	1.0000	0.1	26	26	104	28	1	7.7428	7	526384	8161353	120	SOIL		
20	1.0000	0.1	13	28	81	12	2	5.7430	5	526378	8161345	120	SOIL		
21	1.0090	0.1	6	25	84	16	1	7.7432	2	526412	8161242	120	SOIL		
22	1.0090	0.3	17	27	76	16	1	7.7433	7	526418	8161251	108	SOIL		
23	1.0090	0.4	7	31	70	25	1	7.7434	3	526424	8161258	116	SOIL		
24	1.0090	0.7	19	33	112	18	1	7.7435	8	526430	8161266	112	SOIL		
25	1.0090	0.1	17	29	83	12	2	8.7436	8	526436	8161274	132	SOIL		
26	1.0090	0.1	73	67	76	14	1	7.7437	8	526442	8161282	132	SOIL		
27	1.0090	0.3	75	27	91	24	1	8.7438	9	526449	8161290	168	SOIL		
28	1.0090	0.1	22	31	83	11	1	11.7439	6	526455	8161298	148	SOIL		
29	1.0090	0.1	35	16	81	15	1	7.7440	8	526461	8161305	144	X2		
30	1.0090	0.1	52	36	80	15	1	6.7441	8	526467	8161314	148	X2		
31	1.0090	0.1	27	19	77	13	1	6.7442	8	526473	8161321	128	X2		
32	1.0090	0.2	28	49	93	17	2	13.7443	14	526479	8161329	144	X2		
33	1.0090	0.1	21	37	104	6	1	6.7444	8	526485	8161337	134	X2		

N_LAB	N_CAMP	LONG	LAT	UTM_X	UTM_Y	MC
1	GCG371	3030366	-49.1992	-14.7233	693878	8371495
3	GCG383	3030378	-49.0597	-14.7278	708891.9	8370877
4	GCG386	3030381	-49.0094	-14.7394	714295.6	8369540
5	GCI707	5020001	-50.0089	-15.4489	606331.2	8291773
6	GCI796	5020138	-50.4811	-15.3075	555704.9	8307590
7	GCK132	2020185	-48.5642	-15.2539	761627.7	8312123
8	GCK266	4020093	-49.8619	-15.4664	622088.1	8289759
9	GCL149	1020277	-48.3758	-15.0822	782096.7	8330893
10	GCL324	4020397	-49.8744	-15.0075	621009.1	8340531
11	GCL459	4030018	-49.8881	-14.9114	619597.9	8351170
12	GCM194	1020161	-48.1467	-15.2792	806463.6	8308778
13	GCM541	2030024	-48.6125	-14.9014	756857.2	8351198

- **Controle de Qualidade de amostras:**

- Duplicatas
- Padrões



- Ferramentas avançadas de Estatística e Análises:
 - Análise Multielementar
 - Plots Interativos entre dados e mapas

The screenshot displays several ArcGIS tool windows:

- Probability Analysis:** 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
Sum of squares:	16225033.00
Standard error:	14173.33
Standard error of mean:	14.77
Standard error of median:	285.74
- Cuppm Probability Plot:** A log-log plot showing the cumulative distribution of Cuppm values. The y-axis is labeled 'Value' and ranges from 10 to 1000. The x-axis is labeled 'Cumulative Probability' and ranges from 0 to 1.0. The data points are colored in a gradient from black to purple.
- Pbppm Histogram:** A histogram showing the frequency distribution of Pb values. The x-axis is labeled 'Pbpm' and ranges from 4.00 to 500.00. The y-axis is labeled 'Count' and ranges from 0 to 50. A cumulative distribution curve is overlaid on the histogram.
- Multi-Probability Analysis PH Engenharia:** A summary window for a project titled 'Fort Hope' by Scientist 'Janaina', dated 2012/06/01. It contains six small probability plots for different elements: Ag, Cu, Pb, Zn, Ni, and Cr.

- **Sumário de Estatísticas**

Summary Statistics Selection [?] [X]

Dataset: Assay-QA-QC

Assay field: Agppm

Selection: All
 Selected

Next Cancel

Summary Statistics [?] [X]

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

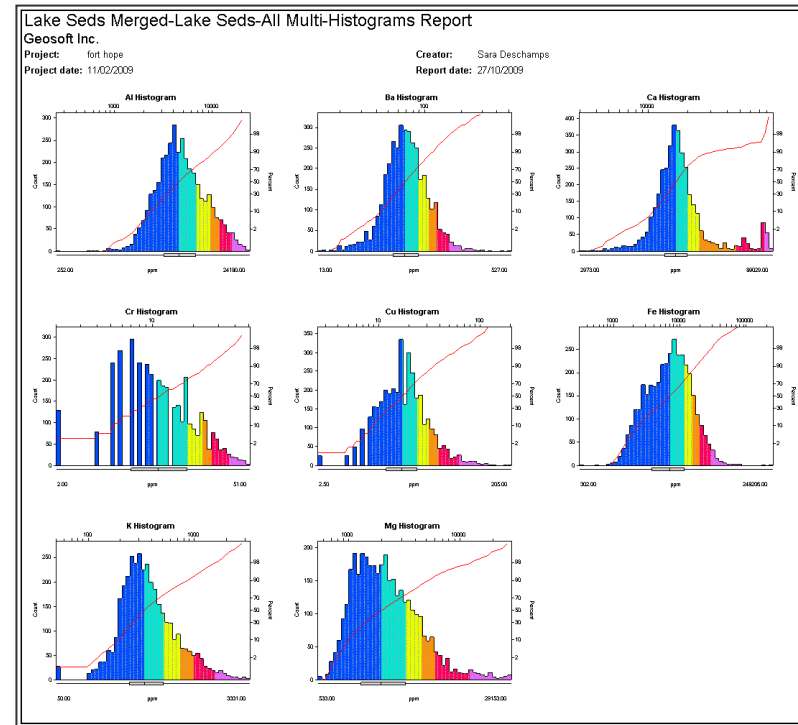
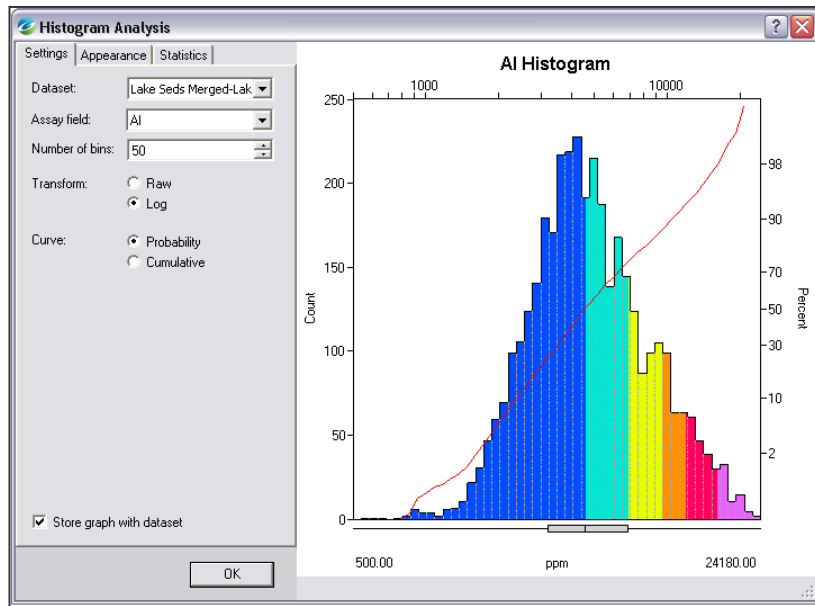
Sum of squares: 529.28

Variance: 0.87

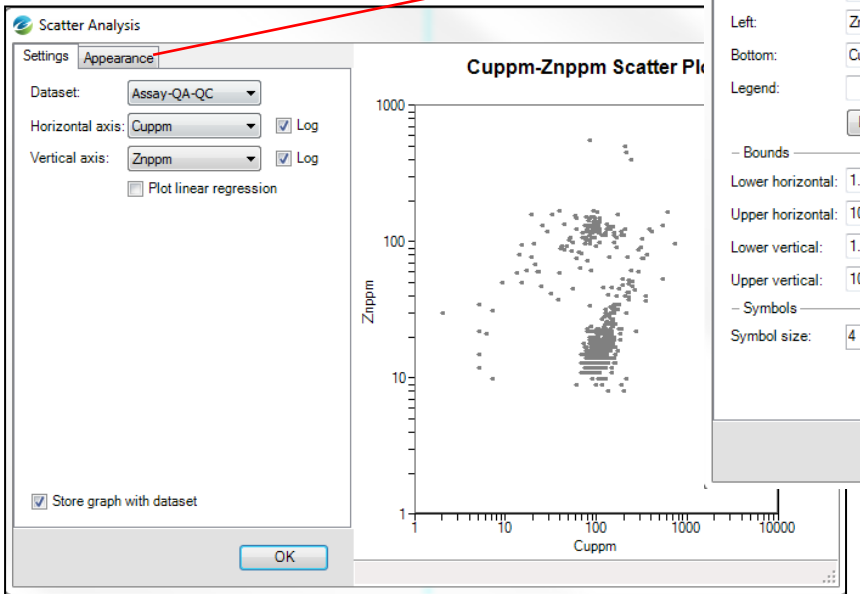
Skewness: 20.59

Kurtosis: 456.98

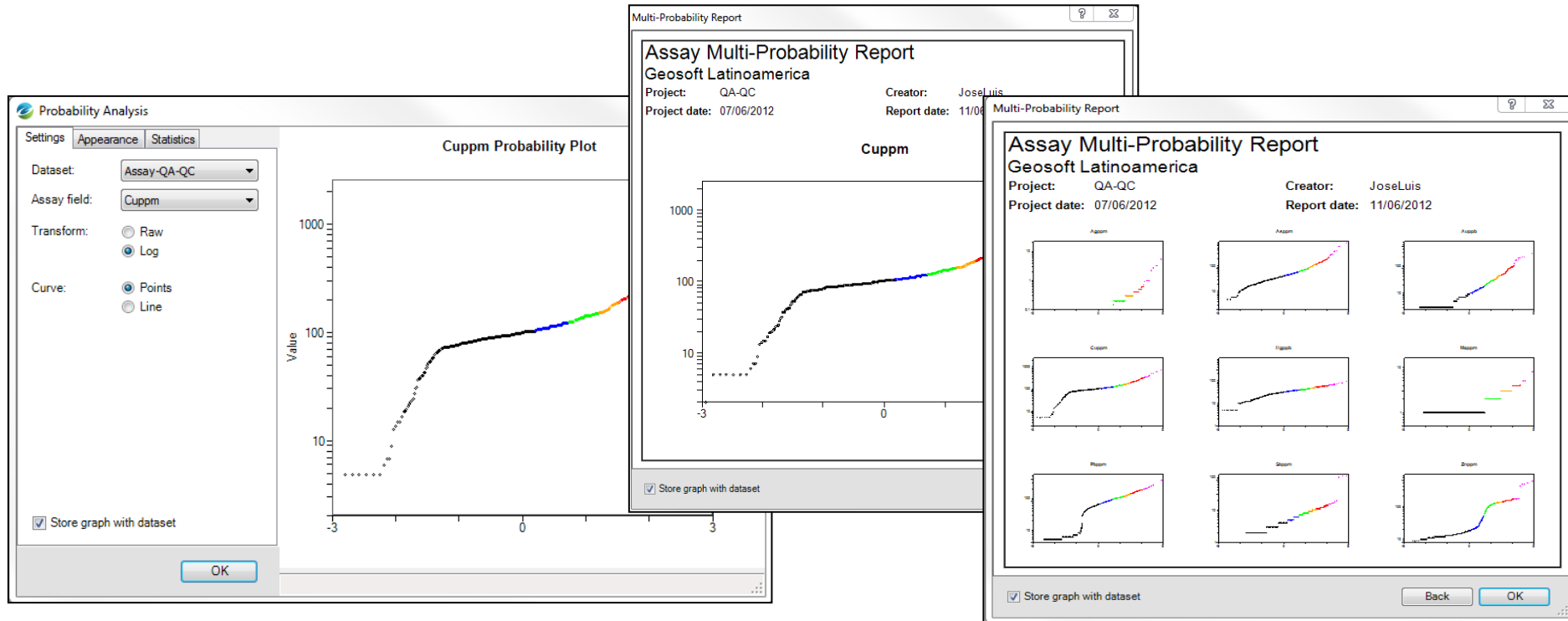
- Histogramas e plot de multi-histogramas**



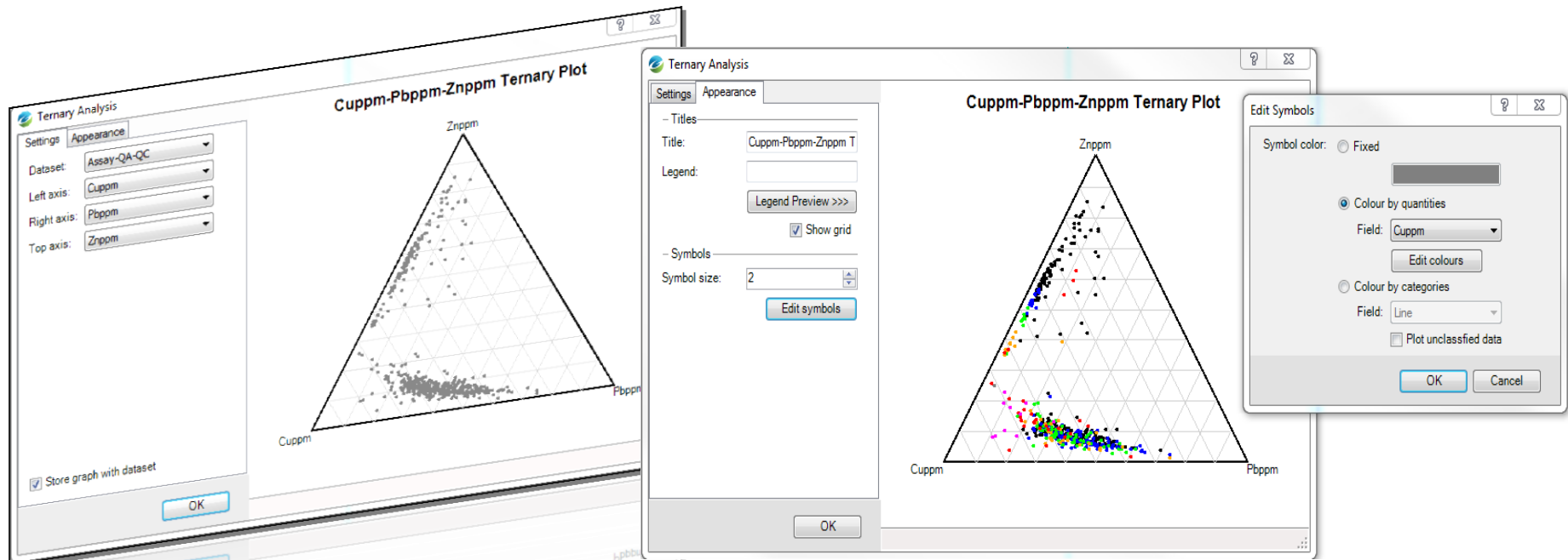
- **Análise de Dispersão**



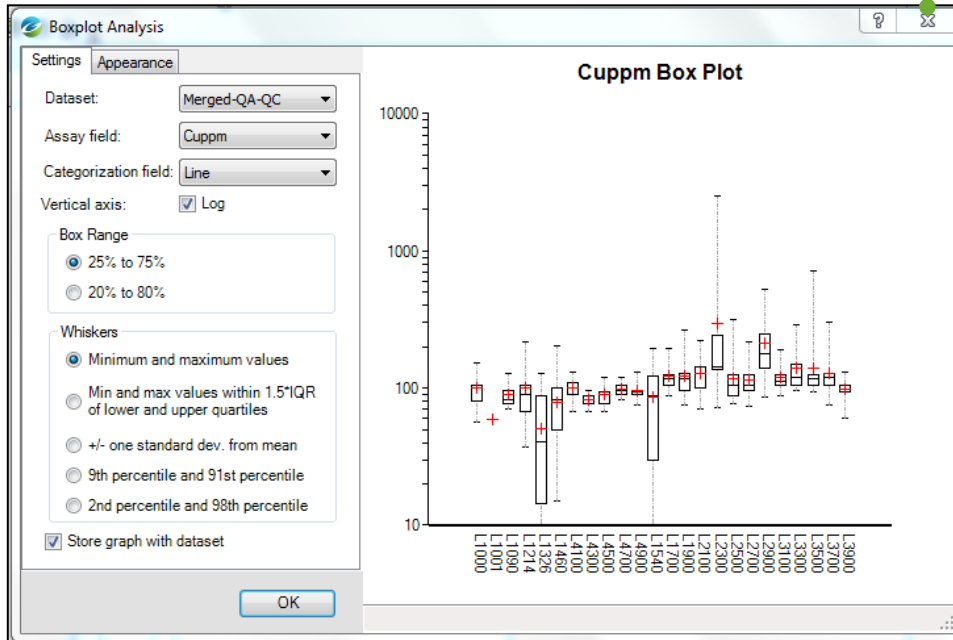
- Probabilidade e plot de multi-probabilidades



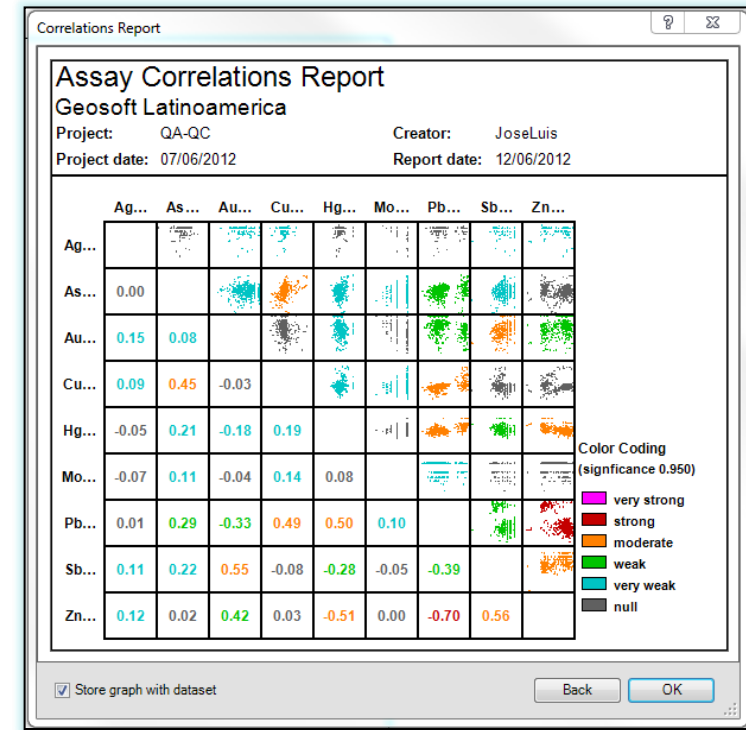
- **Análise Ternária - Triplot**



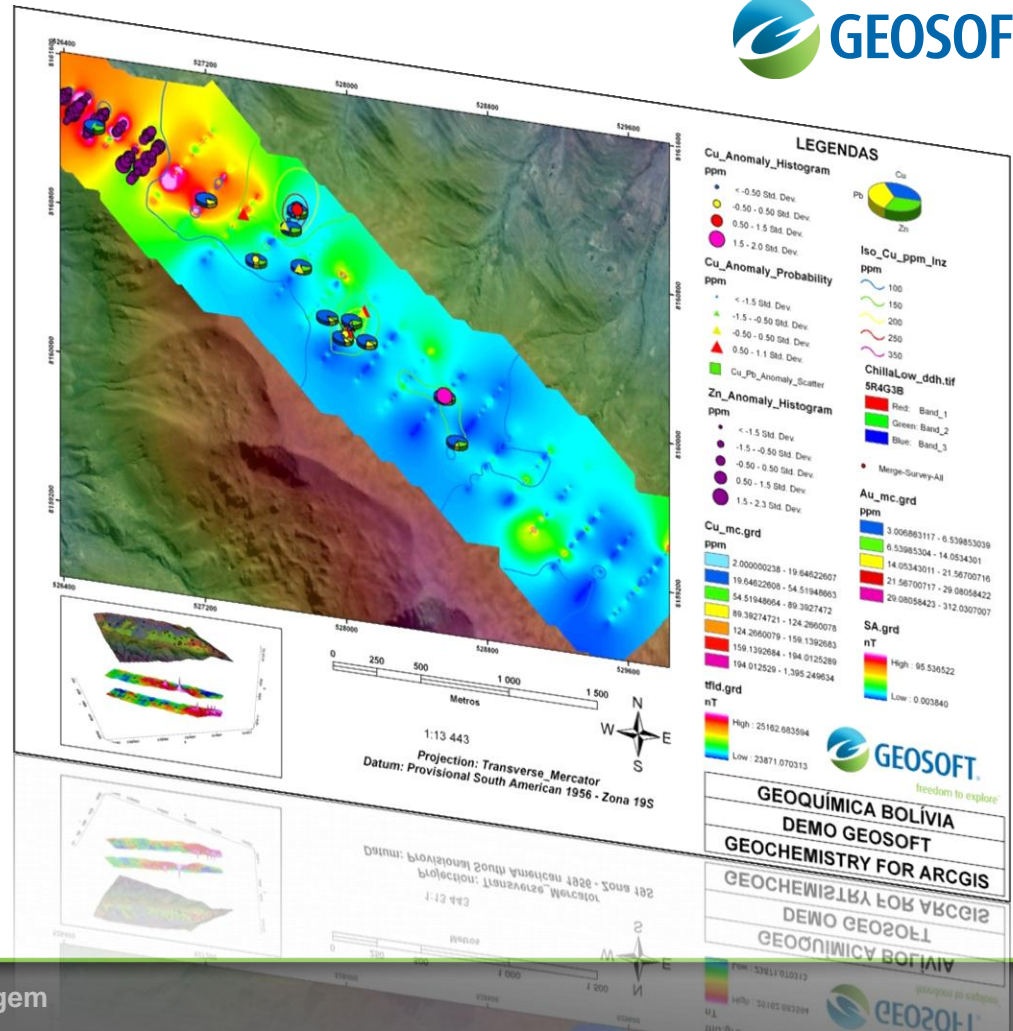
- **Boxplot**



- **Relatórios de Correlação**

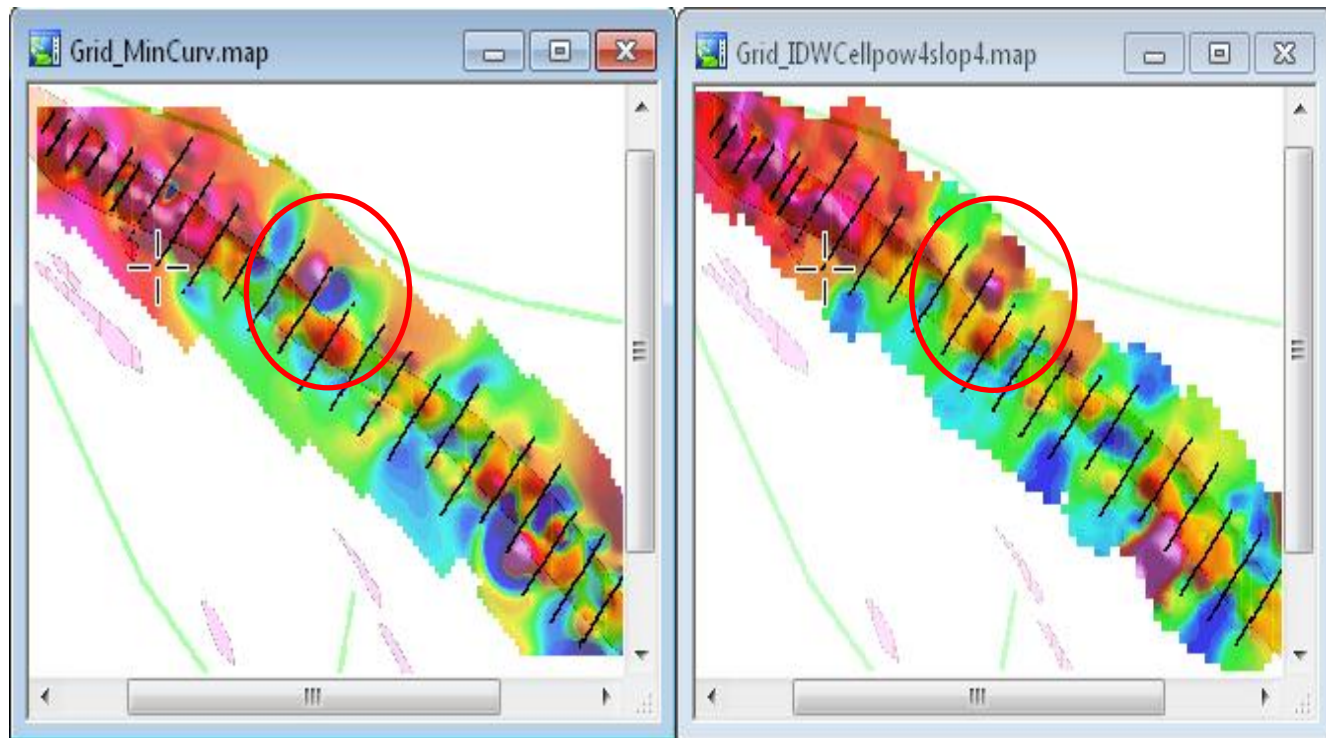


- Ferramentas avançadas de plot em mapas 2D
- Construção completa de mapas para análise e interpretação

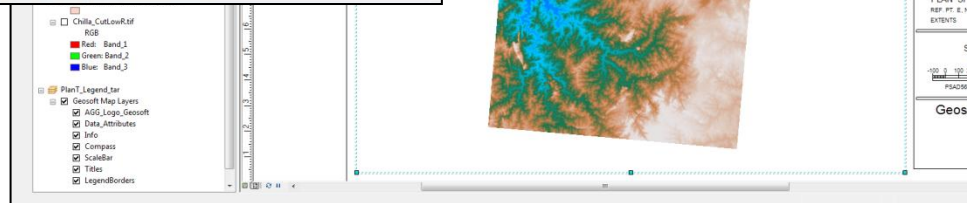
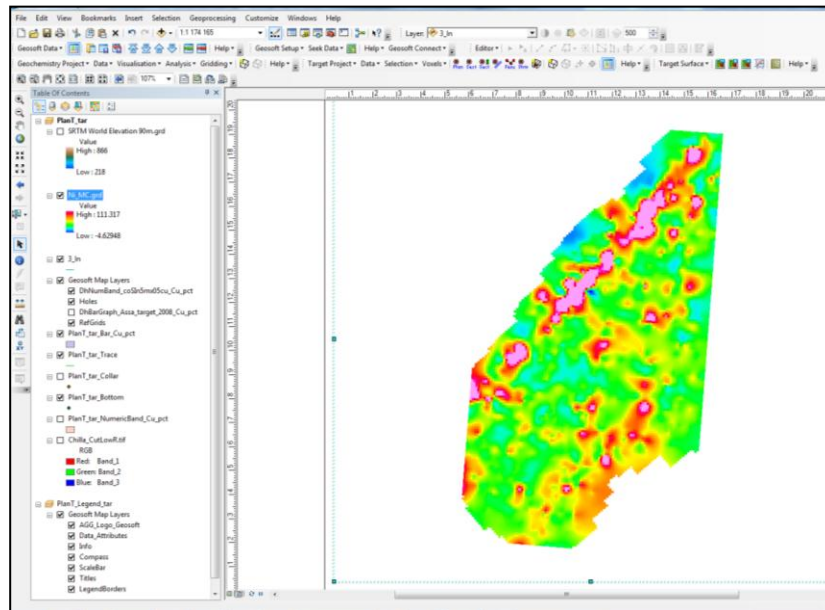


- **Algoritmos de interpolação**
 - Kriging Direcional
 - Mínima Curvatura
 - Inverso da Distância Ponderada

- **Isolinhas**



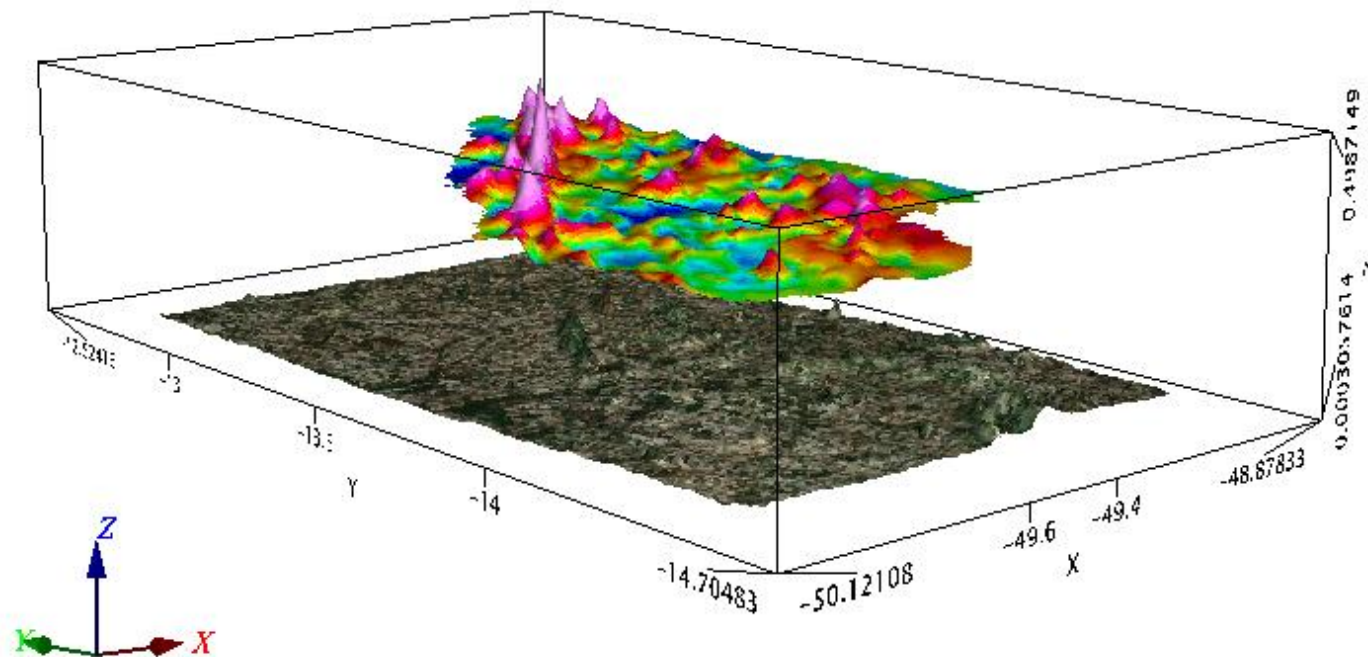
- **Modelo Digital de Elevação**



Terceira Enquete



- **Mapa 3D**

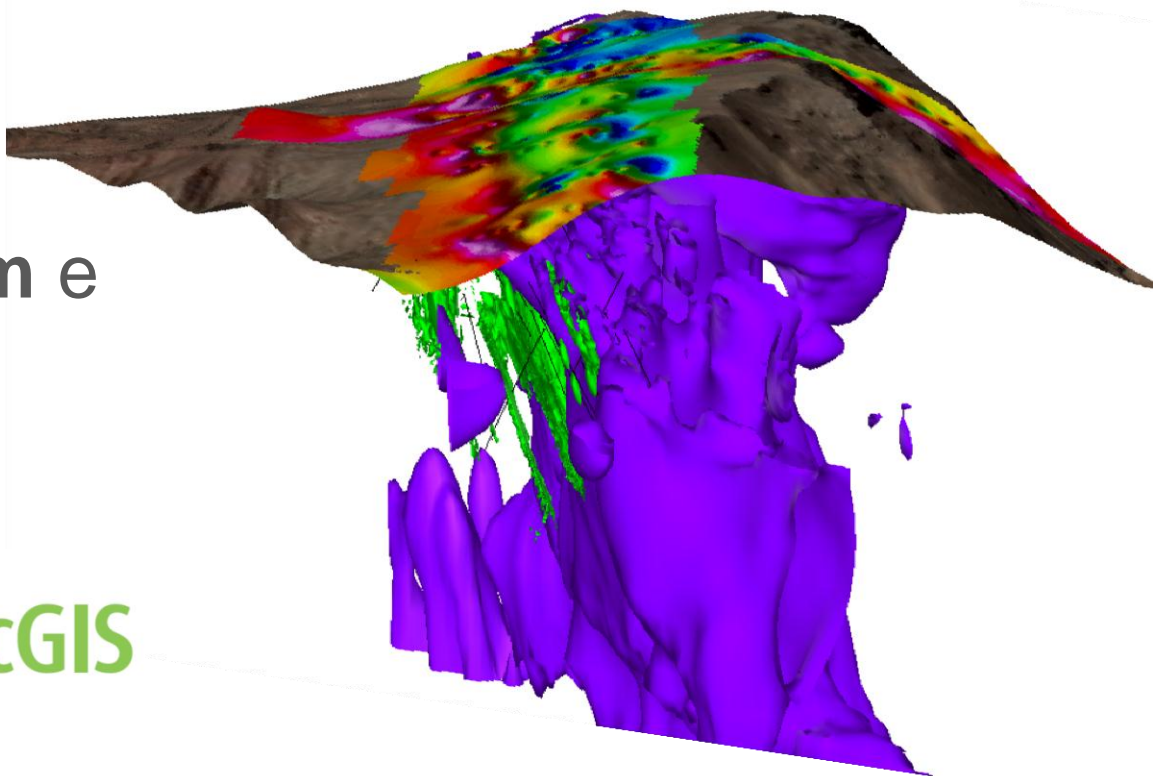


Demonstração de Geochemistry for ArcGIS



É possível integrar
dados de **Sondagem e**
Geofísica
com a ferramenta

 **Target for ArcGIS**





Respondendo suas Perguntas

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



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